GOVERNMENT OF MONGOLIA

MINISTRY OF EDUCATION, CULTURE, SCIENCE AND SPORTS

ADB

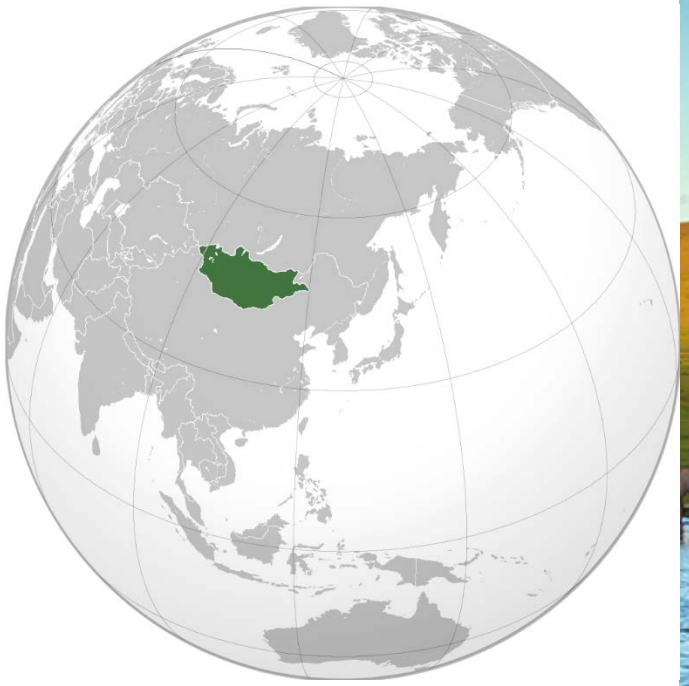
STEM Education in Mongolia

Regional STEM Symposium, Bangkok, Thailand
27-30 May 2019

Topics for Today

- Brief information about Mongolia
- STEM Curriculum
  - Education system
  - Curriculum innovation
- Teachers
  - Teacher training programs
- Project promotions for STEM education

Mongolia – The land of eternal blue sky.



Mongolia is 18th largest country in the world

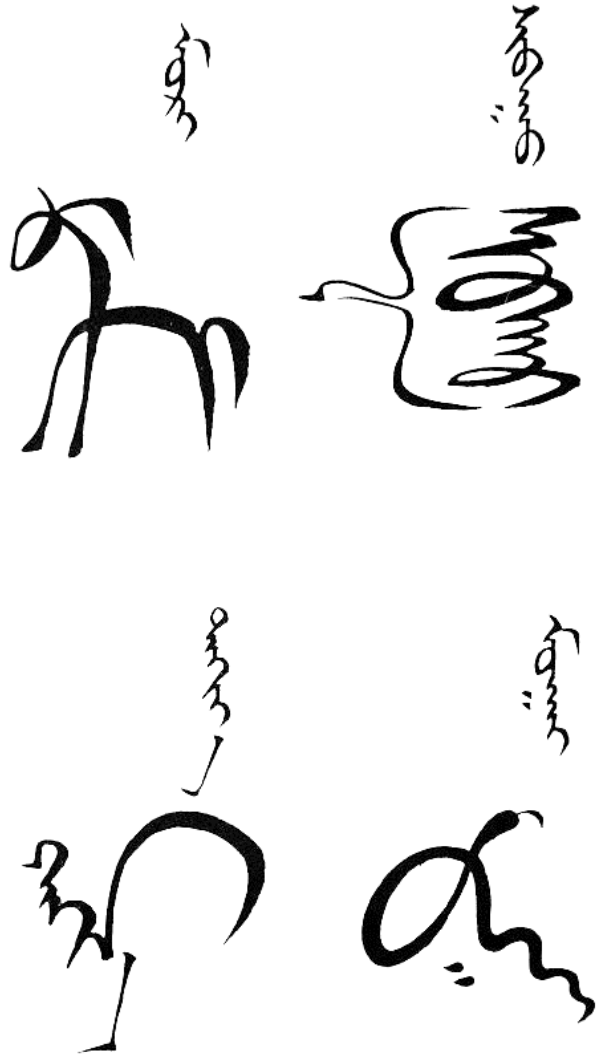
Traditional nomadic lifestyle.

