OUTCOME REPORT

School Connectivity Week:

Connecting Schools - Empowering the education of tomorrow!

September 11th-13th, 2023

ACKNOWLEDGEMENTS

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INTRODUCTION

School Connectivity Week "Connecting Schools - Empowering the Education of Tomorrow!" was held in the hybrid format from 11th to 13th September 2023. The event was organized by the International Telecommunication Union (ITU) with the support of the M. Dulatov Kostanay Engineering and Economic University (KEnEU), Kazakhstan.

The purpose of the School Connectivity Week was to familiarize representatives of the telecommunications industry and specialists in the field of education in Central Asia LDCs (Giga beneficiaries Kazakhstan, Kyrgyzstan, Uzbekistan and other LDCs) with the various national surveys on school connectivity as well as software products created within the framework of ITU global and regional initiatives in order to map broadband infrastructure and identify the most promising options for school connectivity and LAN infrastructure enhancement, increase human potential, as well as the choice of appropriate technology with the lowest CAPEX, an overview of business planning of school connectivity projects to ensure their viability by key representatives of the industry, as well as the development of targeted recommendations for the further formation of partnerships in this field.

Key topics covered by the event included:

Session 1:   Presentation of ITU surveys on actual use and quality of connectivity in schools and school local network infrastructure resiliency;

Session 2:   Presentation of ITU Knowledge bases on technical and economic aspects of school connectivity and ITU Sample construction documentation on building and enhancing school local infrastructure to be safe, secure, resilient, contingent, and fit for purpose;

Session 3:   Training for representatives of the telecommunications and education industries on the technological and economic aspects of school connectivity, school LAN infrastructure, ICT business planning and infrastructure mapping.

The event also included the official opening of the ITU Smart Education Ecosystem in Kostanay and Kostanay Oblast, a presentation of the smart education network, including an overview of the ITU Smart Education Hub at KEnEU and a tour to one of the connected schools.

The main outcomes of the regional forum are outlined in this report, which structures the key points emerged during each session.

1. PARTICIPATION

The event is addressed to representatives of the telecommunications and education industries of Central Asia LDCs (Giga beneficiaries: Kazakhstan, Kyrgyzstan, Uzbekistan and other LDCs), including representatives of government entities and central executive authorities, telecommunications operators, ISPs, professional designers, research institutes, academia, school administrators and technicians, software developers and other interested parties. Eminent ITU and UNICEF speakers presented and discussed during the sessions. Details about the programme and speakers as well as all the presentations delivered, can be found on the event's website.

Over **80** registered participants from **34** organisations and **9** countries (Armenia, Belarus, Belgium, Kazakhstan, Kyrgyzstan, Russia, Uzbekistan, Switzerland, and Ukraine) took part in School Connectivity Week. On average about 30 people in each session participated online. Participants included high-level representatives of administrations and national regulators from the CIS countries and the Central Asian region.

Figure 1 – Group photo of participants

2. DOCUMENTATION

School Connectivity Week "Connecting schools: empowering education for tomorrow!" was held in the hybrid format. Relevant documentation, including: the programme, presentations, **video recordings** as well as this outcome report are available on the event's website: https://www.itu.int/ru/ITU-D/Regional-Presence/CIS/Pages/EVENTS/2023/Connectivity%20Week.aspx.

Additional materials include:

1. Presentations;
2. Photos;
3. Webcast archive (Youtube)
   - 3.1. Review;
   - 3.2. Day 1;
   - 3.3. Day 2;
   - 3.4. Day 3 (Trainings);
4. Articles, interviews, reportages, and media stories
   - 4.1. Television
     - 4.1.1. "Alau" TV and radio company (LLP "Alau-TV"), TV news - 12.09.23 (12 min);
     - 4.1.2. "Qostanai" TV channel, «ARQA-AQPARAT» issue - 12.09.23 RU (12 min) and KZ;
   - 4.2. Printed publications
     - 4.2.1. "Kostanay Tany" oblast socio-political newspaper, issue 13.09.23, Мектептерді интернетке қосу әлі де маңызды (pdf);
     - 4.2.2. "Kostanay news" regional socio-political newspaper, issue 14.09.23, Positive experience is available (pdf)
   - 4.3. Online publications
     - 4.3.1. "Kostanay-AGRO" weekly regional agrarian socio-political newspaper, 14.09.2023, Connecting schools, expanding the opportunities of tomorrow's education;
     - 4.3.2. "Teachers Plus" oblast public information and educational newspaper, issue No. 35(583), 15.09.2023, Fast internet - quality education.

