SCHOOLS 2030

HOLISTIC
LEARNING
INNOVATIONS

CHEMISTRY AND BIOLOGY CLUBS

Country: Tajikistan

Target Age: 15 Years

Learning Areas: Literacy | Problem Solving | Collaboration | Science | Digital Literacy | Creativity | Communication

THE CONTEXT

Secondary School No. 2 is located in Danghara, a lively town which is also the home of the country's President. The school serves students with diverse academic interests and future aspirations, including careers in healthcare. Science subjects such as chemistry and biology are part of the national curriculum, but limited access to laboratory equipment means that science learning has traditionally relied on textbooks and rote memorisation rather than hands-on inquiry.

School #2, Danghara district, Khatlon region, Tajikistan

Nazokat while interviewing her students

Nazokat's students being involved and engaged in chemistry lesson

THE CHALLENGE

How might we connect science theory to everyday life?

Students found chemistry and biology difficult to understand because lessons were largely theoretical and disconnected from real-life application. The lack of laboratory materials made it challenging to demonstrate experiments or allow students to practise scientific investigation, resulting in low motivation and limited participation. Many learners struggled to retain information and felt overwhelmed by memorisation demands, despite expressing ambitions to pursue science-related careers. This disconnect between students' aspirations and their classroom experience highlighted the need for a practical, accessible approach to science learning that could work without formal laboratory infrastructure.

THE INNOVATION

CHEMISTRY AND BIOLOGY CLUBS

To address these challenges, teacher Nazokat established a Chemistry and Biology Club for Grade 9 students. The club provided a dedicated space for inquiry-based learning, allowing students to conduct experiments and research using locally available, low-cost materials, including herbs and everyday substances.

Students worked individually and in groups to investigate scientific properties, document observations, and prepare presentations for peers. The innovation also incorporated community-based learning, with students interviewing local herbal specialists and pharmacists to understand how scientific knowledge is applied in real contexts. Through regular club sessions, learners practised experimentation, discussion, presentation, and collaborative problem-solving, shifting science learning from memorisation to exploration.

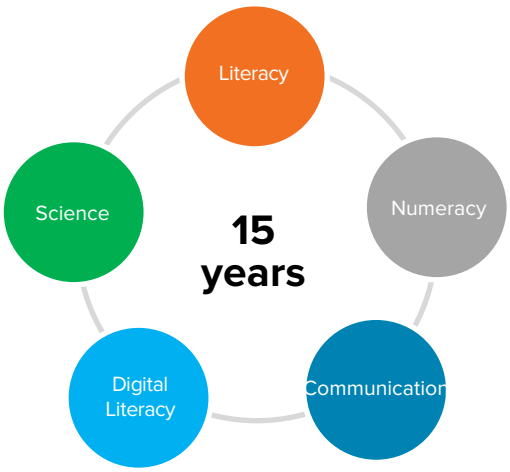
Nazokat and her students in the chemistry club and interviewing a herb specialist

Competencies Targeted

The graphics below show the selected domains that Schools2030 Tajikistan have prioritised for each age group, in line with national curricula. Highlighted are the domains that this specific solution addresses.

5-year-old Domains

10-year-old Domains



15-year-old Domains

The solution also targets:

- *Collaboration*
- *Creativity*
- *Problem-solving skills*

Nazokat and another teacher from the school experimenting in the chemistry lab

The teacher and students doing research and applying their theoretical knowledge practically

THE IMPACT

Strengthened science understanding through hands-on investigation

The science club led to increased student engagement, curiosity, and confidence in chemistry and biology. All Grade 9 students began attending sessions regularly and participating actively in experiments and discussions. Learners demonstrated improved understanding of scientific concepts by linking theory to practical investigation, and teachers observed stronger collaboration, communication, and independent thinking. Students became more motivated to share their findings through presentations and discussions with classmates and the wider school community. Overall, the innovation helped reposition science as relevant, achievable, and connected to students' daily lives and future goals.

Meet the Teacher

Nazokat Mahmadieva

Biology and chemistry teacher at school #2, Danghara district, Khatlon region, Tajikistan

- I have been in my current role for 4 years
- Owing to my dedication towards my profession and efforts my innovative design solution was selected to be presented at the National “Innovative Teacher” Forum in Tajikistan.
- My solution was identified as the best pedagogical design to represent Tajikistan at the Schools2030 Global Forum in Porto of Portugal.
- "I was thrilled to present my design innovation at the Schools2030 Global Forum which gave me the opportunity to share my experience with diverse teachers from all over the globe, as well as to learn from them and implement insightful practices relevant in our context with my colleagues in my school”.

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