Ulaanbaatar is the capital city.

Traditional puzzle games

General Information

Country:	Mongolia	
Population size:	3,238,479	
Land Area	1,564,116 km2	
Natural conditions	Four seasons (- 50°C ; + 50°C)	
Size of K-12 population:	2019	572,752 F-286,014
Main foreign language(s) taught:	Russian	English
Schooling survival rates (K-12):	81%	
% of students who pursue tertiary education:	85,4%	
Schooling Gender ratios:	2:1	M-286,738 F-286,014
Teacher-student ratios:	1:20	Student-572,752 Teacher-29,242

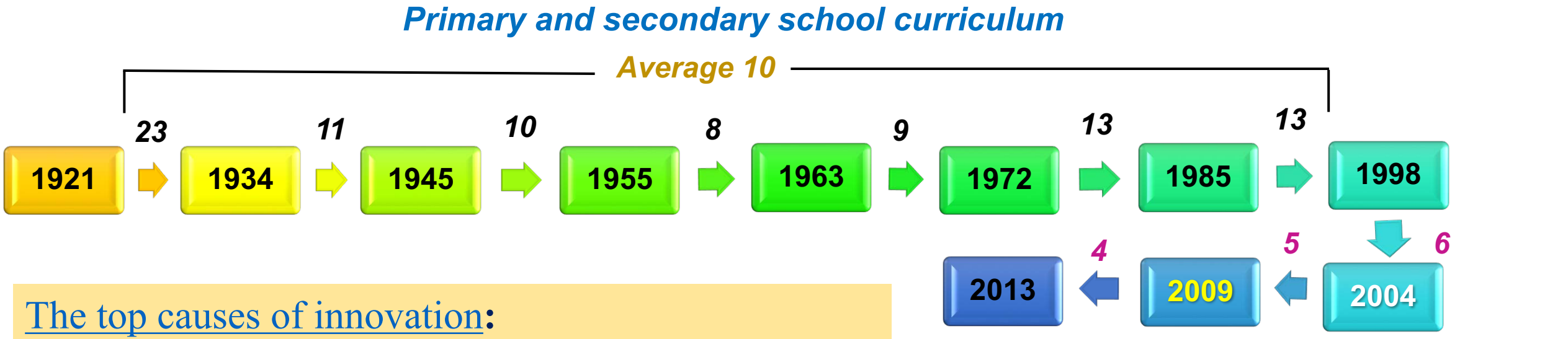


Resource:
National Statistics office of Mongolia http://www.en.nso.mn/
Education sector information system web site https://www.esis.edu.mn/

Education system

	Education	Curriculum	Grades	Age	Years
1	Pre-school education	Pre-school education curriculum		2-5	4
2	Primary education	Primary education core curriculum	1-4	6-10	5
3	Basic education	Basic education core curriculum	5-9	11-14	4
4	Secondary education	Senior secondary education core curriculum	10-12	15-17	3
	Vocational education	Competency based curriculum	10-12	15-17	3
5	Bachelor's	Different curriculums for every university			4
	Master's				2
	Doctorate				3-4

K-12 curriculum innovation timeline



The top causes of innovation:

- *World tendency (Quality Education)*
- *New requirements for socio-economic development*
- *Changes in the structure and system of general education schools*

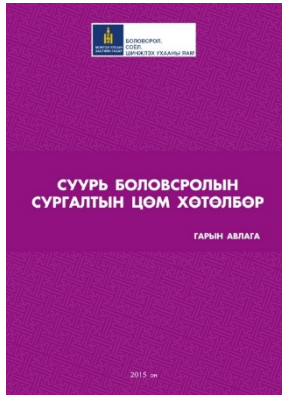
K-12 curriculum innovation timeline

Education Level	Curriculum	Curriculum innovation
Primary Education	Primary education core curriculum	2014
Basic Education	Basic education core curriculum	2015
Senior Secondary	Senior secondary education core curriculum	2016

ISSUES

Developing core curriculums with national features and align with internationally recognized curriculums

- The phase of curriculum Cambridge
- Tendency of the educational goals of science (Scientific competence, Scientific literacy)