3. OPENING ADDRESSES AND SETTING THE CONTEXT

In his opening speech, **Mr Rinat Mukhametkaliev**, Deputy Akim of Kostanay region, welcomed the participants, expressing his joy that such a significant event was held in Kostanay. Mr. Mukhametkaliev drew attention to the importance of using information technologies in the educational process, which was especially necessary at times of COVID-19 pandemic and is currently becoming even more relevant. Mr Mukhametkaliev noted that currently all 447 schools of Kostanay Oblast are provided with Internet access, including 230 schools with access speed of 20 Mbit/s and higher. Deputy Akim also shared plans to provide high-speed Internet access to 14 more schools in the region in the next calendar year, which will allow rural schools to fully utilize the opportunities of the educational process. Mr Mukhametkaliev shared information about provision of schools with modern computer equipment and software, and focused participants' attention on the existing problem that the high-speed connection of 150 remote rural schools to the Internet remains technically and economically difficult to implement. Mr Mukhametkaliev expressed his hope to

develop effective recommendations within the framework of the forum and wished the participants the fruitful work.

Then Ms. **Natalia Mochu**, Director of ITU Regional Office for CIS, addressed the host and the audience, saying that the event is aimed at providing the information on ITU tools and technical capacities that can help solve existing problems in the regions to connect schools to the Internet. Ms. Mochu mentioned the implementation of the joint project "Creating Smart Educational Ecosystem in Kostanay and Kostanay Oblast" also contributing to the goal of bridging the digital divide, expressed her sincere gratitude for holding the event specifically in the region and wished all participants an active and open discussion

Ms. Mochu's opening address was continued by **Mr. Farid Nakhli**, ITU Programme Coordinator, who presented information on the global and regional programmes of the International Telecommunication Union in CIS countries. **Mr Baghdad Kulnazarov**, UNICEF expert, provided detailed information on the Giga initiative, regarding mapping the schools, assessing their connectivity status and monitoring the quality of Internet connection in real time. **Mr. Ihar Shchetko**, ITU Connectivity Project Officer, then presented ITU tools for broadband infrastructure mapping, infrastructure analysis and business planning for ICT projects.

4. SIDE EVENT: PRESENTATION OF SMART EDUCATION ECOSYSTEM IN KOSTANAY AND KOSTANAY OBLAST

Objective: To familiarize representatives of the telecommunications and education industries of Central Asia LDCs (Giga beneficiaries Kazakhstan, Kyrgyzstan, Uzbekistan and other LDCs) with the ITU experience on creation of an educational network in the city of Kostanay with the support of the Ministry of Digital Development, Innovation and Aerospace Industry of the Republic of Kazakhstan and the Akimat of Kostanay Oblast.

Moderator: Farid Nakhli, ITU Programme Coordinator

Speakers: Presentation 1 "Organisational aspects of ITU Smart Educational Ecosystem in Kostanay", Zhanat Jabasova, Senior Lecturer of the Department of Economics and Management, Head of the Centre for International Cooperation and Project Implementation, KEnEU; Presentation 2 "Structure of ITU Smart Education Hub at KEnEU and technical aspects of ITU Smart Education Ecosystem in Kostanay", Alisher Amantaev, Head of the Department of Digitalisation and Information Technologies, KEnEU.

The ITU Smart Education Ecosystem in Kostanay and Kostanay Oblast was established under WTDC-17 CIS RI 2: Use of telecommunications/information and communication technology to ensure inclusive, equitable, quality and safe education, including the enhancement of women's knowledge of ICTs and e-government. The regional partner was M. Dulatov Kostanay Engineering and Economic University (KEnEU), supported by the Ministry of Digital Development, Innovation and Aerospace Industry of the Republic of Kazakhstan and the Akimat of Kostanay Oblast.

Over 900 users from 8 educational institutions, including 6 schools, are connected to the ITU Smart Educational Network in Kostanay and Kostanay Oblast.

