

University professors and lecturers delivering physics lessons to schoolchildren at the STEM Center in Kharkiv. PHOTO: AUTHOR

PERFORMING EDUCATION AGAINST ALL ODDS

Experiences from H. S. Skovoroda Kharkiv National Pedagogical University

There are many difficulties and challenges for higher education in war zones. Rector Yurii Boichuk and Vice-Rector Volodymyr Borysov, at H. S. Skovoroda Kharkiv National Pedagogical University in Kharkiv, have personal experience of providing education against all odds. They describe how they have been organizing the educational programs at their university; Yurii Boichuk presents the work with strengthening the education for Children with Special Needs (SEN) and Volodymyr Borysov describes the importance of providing both online and offline education in times of war.

The educational and scientific laboratory of special and inclusive education

In 2024, the university staged a successful international cooperation with the United Nations Children's Fund (UNICEF) with the project "Strengthening inclusive education for children with special educational needs, in particular children with disabilities, in the Kharkiv region"(UKR/PCA2024395/PD2024482). It was aimed at creating a safe, barrier-free, and comfortable educational environment for children with Special Educational Needs (SEN) in the Kharkiv frontline region, in order to support children in their development and socialization. Because of the war, in recent years there has been a tendency toward an increase in the number of children with special educational needs in Ukraine. This is due to the consequences of the war, the impact of environmental and social factors on health, and increased effectiveness in diagnosing psychophysical disorders.

The listed factors have caused physical and psychological trauma to a significant number of children, who consequently require corrective and developmental assistance. In the context of such changes, it is important not only to expand opportunities for inclusive education, but also to ensure that specialists are trained who are capable of working effectively with children with SEN using modern methods and technologies. High-quality training of future specialists in the field of special and inclusive education is impossible without practical mastery of modern technologies for corrective and developmental assistance.

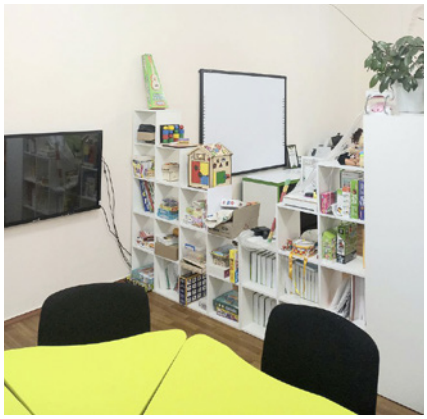
FOR THIS PURPOSE, the Educational and Scientific Laboratory of Special and Inclusive Education was created as a structural unit within the Department of Special Pedagogy at H. S. Skovoroda Kharkiv National Pedagogical University's Faculty of Natural, Special and Health Education. UNICEF helped to equip the laboratory. Its main tasks are:

1. Developing practical skills for university students majoring in 016 "Special Education" when providing corrective and developmental assistance to children with special educational needs.
2. Mastering modern technologies that support psychological and pedagogical activities and interaction between students.
3. Obtaining experimental material by students in the specialism "Special Education" for use in writing bachelor's and master's qualification works and conducting research.
4. Carrying out consultative and educational activities for parents of children with SEN.
5. Providing methodological assistance to educational institutions offering inclusive education, and to special educational institutions in the Kharkiv region, in order to offer a wide range of services to children and their families.
6. Developing educational content for teachers who provide corrective and developmental services to children with special educational needs.
7. Holding seminars, courses, and round tables with students, teachers, and lecturers in order to develop the inclusive competence of inclusive education specialists.
8. Developing methodological recommendations for organizing work with children with special educational needs in pre-school and general secondary (special) educational institutions.

