北京师范大学智慧学习研究院
Smart Learning Institute of Beijing Normal University

SESSION 2: POLICY SUPPORT AND GOVERNANCE FRAMEWORKS

The 4 Policy Suggestions for Sustainable STEM Education

Prof. HUANG Ronghuai

Co-dean of Smart Learning Institute of Beijing Normal University
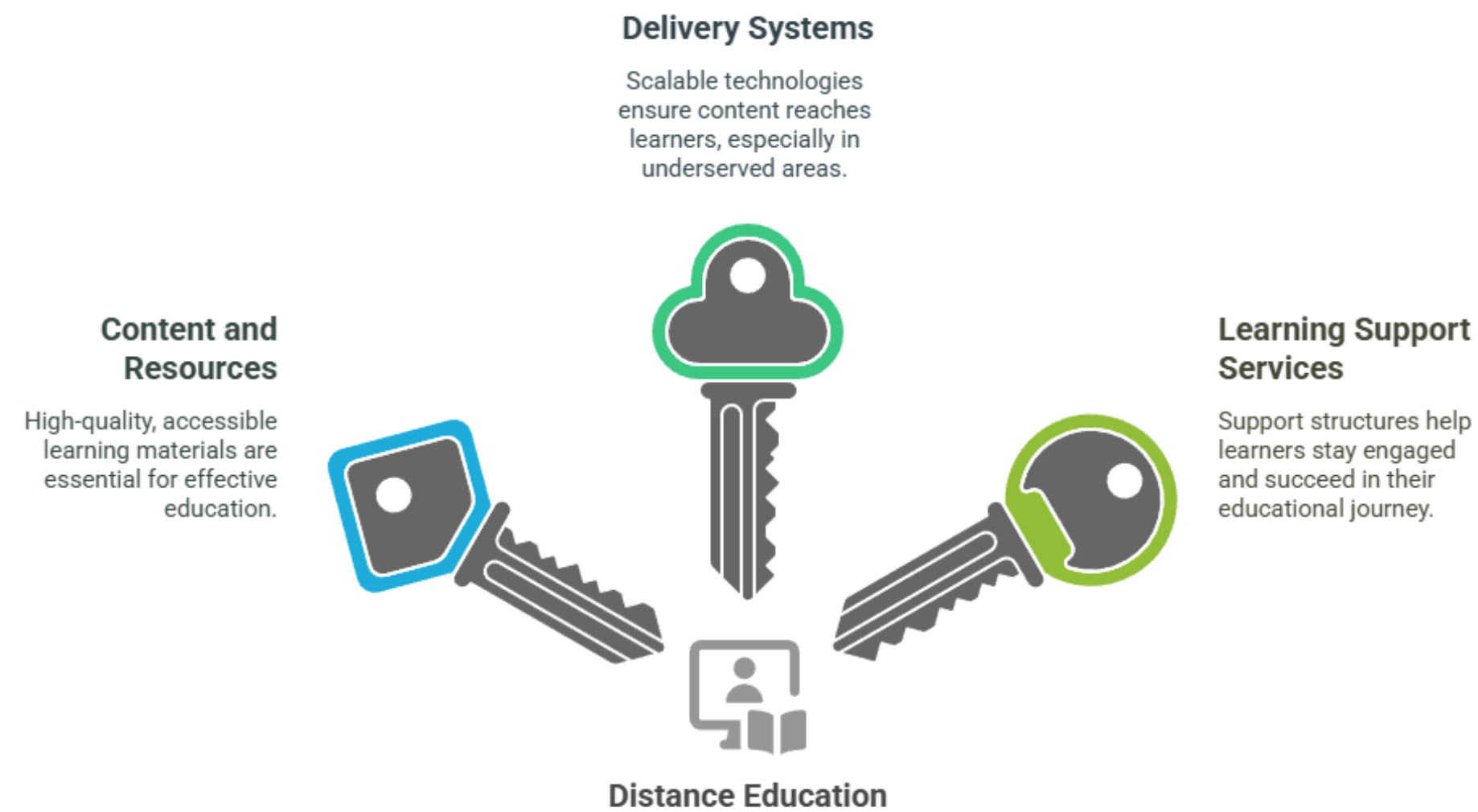
UNESCO Chair on AI in Education