Connecting the school to the Smart Educational Network has provided the school with the following opportunities:

1. Covering the school territory with a wireless segment of a local computer network (through which students, teachers and administration receive broadband access to the channels of the Internet provider serving the school).
2. Access to digital libraries and learning materials from the university and other sites in the network. This allows students and teachers to access up-to-date information.
3. Digital skills development - the implementation of the learning ecosystem helps to develop students' digital skills. They gain experience with modern information technologies, learn how to use Internet access effectively for learning purposes, and develop skills in searching, analyzing, and evaluating information.
4. A platform for publishing school announcements or news. This is especially relevant in situations where information needs to be communicated as quickly as possible.
5. Counselling and technical support for the school's teaching and technical staff allows for problem solving, staff training and effective use of available resources.
6. Efficient management of network resources, stable network operation, even speed distribution on all devices.
7. Securing and controlling the use of traffic for educational purposes.
8. Improving the quality of education, in general – when available to the school all the functions mentioned above contribute to improving the quality of education.

After the presentation of organizational and technical aspects of the ITU Smart Education Ecosystem in Kostanay, **the opening ceremony of the ITU Smart Education Hub at KEnEU and a tour took place**.
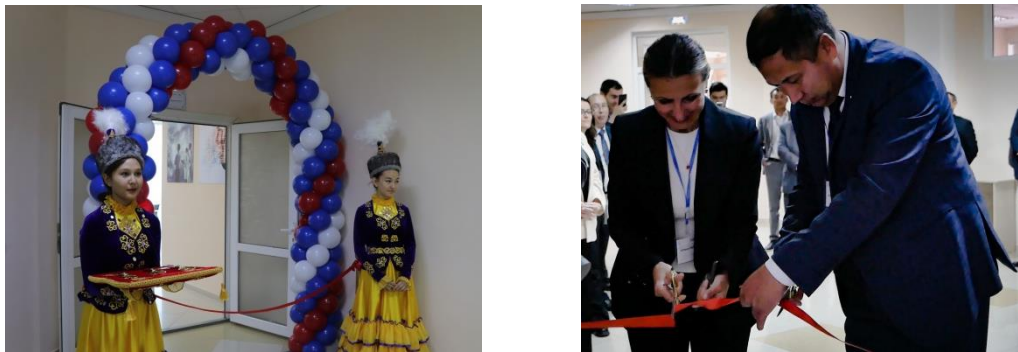
Figure 2 – Official opening ceremony

Then there was a **field visit with a tour** to "N. Ostrovsky Amankaragai general education school of the Department of Education of the Akimat of Auliyekol district" of Department of Education in Kostanay Oblast, **a beneficiary school connected to the ITU Smart Educational Network in Kostanay**.

The school is about 150 kilometers from Kostanay. The school has 728 students (33 classes) and 77 teachers.

"N. Ostrovsky Amankaragai general education school of the Department of Education of the Akimat of Auliyekol district" and KSU "Amankaragai general education school No. 2 of the Department of Education of the Akimat of Auliyekol district" of Department of Education in Kostanay Oblast were connected to the ITU Smart Educational Network in Kostanay in September 2022. Auliekol district in early September 2022 was covered by a large-scale forest fire, the territory of which was 43 thousand hectares, so the connection of two district schools became one of the acts of assistance to those affected by the disaster.

Figure 3 – Field visit to the beneficiary school

As a result, the Presentation of Smart Education Ecosystem in Kostanay and Kostanay Oblast:

- has raised awareness of stakeholders and decision-makers in the telecommunications and education industries on the use of ITU experience on providing educational institutions with telecommunications and information services, such as a high-speed Internet, a platform for organizing distance learning, connecting to an electronic library of universities and educational resources, network management and monitoring.

- has helped to identify the potential partners for projects in the field of creating new smart education ecosystems and scaling the existing one to bridge the digital divide and deepen digital inclusion in the other vital fields (industry, healthcare etc.), as well as extending smart education ecosystem to the other regions of the Republic of Kazakhstan.

5. SESSIONS OF SCHOOL CONNECTIVITY WEEK

SESSION 1: PRESENTATION OF ITU SURVEYS ON ACTUAL USE AND QUALITY OF CONNECTIVITY IN SCHOOLS, AND SCHOOL LAN INFRASTRUCTURE RESILIENCY

Focus: Results of the ITU national surveys on actual use and quality of connectivity in schools in Kazakhstan, Kyrgyzstan, and Uzbekistan, as well as the resilience of school LAN infrastructure.

Moderator: Batyrkhan Tanashev, Project Manager of the Centre for International Cooperation and Project Implementation, KEnEU, Kazakhstan.

