
WOMEN IN STEM,
QUO VADIS?
&
HOW TO SURVIVE AS
A SCIENTIFIC COMMUNITY
PANEL: SPOT ON UKRAINE

AGENDA

Tetiana Shkoda, Prof. at Kyiv National Economic University named after Vadym Hetman, Project Manager of the young scientists project “Realization of potential of young scientists in integration of science, education, business”
“Comparative analysis of women - young scientists’ activity in STEM and non-STEM sectors of Ukrainian science in pre-war”

Nataliia Harashchenko, President of The Club of Economists NGO (Ukraine, Kyiv), Coordinator of Working Group 3 «Economic Cooperation, Free Trade Area, Cross-Border Cooperation» of the EU-Ukraine Civil Society Platform, Associate Professor at KNEU named after V. Hetman, PhD.

Lidiia Hladchenko, Key expert of the Club of Economists NGO (Ukraine, Kyiv), Associate Professor at the Kyiv National Economic University named after Vadym Hetman, PhD.
“STEM female Ukrainian researchers in the time of war”

Oleksandra Yeremenko, Prof. at Kharkiv National University of Radio Electronics
"***Kharkiv Information & Communication Technologies ACM-W Chapter: STEM-women unity, support, and volunteering during wartime***"

Daria Koucherets, Rector of the University of AI and digitalization, doctor, professor.
“Woman’s STEM Army - possibility to ensure the continuous development of Stem laboratories in Ukraine during the war”

Comparative analysis of women - young scientists' activity in STEM and r STEM sectors of Ukra science in pre-war

Tetiana Shkoda

YOUTH_SCIENCE
EMPOWER YOUR POTENTIAL

Project “Realization of potential of young scientists in integration of science, education, business”

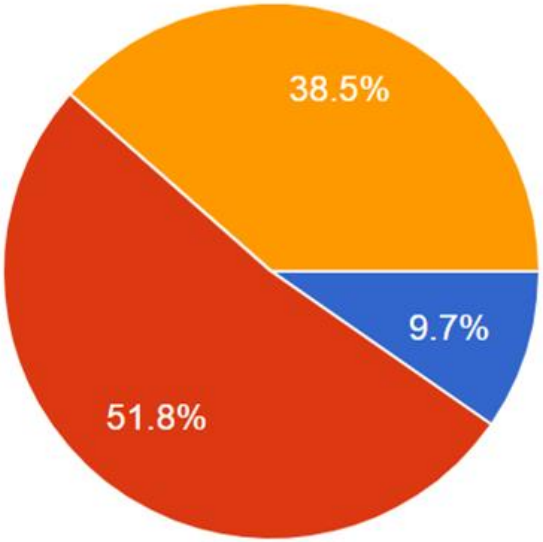
YOUTH_SCIENCE
EMPOWER YOUR POTENTIAL

Project “Realization of potential of young scientists in integration of science, education, business” (2020 – 2022), state registration № 0120U102126

- The **best young scientists’ scientific project’ 2020** in the nomination “Scientific project” in the competition of the Young Scientists Council of Ukraine
- It was conducted a mass sociological survey on the current state of realization of the potential of young scientists (in science, education, business and socio-political sphere) using google-form in 2020. The profile of the modern young scientist in Ukraine is prepared based on the results of this survey.

Scientific degree of respondents

579 responses



- Doctor of sciences
- PhD
- Without scientific title

YOUTH_SCIENCE
EMPOWER YOUR POTENTIAL

Field of your scientific interests?

Sectors	Scientific degree, %		
	Doctor of sciences	PhD	Without scientific degree
NON-STEM			
Humanities: Linguistics, Philology, Literary Studies, Culturology, Pedagogy, Psychology, History, Art Studies, Ethics, Aesthetics	3,4%	49,2%	47,5%
Social sciences: Sociology, Social psychology, Law, Political science, Political economy, Demography, Social statistics, Social hygiene	17,5%	55,3%	27,2%
STEM			
Natural: Physics, Chemistry, Biology, Astronomy, Geography, Geology, Engineering	5,7%	56,9%	37,4%
Formal sciences: Mathematics, Logic, Cybernetics, Statistics (probability theory), Theoretical computer science, Information theory	3,4%	55,2%	41,4%

Do you consider yourself a breadwinner in the family?

Sectors	%	
	Yes	No
NON-STEM		
Humanities: Linguistics, Philology, Literary Studies, Culturology, Pedagogy, Psychology, History, Art Studies, Ethics, Aesthetics	28,0	42,4
Social sciences: Sociology, Social psychology, Law, Political science, Political economy, Demography, Social statistics, Social hygiene	26,2	47,6
STEM		
Natural: Physics, Chemistry, Biology, Astronomy, Geography, Geology, Engineering	17,9	54,5
Formal sciences: Mathematics, Logic, Cybernetics, Statistics (probability theory), Theoretical computer science, Information theory	37,9	37,9

The main problematic issues of realizing the potential of young scientists-women in STEM sector of Ukraine in pre-war:

- **THE MOST IMPORTANT FACTORS OF INFLUENCE ARE SCIENTIFIC INTEREST AND PROSPECTS TO MAKE A SCIENTIFIC CAREER** - for 59.7% of respondents the choice of field of knowledge, specialty and research topic was the influenced by these factors and only for 13.5% - to gain a good profit. About 25,7% of young scientists-women in STEM sector have part-time job
- BAD FINANCIAL SUPPORT – 2% of young scientists of STEM sector have an income of over 19 thousand UAH; 17% - up to UAH 5,000; 32% - from 5 to 9 thousand UAH; 8% - from 09 to 13 thousand UAH
- Average level of knowledge of one foreign language and for 21% is the reason of non-applying for foreign grants, about 15% of young scientists-women in STEM have contacts with their foreign colleagues and know their works,
- For continuation of their scientific research only 4% of young scientists-women in STEM were going to working trips abroad and only 15% of young scientists-women in STEM believe that scientific mobility have the strongest impact on the efficiency of their work

YOUTH_SCIENCE
EMPOWER YOUR POTENTIAL

The main problematic issues of realizing the potential of young scientists-women in STEM sector of Ukraine in pre-war:

- **LOW STATUS OF YOUNG SCIENTIST - 54.2% OF RESPONDENTS UNSATISFACTORY ASSESSED SOCIAL STATUS OF YOUNG SCIENTIST IN UKRAINE**
- **BUREAUCRATIZATION OF THE GRANT APPLICATION PROCESS - 52.65%** of respondents primarily expect a decrease in the level of bureaucratization of the process of applying for state scholarships and grants, increasing the level of openness of competitions for their receipt
- **LOW LEVEL OF COOPERATION WITH BUSINESS – 58,75%** of young scientists-women in STEM don't have the experience of cooperation with business. About 61,5% of young scientists-women in STEM have their own idea for startups, but only 5,9% realize this idea
- **Low level of scientific publications in SCOPUS, Web of Science**
- There is a constant lack of time and necessity of more support from management in its endeavors and career development

YOUTH_SCIENCE
EMPOWER YOUR POTENTIAL

The most effective ways of promoting own researches of young scientists-women

- Participation in conferences and forums – 73,15% for NON-STEM sector and 76,25% for STEM sector
- Publications in journals – 57,4 % for NON-STEM sector and 62,55% for STEM sector
- Publication of own monographs, work books, study books – 45,3% for NON-STEM sector and 25,45% for STEM sector
- Internet-projects on scientific, social and technical topics – 37,85% for NON-STEM sector and 35,4% for STEM sector
- Competitions of scientific works – 32,6% for NON-STEM sector and 44,05% for STEM sector
- Social networks – 53,05% for NON-STEM sector and 45,5% for STEM sector

Soft Skills of young scientists-women in STEM and NON-STEM sectors of Ukraine in pre-war

Young scientists-women defined **as most developed** (got the maximum 5 points) **such soft skills:**

- **Communicability – 54,3% for NON-STEM sector and 44,5% for STEM sector**
- **Team work – 49,1% for NON-STEM sector and 51,2% for STEM sector**
- **Creativity – 48,5% for NON-STEM sector and 39,6% for STEM sector**

YOUTH_SCIENCE
EMPOWER YOUR POTENTIAL

Soft Skills of young scientists -women in STEM and NON-STEM sectors of Ukraine in pre-war

The most pressing issues that require a high level of soft skills of young scientists-women are:

- doing an effective cooperation with business (90% of young scientists have confirmed);
- effective grant and project activities (only every 6th young scientist-woman applied for an individual research grant).

More than 50% of young scientists-women in NON-STEM sector and 45% of young scientists-women in STEM sector emphasize that there is a need to develop their soft skills in professional activity.

YOUTH_SCIENCE
EMPOWER YOUR POTENTIAL

Contact

Tetiana Shkoda, Doctor of Economic Sciences, Professor of Business Economics and Entrepreneurship Department of Kyiv National Economic University named after Vadym Hetman, project manager of the best young scientists' scientific project in Ukraine (2020), team member of ITE-VET (2016-2018) and PAGOSTE (2020-2023) Erasmus+ projects.

shkoda-tetiana@kneu.edu.ua

Scientific profiles

Publons

Scopus

Google Academy

UAScience.Reload

UKRAINIAN SCIENTISTS SUPPORT PROJECT

The Project aims to raise global community awareness of the threats for Ukrainian scholars, and support those who are in need

Nataliia Harashchenko
PhD, Associate Professor at the KNEU named after V. Hetman,
President of the Club of Economists NGO

Lidiia Hladchenko
PhD, Associate Professor at the KNEU named after V. Hetman,
Key expert of the Club of Economists NGO

Information about Survey

- Aims at defining the needs of scientists in Ukraine, and those who temporarily left Ukraine because of war
- Held from April, 1st until May, 2nd 2022
- 2173 Ukrainian scientists participated
- Online with use of LimeSurvey platform
- Questionnaire covered 38 questions and included general information about respondent, questions about personal needs and needs relevant to research activity