THE MAIN FUNCTIONS of the laboratory are:

1. Studying, summarizing, and disseminating national and international experiences in the field of providing educational and corrective developmental services to children with special educational needs; developing the regulatory and legal framework for innovative pedagogical activities; and familiarizing education workers in the Kharkiv region with this framework.
2. Providing scientific, methodological, and organizational support for experimental pedagogical research in pre-school and general educational institutions in the Kharkiv region.
3. Exercising general control over the progress of experimental pedagogical research at the regional level in Kharkiv.
4. Providing corrective and developmental services and classes to children with special educational needs.
5. Providing consultations to parents of children with special educational needs on issues of development, education, and upbringing in the family environment.
6. Offering scientific and methodological support for advanced training courses for students, teachers, and lecturers at pre-school and general educational institutions in the Kharkiv region that deliver educational, corrective, and developmental services to children with special educational needs.
7. Organizing, coordinating, and conducting scientific and practical conferences, seminars, round tables, etc. on the problem, preparation, and publication of scientific, methodological, and informational publications.
8. Cooperation with international organizations, as well as with the National Academy of Pedagogical Sciences of

"BECAUSE OF THE WAR, IN RECENT YEARS THERE HAS BEEN A TENDENCY TOWARD AN INCREASE IN THE NUMBER OF CHILDREN WITH SPECIAL EDUCATIONAL NEEDS IN UKRAINE."

Laboratory equipment for children with special educational needs. PHOTO: AUTHOR




Laboratory equipment for parents, teachers, and lecturers who care for and work with children with special educational needs. PHOTO: AUTHOR

Ukraine, different national research institutes, institutions, and higher educational institutions, the Kharkiv Academy of Continuing Education, and the All-Ukrainian Association of Correctional Teachers.

THE LABORATORY was equipped with special tools (see above) for the correction of the psychophysical development of children with special educational needs within the framework of the implementation of the United Nations Children's Fund (UNICEF) project "Strengthening inclusive education for children with special educational needs, in particular children with disabilities, in the Kharkiv region" (UKR/PCA2024395/PD2024482).

Result of the laboratory work

During 2024–2025, information about 5,522 children with SEN was collected and analyzed, including for the age groups 0–5, 6–18, and 18+. This information was analyzed in the following areas: location, type of education, categories of difficulty, access to services, service needs, and parents' willingness to participate in programs.

Seven professional development programs were developed by the university for teachers, including teachers of the deaf, teachers of the blind, speech therapists, and special education teachers (remedial psychologists, teachers of the mentally disabled, psychologists, physical education teachers specializing in rehabilitation, etc.). 140 teachers were trained in frontline communities in Kharkiv, and 586 specialists took part in training sessions at the laboratory (see above).

The university developed master's programs to train specialists to work with children with these needs. In 2024–2025, 140 master's applicants enrolled in the specializations 016 Special Education and 053 Psychology. The educational programs "Education of the visually impaired. Education for the deaf and hard of hearing" and "Rehabilitation Psychology" were developed. Seven programs were developed for working with children with various categories of educational difficulties. 12,945 classes were aonducted for children with SEN, with 320 children receiving services thanks to the efforts of 123 specialists.

DURING 2024—2025, 496 educational institutions (228 pre-school educational institutions and 268 general secondary educational institutions) were surveyed. Google questionnaires were used, and administrative resources were consulted. An analytical report with detailed statistics and conclusions was prepared by the laboratory. Services using the laboratory's equipment were provided to 1,200 children. Different equipment has been transferred to the educational institutions in 15 Kharkiv communities, and to 5 education departments in the Kharkiv region.

Different programs were provided for parents. Six educational and awareness programs were developed that took into account different types of developmental disorders in children (hearing, vision, speech, intellect, etc.). Some courses were also organized for parents, with 96 online classes (October-November 2024), 84 online meetings (December 2024–June 2025), and 22 offline meetings held with parents in Kharkiv communities. 1,003 parents were involved in meetings. With this, parents gained knowledge of how to better support their children's learning and development at home.

The laboratory work was thus implemented comprehensively, covering all key target groups – children with SEN, teachers, parents, and educational institutions. Significant improvements were achieved in understanding the situation at both the city and regional levels in Kharkiv, ensuring access to quality services, staff training, and specialist equipment for inclusive educational institutions.

Yurii Boichuk is Rector at H. S. Skovoroda Kharkiv National Pedagogical University, Kharkiv, Ukraine.

PHOTO: AUTHOR



Schoolchildren taking lessons in biology, physics, and chemistry. Spring 2025, a series of online classes designed to help students prepare for university entrance exams was delivered at the Skovoroda Hub in the shelter of the main building of H. S. Skovoroda Kharkiv National Pedagogical University.