Speakers

Actual Use and Quality of Connectivity in Schools in Kyrgyzstan, Kazakhstan, and Uzbekistan: Presentation 1, Igor Zimin, ITU Expert, Kyrgyzstan; Presentation 2, Zhanat Jabasova, Senior Lecturer, Department of Economics and Management, Head of the Centre for International Cooperation and Project Implementation, KEnEU, Kazakhstan; Presentation 3, Behzod Abdullaev, Head of Digital Technologies Department, IT Park, Uzbekistan.

Resilience of Local Area Network Infrastructure in Schools in Kazakhstan, Kyrgyzstan, and Uzbekistan: Presentation 4, Igor Zimin, ITU Expert, Kyrgyzstan; Presentation 5, Alisher Amantaev, Head of Digitalization and Information Technology Department, KEnEU, Kazakhstan; Presentation 6, Behzod Abdullaev, Head of Digital Technology Department, IT Park, Uzbekistan.

Recommendations

- Increasing the speed of the internet connection. The faster the internet connection speed, the faster students can access the resources and information they need to learn. Therefore, it is necessary to install faster and more reliable connections in schools.

- Upgrade school network equipment. Upgrading school network equipment, such as routers and switches, can help improve the quality of the Internet connection. New equipment can support faster data transfer speeds and reduce latency.

- Optimization of network infrastructure. Schools can use various technologies to optimize the network infrastructure, such as load balancers, which distribute traffic between different connections to maximize speed.

- Use of cloud technologies. Schools can use cloud-based technologies such as Google Classroom or Microsoft Teams to improve the availability and access speed to resources and learning materials.

- Training students and teachers on Digital literacy. Training students and teachers in the use of online resources and technologies can help improve the use of the Internet in schools. Schools can organize training sessions and workshops to help participants learn about modern technologies and put them into practice.

- Checking the quality of the connection. Schools can regularly check the quality of their Internet connection using services such as Speedtest or Ping-test to ensure that the connection is running at maximum speed and without disruption.

- Backup channel redundancy. Schools can use multiple Internet connection channels to provide a backup connection in case the main one fails.

- Data backup. It is important to regularly back up all data on the school LAN servers so that in case of hardware failure or other issues, the network can be quickly restored, and valuable information is not lost.

- Protection against viruses and hackers. Anti-virus software and hacker protection should be installed on school LANs. It is also important to update the software regularly to address security vulnerabilities.

- Planning the location of the equipment. When designing and installing equipment, possible risks such as fire or flooding must be considered. Equipment should be placed in safe locations and servers should have backup power and cooling systems.

- Staff Training. School staff should have sufficient knowledge and skills to maintain and manage the local network. Regular training and courses on computers, network devices and software should be organized.

- Installation of monitoring systems. Schools should install monitoring systems to monitor network performance and detect problems. This will allow problems that may affect the network to be quickly detected and resolved.

- Use of cloud storage. Cloud services can be used to reduce the risks associated with storing data on the school local network servers. Such services allow you to store data in cloud storage, which reduces the risks of data loss and hardware failure.

- Regular hardware upgrades. Schools should update their hardware and software regularly to ensure better security, greater productivity, and resilience.

- Conduct an audit of the existing network infrastructure to identify gaps and opportunities for improvement. Based on the results of the audit, a plan can be developed to expand the network infrastructure, including installing additional network equipment, increasing connection speeds, and improving Wi-Fi coverage.

- Setting up protection mechanisms, monitoring and updating software, and educating students and educators on safe Internet use.

SESSION 2: PRESENTATION OF THE ITU KNOWLEDGE BASE ON THE TECHNICAL AND ECONOMIC ASPECTS OF BROADBAND ACCESS IN SCHOOLS AND THE ITU MODEL PROJECT DOCUMENT FOR BUILDING AND OPTIMISING LOCAL AREA NETWORK INFRASTRUCTURE IN SCHOOLS TO ENSURE IT IS SAFE, SECURE, RESILIENT AND FIT FOR PURPOSE

Focus: Technical and economic aspects of broadband access and Sample construction documentation on building and enhancing local network infrastructure in schools in Kyrgyzstan, Kazakhstan, and Uzbekistan to ensure its safety, security, resilience and fit for purpose

Moderator: Batyrkhan Tanashev, Project Manager of the Centre for International Cooperation and Project Implementation, KEnEU, Kazakhstan.

Speakers: Presentation 1, Igor Zimin, ITU expert, Kyrgyzstan; Presentation 2, Alisher Amantaev, Head of Digitalisation and Information Technology Department, KEnEU, Kazakhstan; Presentation 3, Behzod Abdullaev, Head of Digital Technology Department, IT Park, Uzbekistan.

