ICT in Education in Mongolia: Policies and Practices

「工学と国際開発」研究部会，第2回研究会

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Content

* About Mongolia
* Education system of Mongolia
* ICT Policy in Education
* ICT in education practices
  * Major interventions and milestones
  * ICT in education project funded by MEXT
  * Findings of monitoring survey and interviews
* Concluding remarks

About Mongolia

Map of Mongolia

NationMaster.com
http://www.nationmaster.com/country/mg-mongolia

About Mongolia

Education system of Mongolia

Education system of Mongolia

* The education system consists of
  * pre-school education (kindergarten),
  * general education (primary school 1-5, secondary school 1-9, complete secondary school 10-11 or 12), and
  * professional education (TVET and higher education).
* Primary and secondary education is free to all by law.
* Basic education (1-9) is compulsory.

Primary & secondary education

Before	Now
10 years of schooling	12 years of schooling
Enrollment: 8-18 years olds	Enrollment: 6-18 years olds
Compulsory basic education: completion of 8th grade	Types: (primary, secondary only, upper secondary, complex, private & public)
Types: primary, primary & secondary, complete general education)	Funding for state schools: state budget + fee
State owned and funded	Funding for private schools: tuition + state subsidy (per pupil variable costs)
State curriculum	National education standards (2005) provides some flexibility
Teacher centered, theoretical focus	Still teacher centered

Education system of Mongolia

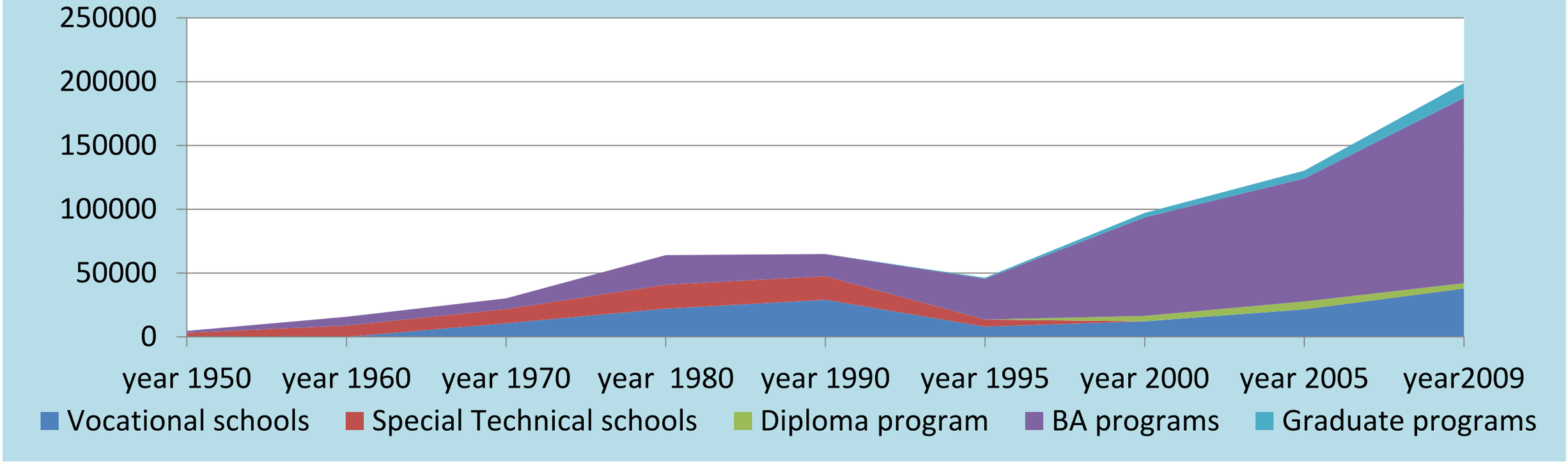
* In 2009-2010 school year, 557346 students were reported to be studying at 710 general secondary schools nationwide.
* **TVET system is in a reform** from supply-driven to a demand-driven, competency-based system
  * New VET law (2009/02/13)
  * Establishment of NCVET (2009/07/01)
  * Government Agency: AVET (2010/04)
  * International programs and projects (ADB, GTZ, MCA-M etc.)
  * Government subsidy to TVET students
  * Increasing investments in improvement of VTPC
  * buildings, dorms, training equipment & materials

Education system of Mongolia

* **Higher Education has been reformed extensively**
  * Decentralization
  * Privatization
  * Introduction of western model of degree-structures
  * External quality assurance system
  * Credit hour system
  * Tuition charge: from 100% state funding to 100% tuition funding
  * State financial aid: loans and grants

Education Enrollment Growth, 1950-2009]

	in Mongolia				
Year	Vocational schools	Special Technical schools	Diploma program	BA programs	Graduate programs
1950		3,186		1,476	
1960		8,811		6,909	
1970	10,628	11,121		8,427	
1980	22,109	18,734		23,214	
1990	29,067	18,478		17,338	
1995	7,987	5,584		31,973	804
2000	**12,177**		4,224	77,281	3,465
2005	**21,574**		6,128	96,504	6,106
2009	**37,867**		4,203	145,196	11,712



ICT Policy in Education

ICT Policy in Education

Government Action Program /2008-2012/

E-Mongolia National Program /2005-2012/

Mongolian Education Master Plan 2006-2015

E-Government Master Plan /2005-2010/

Introduce ICT in educational management

Renovate education standards and curriculums

Develop ICT infrastructure

To improve education quality, access, equity and relevance

The ICT Vision 2015 in primary and secondary education

National program to establish Unified Information and Registration System, 2008

Supply with Computers /laptops

National Program on Distance Education **/2002-2010/**

Develop pedagogy and pre service teaching

Improve ICT infrastructure and maintenance

Broadband development program, 2011

Develop educational software systems, content

Education National Program, 2010-2021

Establish Hi-tech ICT Clustering (Silicon Valley)