University lecturers holding classes in shelters and basements at Kharkiv lyceums #162 and #153.

The Skovoroda Hub and the STEM Center

Offering education both online and offline

The Skovoroda Hub

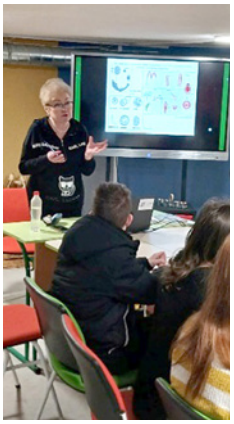
The Skovoroda Hub is a free educational environment created for all learners at H. S. Skovoroda Kharkiv National Pedagogical University, in Kharkiv, Ukraine. The Skovoroda Hub began operation on February 2, 2023. The idea for its creation arose during the Russian-Ukrainian war because of the need for online education. From the very beginning, the hub has been an environment that combines the work of our lecturers, professors, and speakers with modern digital technologies. The hub uses Google platforms to develop its website; Telegram, WhatsApp, and YouTube accounts to disseminate information; and Zoom and Google Meet to hold online classes.[1] Initially, only schoolchildren were invited to the hub. The hub began by working exclusively online because of the security situation in Kharkiv. However, "STEM education for all" later began working offline with schoolchildren in the university's bomb shelter, providing offline classes held under the title "STEM education. Physics, chemistry and biology offline".[2]

The hub now operates in several areas, providing schoolchildren from local communities in the Kharkiv region with the opportunity to acquire new knowledge and skills. University specialists conduct methodological and educational seminars, workshops, lectures, and training sessions on a variety of topical issues. All activities are reflected on the hub's website, where information is constantly updated and disseminated through social networks.[3]

IN 2025 THE SKOVORODA Hub website[4] demonstrated stable activity and audience interest, collecting 42,265 views, 5,445 hours of viewing time, 431 new subscribers, and 624,984 impressions with a CTR of 3.7%. This indicates that the content is well indexed and actively consumed through searches, recommendations, and external sources. The most noticeable surge in activity occurred during the exam period in June.The channel is characterized by pronounced seasonality, as is typical of educational content, and the high retention and click-through rates of individual videos highlight the quality of the topics and presentation. Successful videos can serve as a benchmark for creating further content.

A Telegram channel run by the Skovoroda Hub is used to promote the hub's events, with more than 1,000 pupils, students, and teachers from Ukraine, the United Kingdom, Germany, Poland, and France participating.[5] Currently, the subscriber base consists of pupils and students at all levels of higher education; of university staff, school teachers, and employees at H. S. Skovoroda Kharkiv National Pedagogical University; and of ordinary citizens from local communities.[6] The hub was expanded in order to provide an environment in which participants in the educational process – that is, school teachers and university lecturers – have the opportunity to improve their digital skills. University staff and schoolteachers have the possibility to improve their skills in applying digital technologies in the educational process, from working with electronic learning materials to introducing interactive services and digital formats for presenting information. This approach ensured the development of a common digital environment where all participants, regardless of their role, are able to master new tools, increase the effectiveness of their interactions, work with information at a qualitatively new level, and confidently use digital technologies in their daily and professional activities.

In the first half of 2025, a series of meetings titled "Digital Education for





University lecturers holding offline classes at two Kharkiv lyceums.



The Skovoroda Hub demonstrates experiments in physics and chemistry for students at the "Metroschool".

All – From Digital Literacy to Digital Mastery" was held for schoolteachers and university staff. An intensive course was also organized in 2025. The content of the classes was aligned with the school computer science curriculum, and the flexible teaching methodology considered the age characteristics of the participants and was adapted to their needs. The classes were held at the Skovoroda Hub from April to May 2025 in an offline format. Also, as part of the hub's work, in November 2025, lecturers from the Faculty of Foreign Philology held a series of webinars on "Methods of teaching English in mixed-level groups of students". Teachers, lecturers, and students from various educational institutions in Ukraine joined the webinars online, with up to 30 participants attending each event. The webinars covered the advantages and disadvantages of teaching foreign languages in multi-level groups of students; strategies for organizing English language teaching; issues relating to the differentiation of content, process, and learning outcomes; and techniques for adapting teaching materials to the needs of students.