Open universities must adopt sustainable models to ensure long-term viability. This includes **financial, operational, technological, pedagogical & social** sustainability

Operational Sustainability

Efficient management and quality assurance

Technological Sustainability

Integration of advanced tech for scalability

Financial Sustainability

Strategies for stable funding and cost reduction

Social and Pedagogical Sustainability

Inclusive and engaging educational practices

Sustainability Framework for Open Universities

Awang, A. I. (2025, March 5–6). *Open universities in the AI era: Opportunities and challenges* [Seminar presentation]. Global Dialogue Forum on Open Universities in the AI Era, Beijing Normal University, China.

Key Components of Distance Learning

Delivery Systems
Scalable technologies ensure content reaches learners, especially in underserved areas.

Content and Resources
High-quality, accessible learning materials are essential for effective education.

Learning Support Services
Support structures help learners stay engaged and succeed in their educational journey.

Distance Education

To deliver inclusive, high-quality, and cost-effective distance education, three integrated keys are essential—Contents, Delivery Systems, and Learning Support Services.

Distance Learning in Africa during COVID-19

TV-based DL
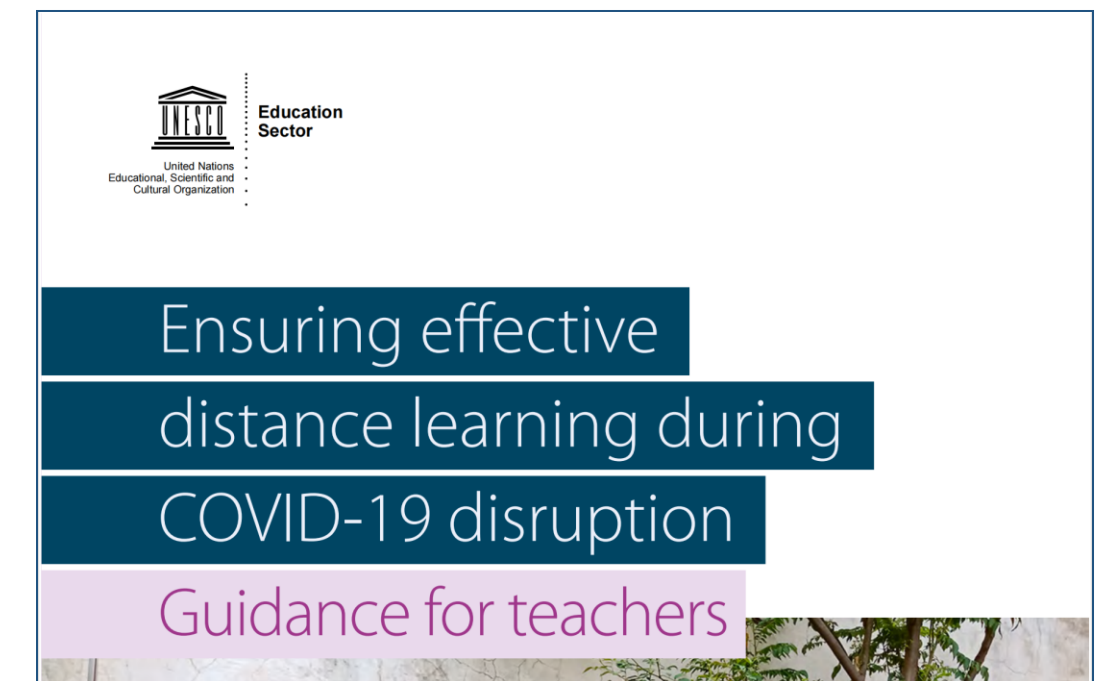*Digital or Analogue TV*

Radio-based DL
Interactive or One-way Radio

Print-based DL
Textbooks and print-material packages

Online DL
- *Platform-based online learning*
- *Teacher directed live streaming lessons*
- *Video-based flipped learning*

Ensuring effective distance learning during COVID-19 disruption
Guidance for teachers

— Fengchun Miao, Ronghuai Huang, Dejian Liu, and Rongxia Zhuang, *Ensuring effective distance learning during COVID-19 disruption: Guidance for teachers*

e-Textbooks for Emerging B-d Programmes

- Artificial Intelligence
- Territorial and Spatial Planning
- Intelligent Manufacturing
- Smart agriculture
- …