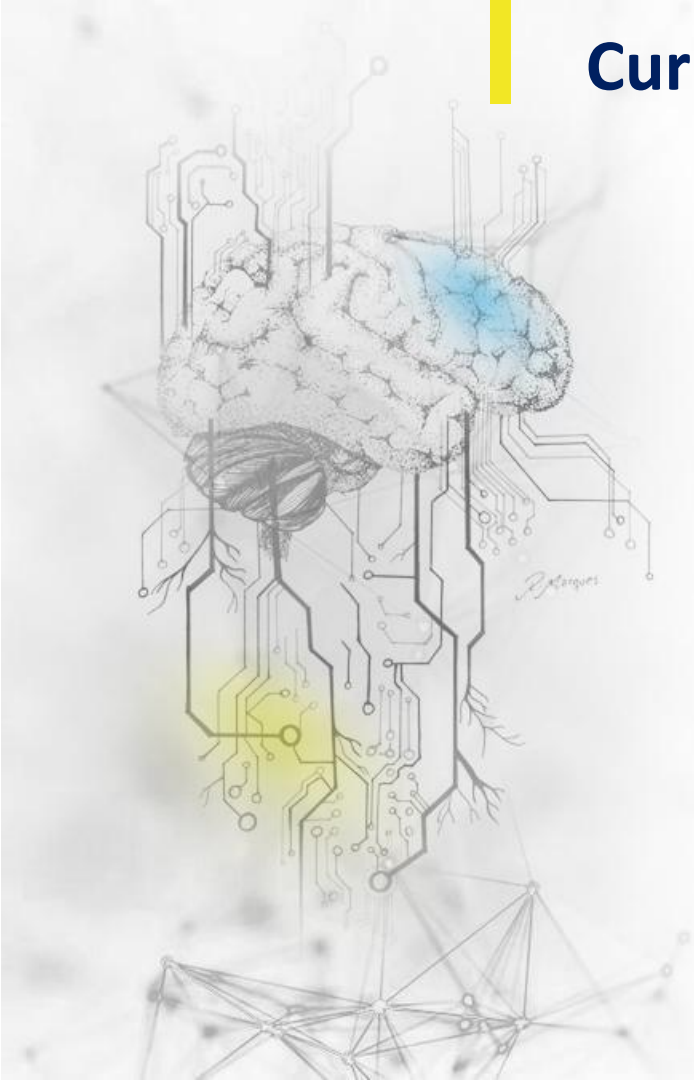
Ukrainian scientists portrait

- There were 32,9% men and **67,1% women** among respondents
- The most numerous age groups: 31-40 years (29,3%) та 41-50 years (30,5%)
- 30,3% scientists out of all respondents do not have children, 38,1% respondents have one child, and 27% respondents - 2 children
- 53,9% out of scientists with children have adult children
- 42.8% of respondents have relatives in need of special care (e.g., people with disabilities, the elderly, etc.)

Ukrainian scientists portrait

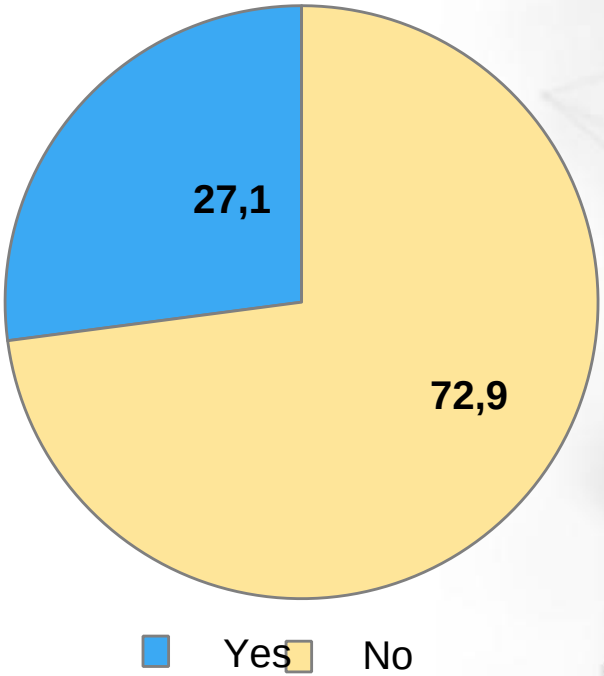
- 53.7% of Ukrainian scientists are university staff (by main place of work), 32% of respondents are researchers at research institutions (by main place of work)
- 63.4% of respondents work in state higher education institutions, 22.6% of respondents - in research institutes of the National Academy of Sciences of Ukraine
- 74,4% of scientists are not engaged in activities other than research and /or teaching and research
- 81.1% of respondents continue to receive a salary in the institution (institutions) where they work
- 83.8% of respondents say that their financial situation has deteriorated compared to pre-war times