THE MOST POPULAR activity in the hub is preparation for exams. The exams are online tests required for university entrance in Ukraine. The National Multi-Subject Test is used for bachelor's degrees, while the Unified Entrance Examination test is mandatory for all master's degrees. It includes a foreign language test and a general academic competence test (consisting of verbal and logical blocks of professional knowledge in the respective specialism, e.g. law, economics, management). The Unified Entrance Test is a test of research methodology skills and is required for entrance to PhD studies.

During 2025, more than 300 participants from Kharkiv city and the Kharkiv regions (such as Lozovsky, Zolochivsky, Izyumsky), Kryvyi Rih city in the Dnipropetrovsk region, Germany, the Netherlands, Ireland, and other countries joined the preparatory classes in mathematics, Ukrainian, and English for the Unified Entrance Test. More than 100 participants from different cities throughout Ukraine (including Kharkiv, Kyiv, Vinnytsia, and Lviv) joined the preparatory classes for the National Multi-Subject Test covering the Ukrainian language, mathematics, the history of Ukraine, the English language, biology, physics, and chemistry, as well as preparation for writing a motivational letter for applying to university.

"THE MOST POPULAR ACTIVITY IN THE HUB IS PREPARATION FOR EXAMS."

The STEM Center

The term "STEM education" is an abbreviation of science, technology, engineering, and mathematics. Throughout 2025, the STEM Center operated at the Skovoroda Hub at H. S. Skovoroda Kharkiv National Pedagogical University.[7] The STEM Center provided theoretical and practical training for university students in the implementation of STEM education in their professional teaching activities; conducted training courses for scientific, teaching, and pedagogical staff; conducted classes for schoolchildren; and organized and conducted events to promote STEM education (developing and disseminating online content, holding conferences, etc.), as well as developing and testing scientific and methodological support for the implementation of STEM education.

IN ORDER TO PROVIDE theoretical and practical training for university students in the implementation of STEM education in their professional teaching activities, the content of educational programs was improved for training pre-service teachers of mathematics, physics, chemistry, biology, and computer science, for both bachelor's and master's students.[8]

In 2025, the Institute of Postgraduate Education at H. S. Skovoroda Kharkiv National Pedagogical University organized training courses at the STEM Center for supporting teaching staff in the implementation of STEM education. This consisted

of three modules: general training, psychological and pedagogical training, and professional training.[9] A specialized advanced training course for secondary school Computer Science teachers on the topic of STEM technologies in education has also been developed and implemented.[10] The special course program (30 or 18 hours) covered the practical issues of implementing STEM education in secondary schools such as implementing the didactic principles of the "New Ukrainian School" reform or how to employing the latest tools for student activities.

In 2025, under the coordination of the STEM Center at the Skovoroda Hub for blended education,[11] online and offline classes in STEM education were held for schoolchildren.

Online and offline classes

After six years of online learning – two years of pandemic and four years of the Russian-Ukrainian war – schoolchildren need live interaction, socialization, and communication. Offline classes for schoolchildren in grades 7–11 were prepared and conducted by the Department of Physics and Chemistry in the first semester of 2025.

Offline classes were also held with schoolchildren in grades 7–11 at the departments of the Faculty of Natural, Special and Health Education in the first semester in 2025.

In addition, online classes were conducted with schoolchildren in grades 7–11 by our professors and lecturers at the Department of Physics and Chemistry in 2025.

As part of its cooperation with schools in Kharkiv, the STEM Center at H. S. Skovoroda Kharkiv National Pedagogical University joined the "Weekend University" project, an educational marathon for schoolchildren in Kharkiv and the Kharkiv region organized by local universities. In February 2025, university professors and lecturers provided classes to schoolchildren from various schools in Kharkiv, held not at the university but at the Metroschool (situated in Kharkiv's underground Metro system) and at some of the city's underground schools.[12] For example, at an underground school in the Novobavarsky district of Kharkiv, a class on 'Robots and Digital Learning' was held for 10th and 11th grade students in which university lecturers presented the possibilities of working with modern technologies in robotics.[13]

