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RESEARCH TRAINING FOR THE KNOWLEDGE SOCIETY: EXPERIENCE IN THE “STEP INTO THE FUTURE” PROGRAM

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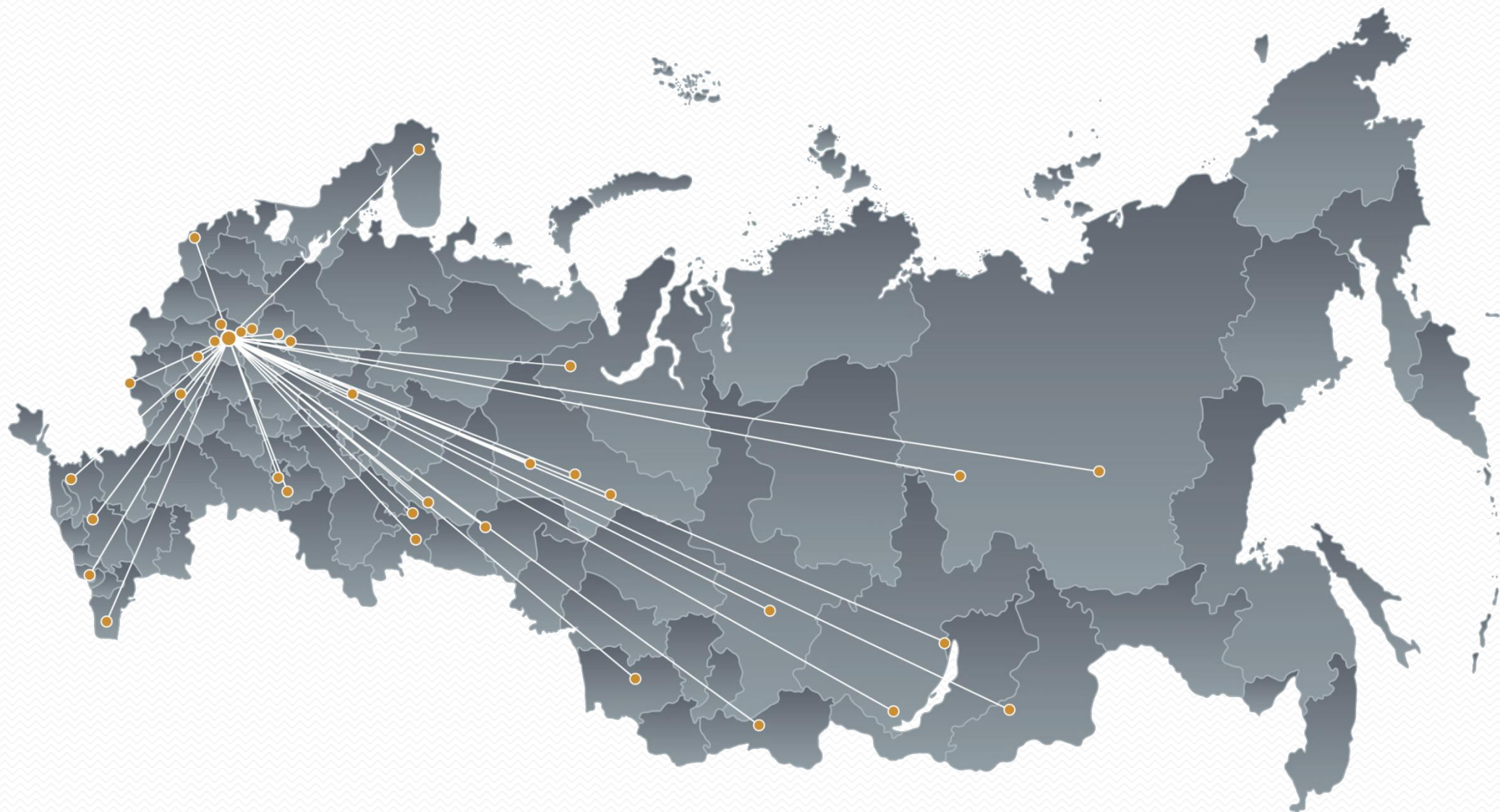
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“STEP INTO THE FUTURE” PROGRAM





REGIONAL NETWORK OF THE “STEP INTO THE FUTURE” PROGRAM





PARAMETERS OF THE “STEP INTO THE FUTURE” PROGRAM

Area of activities – 9 time zones

Participants – 150,000

Age – from 7 to 18 years

Regional offices – 49

Scientific tutors – 5200

Schools – 4500

Universities – 114

Scientific institutes – 52





SCIENTIFIC-TYPE RESEARCH BEHAVIOR

Cognitive dimension – scientific methodicalness of thinking, critical rationalism, logic (including logic of contradictions)