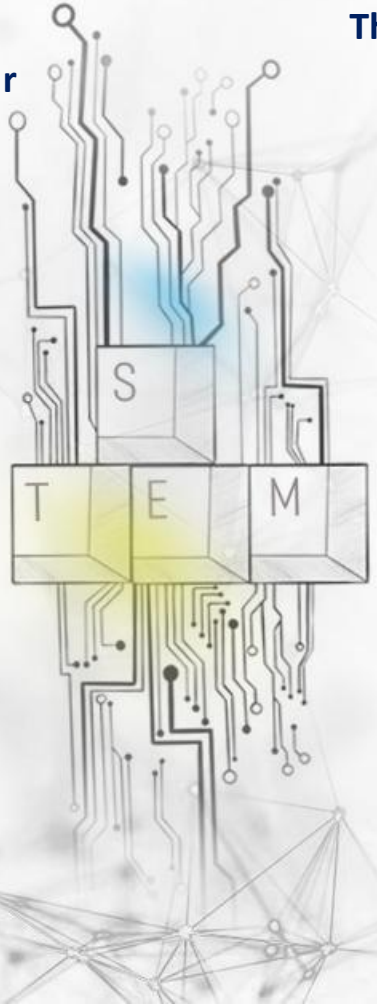
Current location of scientists



- 47.2% of respondents staying in Ukraine have not changed their place of residence due to the war. 38.1% of scientists in Ukraine have changed their place of residence due to the war, 14.7% of scientists are abroad
- Most scientists in Ukraine are in Kyiv (19.9%), Cherkasy (10.6%), Lviv (9.9%), Kharkiv (9.7%), Vinnytsia (5.7%) regions
- 53.7% of scientists staying in Ukraine live in locations with no hostilities, 7% of scientists - in areas of hostilities
- Most Ukrainian scientists abroad are in Germany (26.8%) and Poland (25.1%).

Is it possible to be engaged in research activities to the same extent as in pre-war times? (%)

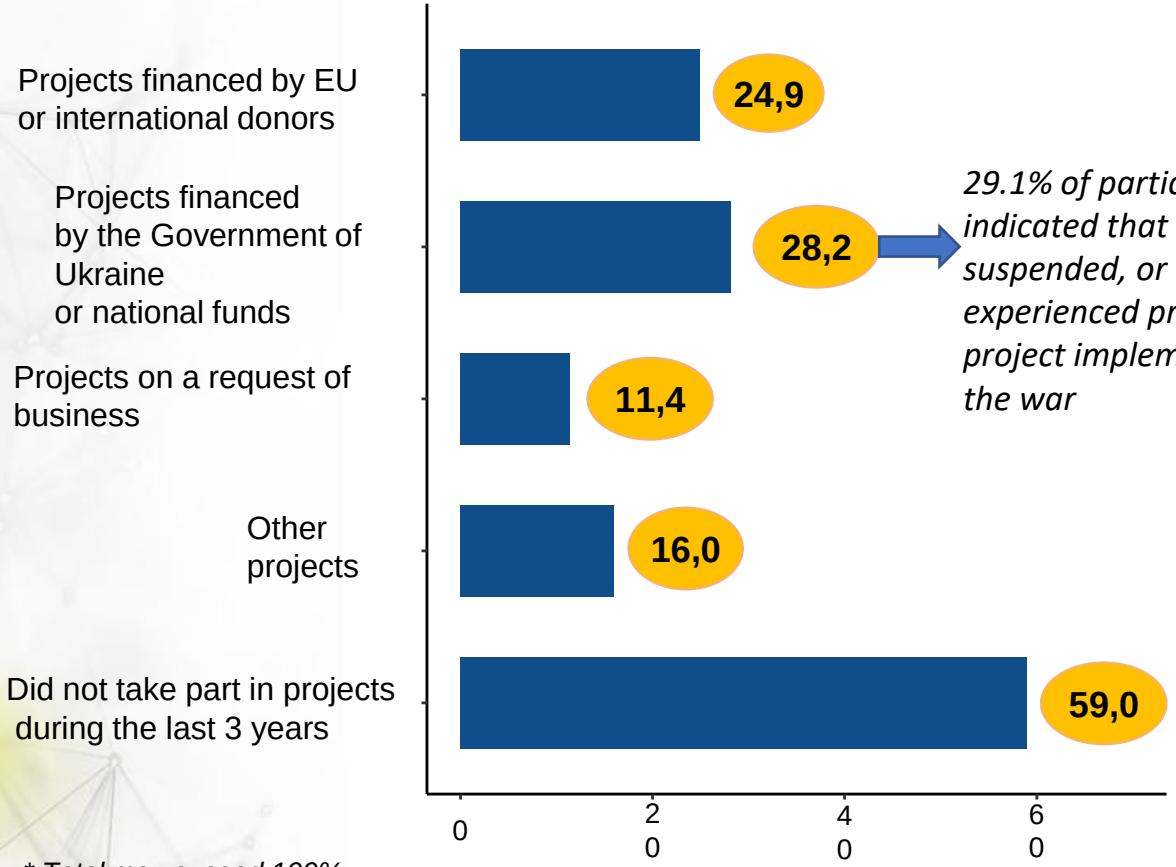




The main reasons for the inability to be fully engaged in research activities:

- I don't feel safe, which hinders me from working
- The specifics of my work imply my presence at the workplace, and I do not have such an opportunity
- Technical reasons: constant interruptions with the Internet and communication, turning off the lights, etc.
- Lack of interest, apathy