Virtual and Simulation Experiment (VSE) Program

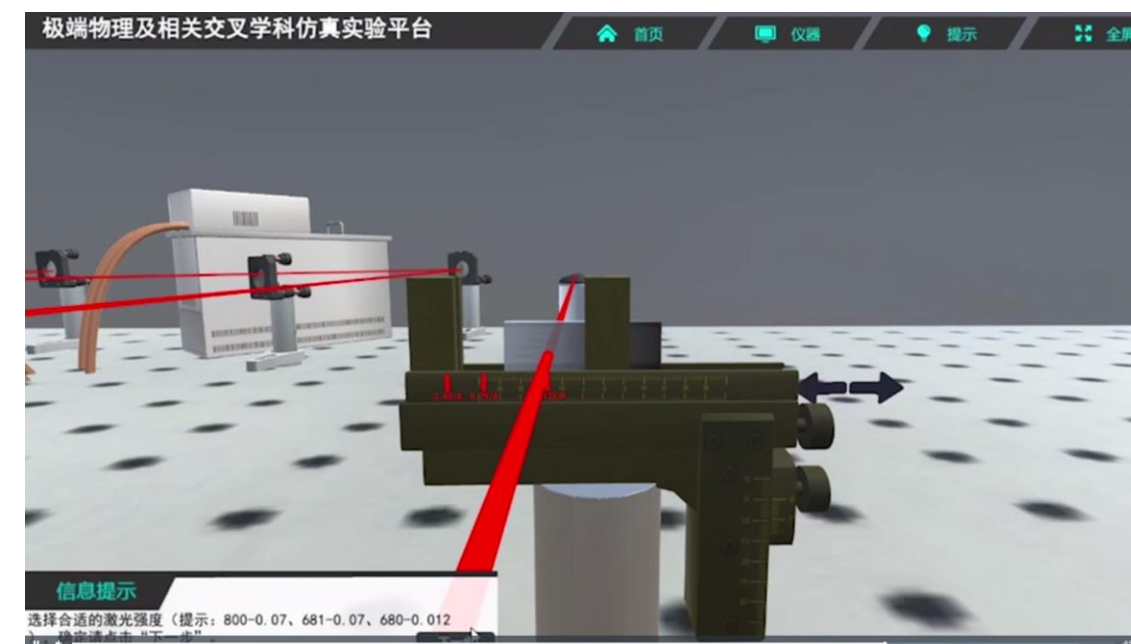National Virtual Simulation Experiment Teaching Centers: **300**

- Science and technology: 211
- Agriculture, Forestry and Medicine: 53
- Humanities and Social Sciences: 36

Online Virtual and Simulation Experiments in iLAB-X: **2079**

(Higher Education Electronic Audio & Visual Publishing Co. Ltd)

Virtual Simulation Experiment of Aircraft
Environment Control System
(*Beihang University*)