In March 2025, the Kharkiv Palace of Children's and Youth Creativity hosted a math tournament titled "Pyramid" in a bomb shelter. It aimed at integrating a STEM-oriented approach to education with the requirements of school reforms. The event was attended by seventh-grade students from 23 lyceums in Kharkiv and was an important event in mathematics, especially in the context of a total of four years of online learning in Kharkiv and the region due to the full-scale Russian invasion.[14]

THE UNIVERSITY continues to develop online and partly offline education, digital learning, and STEM initiatives, despite the challenges of war. It highlights real achievements, support for children, teacher training, and the creation of innovative learning spaces. It shows resilience, educational transformation, and community engagement in crisis conditions. The combination of statistical evidence, practical activities, and human-centered support makes education both informative and inspiring, demonstrating how education can remain a powerful force for stability, recovery, and future development.

Volodymyr Borysov is Vice-Rector at H. S. Skovoroda Kharkiv National Pedagogical University, Kharkiv, Ukraine.

references

1 The website is https://sites.google.com/hnpu.edu.ua/khnpu-eduhub; the Telegram channel is https://t.me/eduhubKhnpu; and the YouTube channel is https://www.youtube.com/channel/UCYI0yA8sHKYb81c3-ECJNKQ.

2 The hub is governed by the Regulations on the Educational Hub.

3 The Skovoroda Hub website, created by the Center for Digitalization of Education at H. S. Skovoroda Kharkiv National Pedagogical University using the Google Sites platform, is the main information resource providing comprehensive and up-to-date information about the hub's activities. To enable asynchronous operations, all videos of meetings, seminars, lectures, and training sessions are posted on the Skovoroda Hub YouTube channel in separate thematic blocks. See https://sites.google.com/hnpu.edu.ua/khnpu-eduhub

4 Ibid.

5 This was achieved thanks to the active work of the public relations department, which effectively advertised and promoted the hub on social networks.

6 Information on the Skovoroda Hub is distributed via the WhatsApp, Facebook, and Instagram accounts of H. S. Skovoroda Kharkiv National Pedagogical University, in addition to distributing letters to local communities. This comprehensive approach allows information to be effectively communicated to different target groups and ensures maximum coverage.

7 The center was based at the Skovoroda Hub for blended learning, the Faculty of Physics and Mathematics, and the Faculty of Natural Sciences, Special and Health Education, in accordance with the Regulations on the STEM Center. See: http://hnpu.edu.ua/sites/default/files/files/Normat_dokum/Pol/Pol_STEM_tsentr.pdf.

8 The topics of master's students' research were also expanded to include the implementation of STEM education in secondary schools. During the center's operation, thematic academic disciplines and blocks of elective academic disciplines were developed and implemented for bachelor's and master's students. See http://smc.hnpu.edu.ua/studentu/dytsypliny-za-vyborom/10-studentu/19-bloky-vilnogo-vyboru-bakalavry.

9 A course on STEM Technologies in the Educational Process, designed to correspond to 5 ECTS credits (150 hours, duration of study 1 month), was offered. See https://drive.google.com/file/d/1LNMBO3GwCBKxPrjkzbc1cxP-lfcVbU0m/view.

10 See https://drive.google.com/file/d/1_5wa23uJSDxMeAso8ozJYELn-fu8FibC/view.

11 See https://sites.google.com/hnpu.edu.ua/khnpu-eduhub/%D0%B2%D0%B5%D0%BA%D1%82%D0%BE%D1%80%D0%B8?authuser=0.

12 See also: Ilona Kostikova, Volodymyr Borysov, Tamila Shcheblykina, Maryna Vasylieva, and Olha Pochuieva, "Resilience of school infrastructure: Children's right to education in wartime Ukraine", *Baltic Worlds*, vol. 19, no. 1, 78–87. Available at: https://balticworlds.com/resilience-of-school-infrastructure/.

13 High school students explored the possibilities of programmable electronic circuits, working with the "Znatok" constructor and the Arduino Nano microchip, and used Makey Makey to turn ordinary objects into interactive sensors. See: https://www.facebook.com/share/p/1XjAM4Nd4V/.

14 See https://www.facebook.com/share/p/16F6Dp1YhW/.