Participation in grant or competition projects during the last three years (%)



29.1% of participants indicated that their projects were suspended, or they experienced problems with project implementation due to the war

** Total may exceed 100%*

The strongest personal needs

Ukrainian scientists

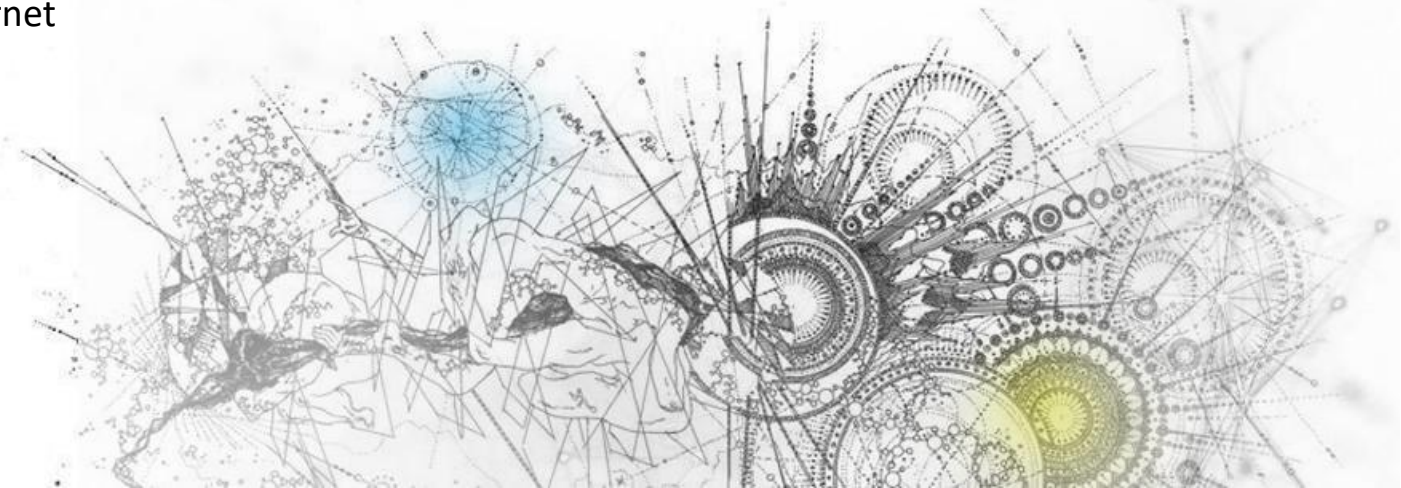
- Financial support
- Reestablishing / building of new social contacts
- Stable/ uninterrupted Internet access

Ukrainian scientists (female)

- Reestablishing / building of new social contacts
- Financial support

Ukrainian scientists (female) in STEM

- Financial support
- Reestablishing / building of new social contacts



The strongest needs in research activity

Ukrainian scientists

- Research projects to be engaged in the near future
- Access to scientific literature
- Communication with the research teams / colleagues
- Mobility programs for scientists
- Research projects to be engaged in right now
- Access to information and data

Ukrainian scientists (female)

- Research projects to be engaged in the near future
- Access to scientific literature
- Mobility programs for scientists
- Communication with the research teams / colleagues
- Access to information and data
- Research projects to be engaged in right now

Ukrainian scientists (female) in STEM

- Research projects to be engaged in the near future
- Research projects to be engaged in right now
- Access to research equipment and laboratories
- Communication with the research teams / colleagues
- Access to scientific literature
- Mobility programs for scientists
- Licensed software required for research
- Access to information and data

UAScience. Reload Project

Initiated by Kyiv Academic University, Yuriy Fedkovych Chernivtsi National University, Kyiv National University named after Taras Shevchenko, The Club of Economists NGO, Kyiv National Economic University named after V. Hetman, Agency of European Innovations NGO, National University “Kyiv-Mohyla Academy”, Institute of Mathematics of NASU, Ukrainian Emerging Leaders Program, University of Utah Health, National Research Foundation Of Ukraine, National Erasmus+ Office in Ukraine & HERE team, Charitable Foundation “Intelektualna Perspektyva” and other

Contact Info:

info@uascience-reload.org

anastasiia.a.lutsenko@gmail.com

https://www.uascience-reload.org/

Survey Research Team:

Nataliia Harashchenko

PhD, Associate Professor at KNEU named after V. Hetman, President of The Club of Economists NGO

Lidiia Hladchenko

PhD, Associate Professor at KNEU named after V. Hetman, Key Expert of The Club of Economists NGO

Nadiia Korytnikova

PhD in Sociology, Associate Professor, Department of Methods of Sociological Research, Faculty of Sociology, V. N. Karazin Kharkiv National University

Anastasiia Lutsenko *

Cand. PhD in Innovation, Associate Professor at Monarch Business School, Scientific coordinator and project lead at KAU NASU, Visiting Researcher at Max Planck Institute for Innovation and Competition