Virtual Simulation Platform for Physics under
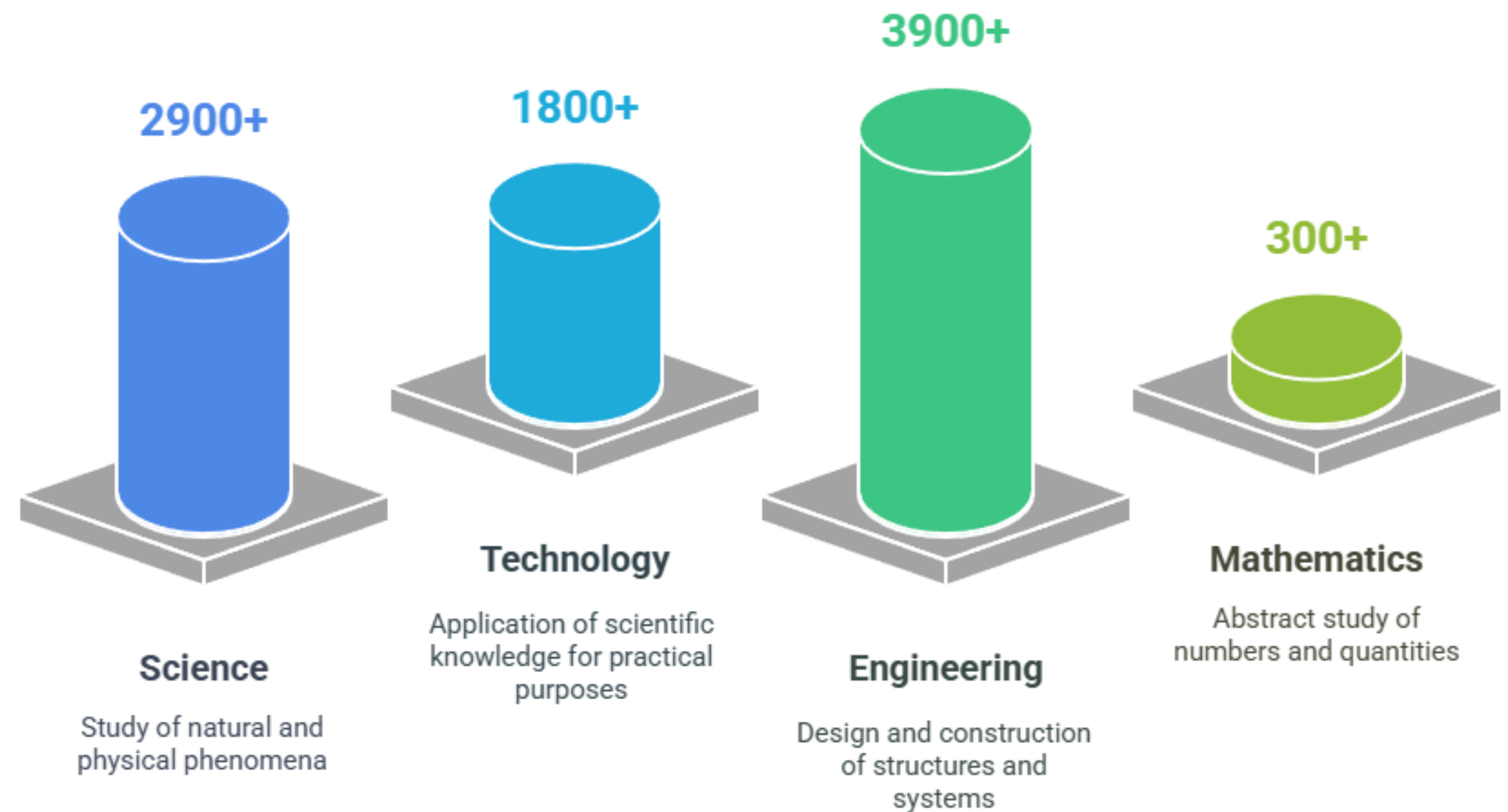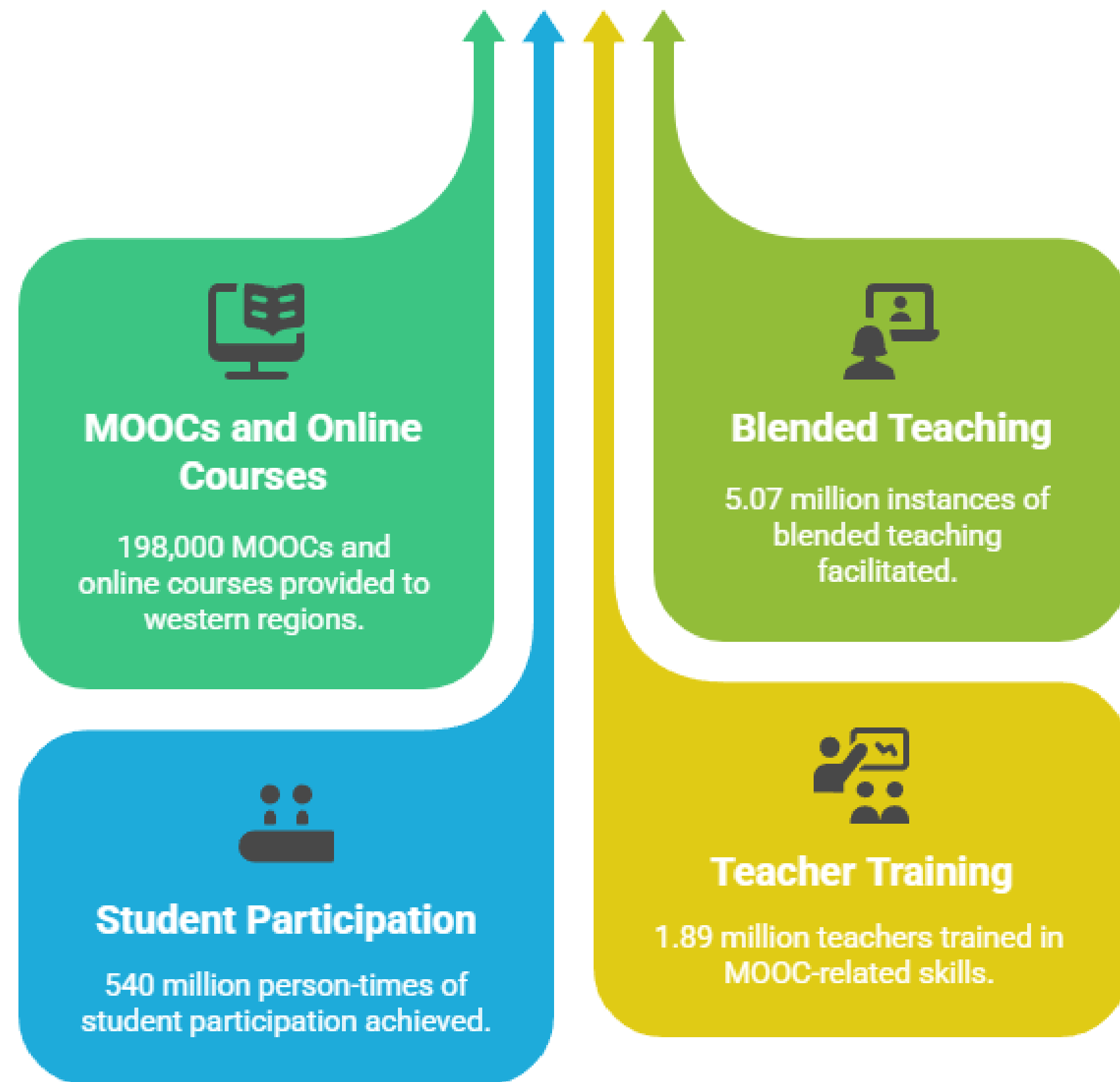Extreme Conditions
(*Sichuan University*)