STEM part of national curriculums

Education Level	Imp Level	National K-12 curriculum			
		Objective	**Content**	**Methodology**	**Tools** (Equipment)
Primary Education	Piloting	Scientific enquiry	Mechanic and Static models (Bridge, car, cranes etc.)	Integrated methodology (Math, Mongolian language, Human and Science, Design and technology)	• Artec • Fischertechnik
Basic Education	-				
Senior Secondary	Piloting	Scientific enquiry	• Modern physical technology • Electronics • Digital electronics • Applied mathematics • Media design • Nanotechnology	• Interdisciplinary • Student-Centered • Active learning • Inquiry based learning • Intentional teaching • Playful and Challenging • Teaching ICT based chemistry	
Higher Education at MNUE	Starting	Scientific enquiry	Mechanic and Static models (Bridge, car, cranes etc.)	Integrated methodology (Math, Mongolian language, Human and Science, Design and technology)	• Artec • Fischertechnik

21 century skills at the SSE core curriculum

STEM subjects

Chemistry	**Physics**	**Design and technology**
Learning strategy • Team work • Course work • Creation • Investigation • Experimentation	Teaching and Learning strategy • Task based Learning Models • Learning to solve problems model	Planning methodology • Creative thinking

Teachers (K-12)

Total number of teachers:	31,772
% of Teachers with Master's Degrees and above:	4621
% of Teachers with a Bachelor's Degree	22,888
% of Teacher with less than a Bachelor's Degree:	3809
% of teachers teaching at least one STEM subject (i.e. Science, engineering, Technology, Mathematics)	5016
Regardless of the property type, provided professional development trainings to preschool and secondary school teachers' every five years using state budget. /Article 40.8, Law on primary and secondary education/ Institute of Teacher's Professional Development organize nationwide retraining courses for teachers.	

Aim of MNUE curriculum: *Curriculum aims to prepare teachers and educational staff who have the basic scientific knowledge and theoretical and methodological skills for developing him/herself further and organize* ***scientifically*** *training activities.*

Schools and departments	Teacher training Curriculums	Credits	Duration (Year)
School of Mathematics and Natural Sciences	Mathematics, Physics, Biology, Chemistry, Informatics, Geography, Health Education, Ecology "Integrated methodology" 2 credits/ Elective	123	4
School of Humanities and Social Sciences	Social Science, History, Mongolian Language And Literature, Foreign Language (English, Russian, Chinese, German, Japanese)	122-150	4
School of Educational Studies	Psychologist, Lifelong Education, Special Needs, Social Worker	122	4
Teachers school	Primary Education Teachers, Music Teacher, "Integrated methodology" 2 credits/ compulsory	122-124	4
School of Fine Arts and Technology	Fine Art, Cartography, Design And Technology	122	4
School of Physical Education	Physical science, Trainer	122-130	4
School of Pre-School Education	Pre-school, Methodologist	122	4
Teachers School in Arkhangai Province	Pre-school, Mongolian Language And Literature, Primary education, Informatics, English, Social worker	122	4

Way for Integration of STEM into national K-12 curriculum

Piloting

- Primary
- Higher

Develop

- Policy note
  - Integration of STEM into national K-12 curriculum

Implement

- Nationwide level
  - Prepare trainers
  - Teacher trainings
  - Prepare tools (equipment)

Project promotions for STEM education

Implementation information	K-12 level		Higher Education level	
Date	2016	2016-2019	2015-2017	2019
Organizer/ Finance	MECSS and ITPD/World bank	“Skills for Employment Project”/ADB	“ Higher Education Reform Project”/ADB	
Level	Nationwide		Mongolian National University of Education	Teacher training university's
Action	Trainings • ToT • Nationwide training	Trainings • ToT • Nationwide training	• Trainings • “Integrated methodology” Teacher training curriculum Handbook develop • STEM Digital lessons /DVD/ • STEM kits /Secondary school under MSUE/ • STEM education training books	• Online training • Distance training • Face to face training
Target group	Primary education teachers (33%)	SSE level STEM subject's teacher (80%)	• MNUE lecturers-188 • General education teachers-44 • MNUE students-213	• Teachers -150 • Student -150

Thank you very much for your attention^^