Ruslana Moskotina

PhD in Sociology, Taras Shevchenko National University of Kyiv, Faculty of Sociology, Laboratory of Applied Sociological Research

Oleksandra Pravdyva

Master in International Economics, Key Expert of The Club of Economists NGO

** Team coordinator and contact person*

Kharkiv Information & Communication Technologies ACM-W Chapter: STEM-women unity, support, and volunteering during wartime

Oleksandra Yeremenko
Kharkiv National University of Radio Electronics

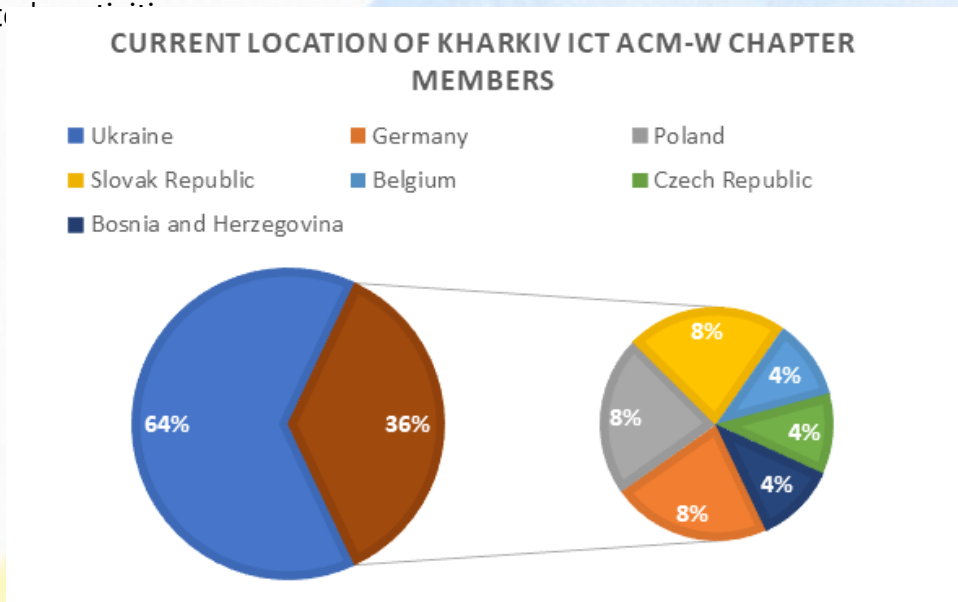
Kharkiv ICT ACM-W Chapter:
STEM-women unity, support, and volunteering in the wartime

2020 – Establishment of the Kharkiv ICT ACM-W Chapter

Kharkiv ICT ACM-W Chapter operates exclusively for educational and scientific purposes to promote the growth of knowledge and interest in *science and technology, design, programming, and any application of modern computing*. In addition, it is a *platform for communication between professionals and educators, youth and students* interested in the chapt

Outcomes:

- significant support during isolation;
- seclusion overcoming;
- work style change;
- networking;
- collaboration;
- boundaries erasing;
- participating in conferences;
- volunteering at events;
- consulting STEM-women.



Kharkiv ICT ACM-W Chapter:
STEM-women unity, support, and volunteering in the wartime

Wartime ongoing projects:
Erasmus+ project Jean Monnet module: “Integrating the EU cybersecurity framework and policies in Ukraine” (CYFRA)
Module courses (more than 60 participants all over Ukraine in Spring - Summer 2022):

- *EU framework for exchanging cybersecurity information*
- EU best practices: cyberattack detection and analysis with machine learning
- EU best practices and strategy for cyber resilience
- *EU best practices for IoT and Smart Infrastructures*

CERT-UA
Computer Emergency Response Team of Ukraine

Ukrainian STEM-women should consolidate their efforts and help each other and our Motherland. We know how to organize the most **vital workflows:**

- functioning of critical information infrastructures;
- organization of alerting the population in case of danger;
- reliability and continuity of essential communication services;
- counteracting cybersecurity threats;
- information hygiene, and much more.

Our communication and collaboration are critical in conditions when volunteer assistance can become almost the only one in a crucial situation. Our battlefield is a multidimensional space. We united to make this world a better place at one time, but now we are holding hands in the name of peace on Earth!

Oleksandra Yeremenko, Oleksandr Lemeshko,
Valentyn Lemeshko, Mykhailo Persikov
V.V. Popovskyy Department of Infocommunication Engineering,
Kharkiv National University of Radio Electronics, ***Kharkiv, UKRAINE***

ICT Disruptive Technologies: Starlink in Ukraine Case

Disruptive technologies make fundamental changes in markets and industry and are vital in provisioning critical services.

Starlink is such a technology providing global reliable Internet access that can help restore the destroyed Ukraine territories.

- Disruptive technologies include those that lead to significant changes in a particular sphere or industry by introducing cutting-edge technological solutions to digitalize an individual's living space and the information society.
- Starlink disrupts the telecommunications sector as the most promising communication infrastructure project. In a nutshell, Starlink is a satellite Internet constellation being constructed by SpaceX that aims for global coverage and Internet access.
- Starlink's value is substantial when it is necessary to provide network services under challenging conditions, where network access is unreliable, expensive, or unavailable.