Virtual Disassembly and Assembly of
Automobile Engines
(*Tsinghua University*)

https://www.ilab-x.com/

Since 2013, China MOE, **"Universities in China Western Promotion Empowered by MOOCs"** initiative, provides STEM-related resources, demonstrating China's strong commitment to advancing equitable online learning.

As of 2025, the Smart Education Platform of China (smartedu.cn) offers over 31,000 MOOCs for higher education, including more than **8,000 online STEM courses and 346 available in English.**

MOOCs and Online Courses

198,000 MOOCs and online courses provided to western regions.

Student Participation

540 million person-times of student participation achieved.

Blended Teaching

5.07 million instances of blended teaching facilitated.

Teacher Training

1.89 million teachers trained in MOOC-related skills.

2900+

Science

Study of natural and physical phenomena

1800+

Technology

Application of scientific knowledge for practical purposes

3900+

Engineering

Design and construction of structures and systems

300+

Mathematics

Abstract study of numbers and quantities

1 Establish a cloud-based, AI-adaptive platform incorporating OERs, and partner with LDCs universities to set up learning centers that support learners and co-award recognized certificates.

2 Design on-demand curricula and introduce flexible enrollment modalities, utilizing appropriate technologies to ensure that online STEM education is accessible, affordable, adaptive, and engaging.

3 Deliver capacity-building in digital literacy and digital pedagogy for educators, administrators, and policymakers, initiate low-cost online STEM pilots to strengthen implementation and foster acceptance.

4 Strengthen cross-national, multi-sectoral partnerships to enhance policy dialogue, resource sharing, credit recognition, and financial support, laying the foundation for a standard digital education framework.

Thank You for Your Attention!

https://sli.bnu.edu.cn