Recommendations:

- The survey results show there is an urgent need for national strategies and plans for school digitalization. For example, now in many countries there is no uniform roadmap for digitalization of schools, there is no relevant digital infrastructure, therefore, it is necessary to develop regulations governing the processes of digitalization implementation.

- The digitalization of school education will entail the need to modernize the content of educational programmes to take into account the digital technologies being introduced. It is necessary to study international experience in the implementation of digital learning comprehensively and to bring all existing training programmes and standard operating procedures into compliance.

- It is necessary to study the question of local digital educational platforms development or adapt foreign analogues.

- Lack of design and construction documentation for local area networks, wireless Internet access segments, blueprints/schemes of structured cabling system, blueprints/schemes of cable entry into the building, cable logs, etc. in schools.

- The need to develop ITU Sample construction documentation on building and enhancing the local network infrastructure in schools to ensure its safety, security, resilience and fit for purpose.

SESSION 3: TRAINING ON "TECHNOLOGICAL AND ECONOMIC ASPECTS OF SCHOOL CONNECTIVITY, SCHOOL LAN INFRASTRUCTURE, ICT BUSINESS PLANNING AND INFRASTRUCTURE MAPPING"

Objective: Increasing the human potential of the trainees and capacity building in such areas as identifying the most promising options for school connectivity and LAN infrastructure enhancement, selecting the appropriate technology with the lowest CAPEX, broadband infrastructure analysis and mapping, business planning of school connectivity projects to ensure their viability.

Instructor: Igor Shchetko, Connectivity Project Officer, ITU

Participants: 20 offline and 12 online participants

Training content and programmes:

- **School connectivity planning tools, school connectivity analysis on the the example of the Giga project**
  The participants were introduced to the methodology and tools for analyzing the current state, assessing the opportunities and resources needed to connect schools to the Internet using examples from the Giga project.

- **Data preparation for telecommunications infrastructure development projects.**
  Participants learnt how to collect and prepare data to assess the need for and current state of telecoms infrastructure; templates for data preparation, standards, open data sources, software.

- **Business planning of the projects in the field of information and communications technology projects**
  Participants learnt how to use the data and existing tools to assess the possibility of connecting schools and other social facilities, households, communities, and the attractiveness of ICT projects according to selected economic criteria.

- **Interactive infrastructure maps**
  Participants explored ways to visualize geospatial data using existing tools and open-source geographic information systems.

Based on practical exercises and testing results, the participants were awarded certificates of successful training completion.

Figure 4 – Presentation of certificates to training participants

CLOSING CEREMONY

Mr. Arman Ismailov, Rector of KEnEU, Kazakhstan, noted that the event provided a good platform to discuss school connectivity and the development of modern digital education in the spirit of cooperation both between countries for the purpose of knowledge transfer and all parties involved in the process of digitalisation of schools.

Mr. Ismailov congratulated the participants on the successful completion of the training and solemnly handed over the certificates. Mr. Ismailov also thanked everyone for their active participation in the event and announced the end of School Connectivity Week'2023.

Participants at the event noted:

1) the relevance of School Connectivity Week, as well as the expediency of holding similar events in the future with the involvement of administrative and teaching staff of schools, as well as school computer network administrators;

2) practical significance of the presented reports for international organisations, ministries and departments, higher education institutions, research organisations, telecommunication operators, administrative and pedagogical staff of schools, as well as administrators of school computer networks - the materials of the event can be used by the participants in their professional activities;

3) the key role of international and inter-institutional cooperation as well as government support, including the existence of public policies, in the development of digitalisation of education;

4) the need for more active involvement of representatives of telecom operators, academia, R&Ds in this work;

5) the need for regular monitoring and evaluation of actual usage and quality of Internet connection in schools in Kazakhstan, Kyrgyzstan, and Uzbekistan;

6) the need for regular monitoring and assessment of safety, security, resilience and fit for purpose of local network infrastructure in schools of Kazakhstan, Kyrgyzstan, and Uzbekistan;

7) the importance of timely development of the regulatory, legal, and administrative framework in this area.

The participants expressed their sincere gratitude to the moderators and speakers of the event, to the management and staff of the International Telecommunication Union and M. Dulatov Kostanay Engineering and Economic University for excellent organisation and conduct of the School Connectivity Week.