Benefits of Starlink deployment

150,000 active Starlink users in Ukraine
More than 10,000 Starlink terminals are in service (May, 2022)

1. Starlink provides a high-speed internet connection to remote locations in Ukraine and supports end-users in conflict zones where access is unreliable or unavailable
2. Starlink equipment deployed on critical information infrastructures (CII). Terminals have been set up on energy companies, hospitals, and other objects of critical infrastructures
3. Due to the excessive population growth in the western part of Ukraine, Starlink helps prevent the internet infrastructure's overload
4. Starlink access improves reliability and creates backup connectivity for Ukrainians under network outages of essential telecommunications services

The Starlink deployment's main aim is to overcome the communication difficulties in wartime when Internet access is vital but not guaranteed. The use of Starlink allows the creation of backup networking for CII in Ukraine.

STARLINK

womENcourage 2022

ictacmw.acm.org

oleksandra.yeremenko@nure.ua

#GirlsinICT are...

> ***heroes of today***
> ***Innovators,***
> ***Communicators,***
> ***Technologist!***

Oleksandra Yeremenko

Oleksandra Yeremenko

Kharkiv ICT ACM-W Chapter

Kharkiv ICT ACM-W Chapter FB

WOMAN'S STEAM ARMY

possibility to ensure the continuous development of Steam laboratories in Ukraine during the war

Daria Koucherets - Doctor, Professor, Rector of the University of AI and Digitalization

University of AI
& digitalization

The University of AI and Digitalization

is an educational institution that uses STEAM education to train future IT and AI innovators to create a strong and independent country built on high technology.

University of AI & digitalization

BEFORE / AFTER THE WAR

Before the war, Ukrainian educational institutions annually:

- Produced 20,000 thousand new IT specialists;
- Market needs were more than 35,000 thousand per year;
- The Ukrainian labor market needs were ~ 15,000 specialists per year;

- **Post-war** growth is expected to reach 40,000 thousand per year.(REF Ministry of Digital Transformation)

440
21632
261201
221220
948381
9898
777

University of AI
& digitalization

UNIVERSITY AI APPLIES STEM TO MULTIPLE EDUCATIONAL LEVELS

- Postgraduate education (advanced training);
- University (bachelor's, master's, postgraduate);
- College;
- Vocational and technical education

University of AI & digitalization

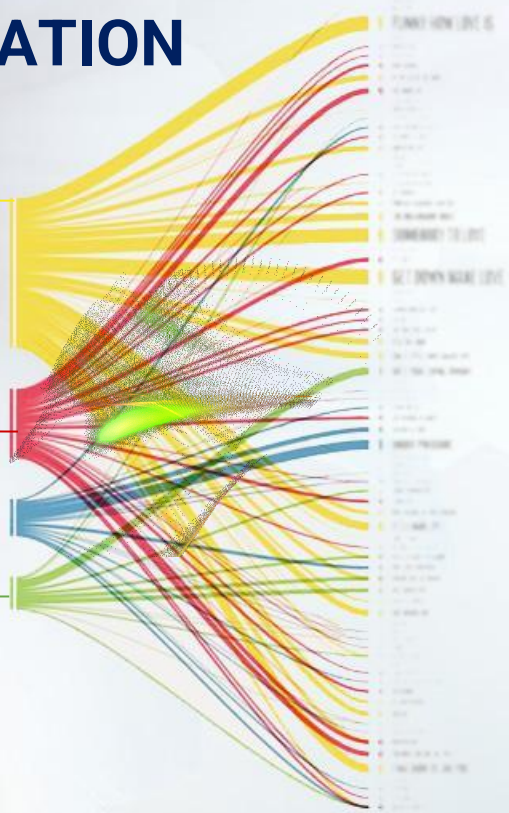
TIMELINE OF FORMING STEM LAB UNIVERSITY OF AI AND DIGITALIZATION

an order was placed for 15 copies of the latest Edue-Tech innovations for AI, IoT, Data Science, Machine learning