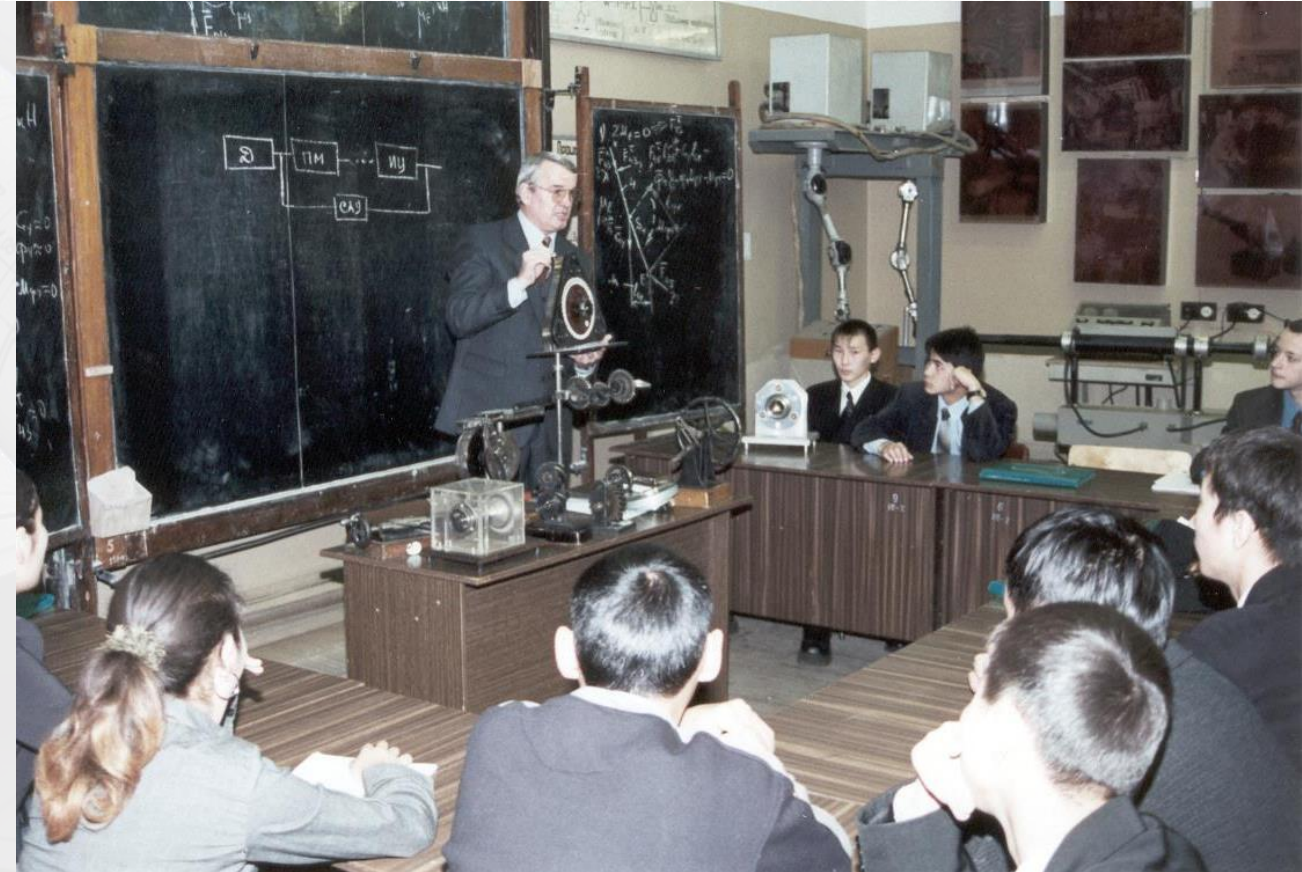
Emotive-suggestive dimension – persistence in cognition, resistance to uncertainties, scientific interest

Values dimension – allegiance to the truth, cognitive reliability (empirical and logical verifiability of knowledge), traditions of the scientific community





Generative learning
Generative learning environment
Generative evaluation





School ↔ University

Learning method – scientific research

Cognition way – scientific-type creative thinking

Learning environment – network institutional partnership

Pedagogical subject – pedagogical couple (teacher/professor-mentor)



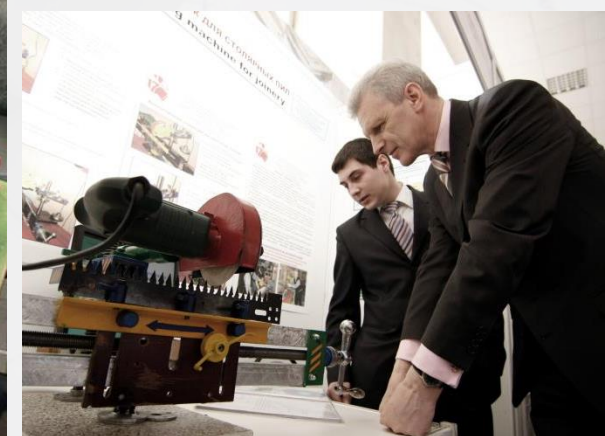
METHOD OF SCIENTIFIC RESEARCH:

Stages of research training

First stage – engagement of learners via initial cognitive practices

Second stage – development of a scientific-cognitive trajectory for a person

Third stage – introduction of outcomes of research activities of learners into life of society





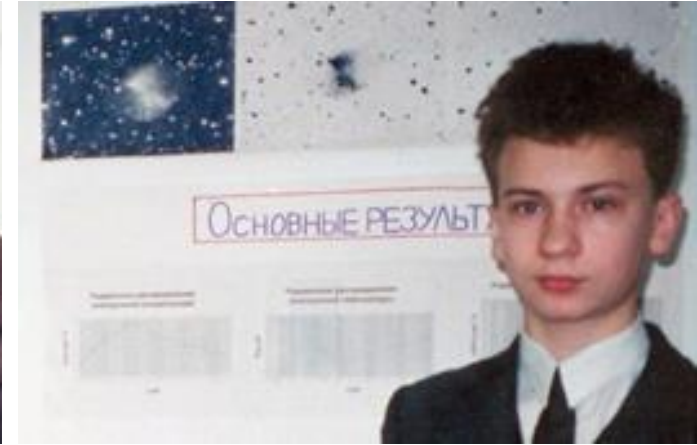
WHAT SCHOOLCHILDREN-RESEARCHERS ARE ABLE TO DO?



Valeria Grigorieva, 2000, Astrakhan
At the age of 17, she developed a cost-efficient method to use wastes of a fish meal plant for production of “tanker shampoo” – the unique solution for cleaning tanks to remove grease and oil residuals. The results were patented; business company was registered and opened



Anton Gureev, 2001, Samara
At the age of 16, he developed a compact diagnostic complex with a fiber-optic system for transportation of a laser beam, which made it possible to reveal hidden subcutaneous tumors in humans at an early stage of development. An operating model was developed.



Alexander Obushchenko, 2004, Krasnoyarsk
At the age of 16, he completed his first scientific work “The Effect of Giant Acceleration of Fractal Nanostructures in Aerosols under Action of Light”. The article with his participation was published in “Physical Review” - one of the most prestigious international journals.



METHOD OF SCIENTIFIC RESEARCH: Description

Main objectives:

pedagogical objective – upbringing of a researcher

the epistemic objective – cultivation of research competences

ontological objective – formation of scientific-type research behavior

Essence of the method:

social and existential learning of becoming of a person involved in scientific-cognitive attitudes to the world





PROBLEM-COGNITIVE PROGRAM: Example



Anastasia Efimenko, 2000, Petrozavodsk

Winner of the Competition of European Union Contest for Young Scientists (EUCYS), Representative of young European scientists at the Nobel Prize Award Ceremony

"My challenge to children's mortality" project

"About half of fatal cases of early infant mortality and disability are due to hereditary factors! How can we facilitate the fate of these children? A genetic study carried by me in Karelia makes it possible to predict a spread of the severe hereditary disease – phenylketonuria, and show its connection with migrations of the population"



PROBLEM-COGNITIVE PROGRAM: Definition

The problem-cognitive program for an individual is a long-lasting diversity of research-type cognitive activity, which, at a certain time point, acquires distinctive thematic directions, focuses on promising problematics and occupies an important status in socio-cognitive self-making of a person





MODELS OF LEARNING ENVIRONMENT

Learning and scientific innovation environment:
it describes the object surrounding of research
training at the structural-functional level and the
meta level (the epistemic mega-constructor)

Creative space:
cognitive-generative system that stimulates
creativity on the basis of an emergent combination
of generative-type cognitive practices with
epistemically active environment





SCHOOL OF COGNITIVE ROLES AND SOCIO-CULTURAL EXPERIENCE

Cognitive role:
a way of mental functioning in the social
structure of society; in learning is located above
the subject area

Types of cognitive roles:
creative, instrumental, service, organizational

Cognitive roles of creative type:
knowledge-making, designing, technologizing,
modifying, entrepreneurial, compiling





COGNITIVE-CULTURAL POLYMORPHISM

In the knowledge society

Complementary freedom of coexistence of thinking of different cultural groups as well as culturally comfortable conditions of cognitive actions

In an educational institution

Inclusion in educational process the following items:

- 1) cultural material of social groups, including ethnic materials
- 2) training methods providing culturally comfortable cognitive actions
- 3) creative activity in the sense of a culturally determinated phenomenon



THANK YOU FOR YOUR KIND ATTENTION!



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