1 day before the war

opening of STEM Lab **2021**

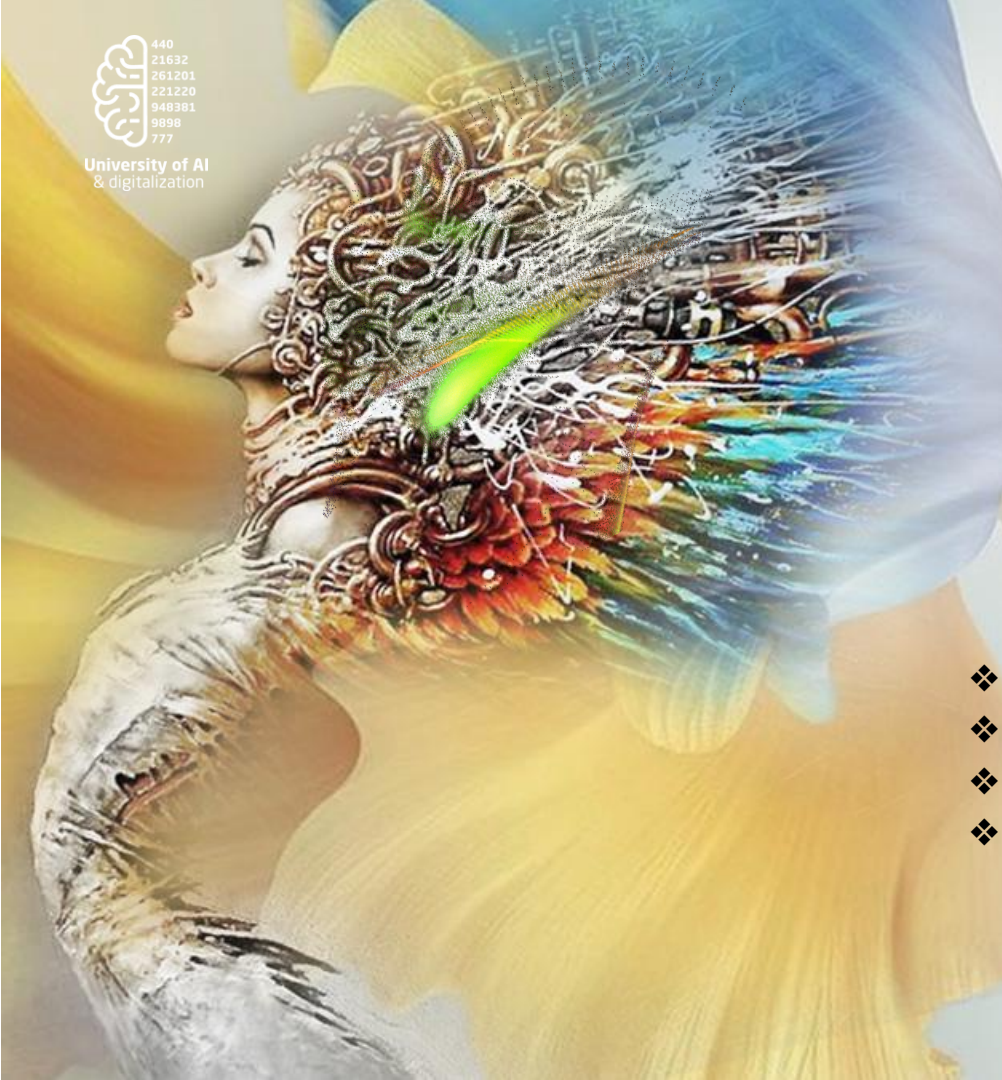
year of establishment of the University **2020**



THE LATEST EXPERIENCE OF COMPLETING STEM LAB WITH UNIVERSITY OF AI AND DIGITALIZATION

- Invested 2 years in the implementation of edurobots into educational programs;
- Evaluated more than 200 samples;
- Translated hundreds pages of methodical recommendations into Ukrainian;
- Localized softwares to Ukrainian;
- Passed certification to use edurobots in educational programs in September 2021;
- Trained 4 teachers, including 2 women;
- Integrated into educational programs of all levels;
- Implemented in cross-disciplinary educational programs such as "Data-science and digital management";
- Applied in various specialties such as law, economics, IT.

University of AI & digitalization



CHALLENGES OF THE STEM LAB BECAUSE OF THE RUSSIA`S ATTACK

- Lack of funds;
- Restriction of access to equipment in laboratories;
- Lack of new samples due to import logistics;
- The male population involved in the war and women are dispersed.

University of AI & digitalization

A VISION THAT CAN HELP

- Assist in providing grant programs for Ukrainian Universities to fund STEAM Lab;
- Conclude cooperation agreements between Ukrainian and foreign educational institutions where teachers and students can have access to similar laboratories abroad;
- Support integrations with the various international STEAM associations in multiple ways;
- Assist in creation of the international STEAM competitions for higher education levels.

Woman's STEAM Army - possibility to ensure the continuous development of STEM laboratories in Ukraine during the war.

University of AI & digitalization

THE FORCES OF EXPERIENCE

University of AI become a visioner and uniter of academic scientific community

through the organization on the Competition Young Scientist of the Year in the platform of Young Scientists Council of Ukraine

МОЛОДИЙ ВЧЕНИЙ РОКУ

377 days to organize from idea to realization

1300 submitted applications

100 nominations and winners

582,846
site views in one month

357,282
site visits from a unique IP address

39
representatives from multiple high education organizations provided support

24
representatives from multiple high education organizations provided support

3
academic organizations have joined forces

0
advertisement cost

440
21632
261201
221220
948381
9898
777

University of AI
& digitalization

Ukrainian women at STEAM are ready to cooperate at a high level!

LET`S DO IT!

Contact

ai-university.com.ua

Facebook

Wikipedia

University AI and Digitalization

ai.of.university@gmail.com

Phone number: +38 (098) 200 9191

Rector FB

Rector LinkedIn

Wikipedia

Phone number +1 425 517 97 89 / +3 8 068 505 98 98


THANK YOU VERY MUCH
FOR YOUR ATTENTION
PRAY FOR UKRAINE