Education Sector Development Project

The ICT Vision 2010 in Education Sector

ICT in education policies

Mongolian Government Action plan /2008-2012/

* Renew a national system for continues training of teachers, educational managers skills using advanced ICT and distance learning methods.
* Increase number of computers in schools, supply every teacher with a notebook
* Connect every secondary schools to the internet

e-Government National Program, /2005-2011/

* Campaign on Computer for All;
* Target one computer per 10 students at secondary schools;
* Develop e-education policy;
* Establish multimedia centers for training

Master Plan

* Introduce ICT in rural schools
* Apply ICT in re-training of teachers
* Expand the opportunities of using TV, the Internet and other digital devices within the schools
* Establish centers to provide ICT training and consulting services
* Connect the schools to Internet

ICT in education policies

* **“The ICT Vision 2015 in Education Sector of Mongolia”, /Minister of Education, Culture and Science Order No 450 in 2006 /**
* Create E-information system
* Develop information technology infrastructure
* Create digital educational contents
* Supply with necessary computers and equipment
* Establish information portal sites, information, monitoring & evaluation system and indicators
* **“A regulation of the general secondary school” /Minister for Education, Culture and Science of Mongolia Order No.471/**
* Create a favorable teaching/learning conditions for teachers and students and to create a school website;
* Create a school based information management system
* Introduce ICT and distance learning approaches in the training activities.

ICT in Education: new policy strategic objectives

1: To introduce the ICT for improving the education management

Develop basic ICT knowledge and skills for all; Develop the ICT curriculums of higher education, Promote the national ICT professionals.

Introduce ICT in education planning and management (Open EMIS and School MIS); Develop the web portal for education stakeholders

4: To improve the ICT literacy for all

Quality
Accessibility
Equity of
Education

2: To integrate ICT in teaching/ learning

Secure the sustainable management and financing of ICT in education sector; Integration of ICT infrastructure of educational organizations.

3: To provide maintenance and technical support of ICT

Introduce ICT in pre service and in service teachers' training; Develop the ICT related education curriculums and facilitate educational software tools; Establish the Academic network

ICT in Education practices

ICT in education: major interventions & milestones (Selected)

* **Sakura project /2003-2004/**: A total of 48 rural schools in 16 aimags (province) were provided with 388 computers and the Linux system was introduced.
* **"Introduction of IT to improve rural education"** project IIREM/2004-2006 он/
* city, aimag, remote rural soums (county): 45 schools
* one notebook per school, related peripheries
* teachers started using emails for communication and other related software and
* CDROM, exchange experiences, acquire new pedagogy approaches
* **Standard for Informatics education** /1998, 2004/
* **"Erdemnet" network with academic purpose /2000/**
* National Educational Distance Learning system /2004 /
* **Improving knowledge and skills of English teachers using ICT** / computer laboratory with 20 computers for every 192 schools /

Sustainable ICT use in education: Introducing technology to assist teacher professional development

* Funded by MEXT
* Duration: 1st phase 2010-XII to 2011-III
  2nd phase 2011-V to 2012-III
* Implemented by Tokyo Tech and MSUE
* Objectives:
  * Develop quality training materials for primary school teachers to improve quality of education in Mongolia;
  * Facilitate blended utilization of ICT and traditional tools for teacher training including VCD, Web-based materials and other feasible means.

Background

International Context

1. MDG:

- Achieve universal primary education (Goal 2),
- 'Developing a global partnership for development' (Goal 8)
  - Make available the benefits of new technologies, especially ICT (Target 18)

2. UNESCO Policy:

Enhance ICT use to increase access to and improve quality of learning and support teacher professional development

- Beijing Declaration of the E9-Ministerial Review Meeting (2001),
- UNESCO Bangkok report 'ICT for Literacy' (2008) and
- Regional Ministerial Forum on ICT in education (2010)

3. HDI by UNDP

- Mongolia's low ranking: 126th in 2009
- Caused by, in particular, delayed ICT policy

Background

Domestic Context

1. **Mongolia Education Laws and Master Plan (2006):**
   - Decentralization of school management
   - Introduction of ICT as a tool to improve and
   - Maintain quality sustainable way to promote education development and HRD

2. **Tokyo Tech experience in Mongolia (2005-2009):**
   - Development of teacher training materials in 9 subject areas with use of ICT; ‘
   - Baseline survey on ‘ICT use in Education’ : 80% of primary school teachers want VCD and guidelines
   - Newly developed web-portal for teacher training : lack of content development & maintenance capacity

The project objectives

Goal:
To improve the skills of primary school teachers in Mongolia by developing, trial testing, and evaluating teacher training materials using ICT

Project Activities

1 Investigation of current ICT use in education in Mongolia
- Document analysis
- Interviews and discussions
- Findings summary and recommendations

2 Development of VCD teacher training materials and guidelines in 6 main subject areas

3 Analysis of teacher training web portal and development of prototype interactive materials

4 Teacher training
- Trial testing and evaluation of new material
- Teacher training using the cascade model

The project objectives II Phase

Goal:
To improve the skills of primary school teachers in Mongolia by developing, trial testing, and evaluating teacher training materials using ICT

Project Activities

1. Development and Production of Teacher Training Materials:
   - VCDs in 5 subjects
   - Teacher Guide -2

2. Training activities
   - Training for primary education specialists
   - Teacher training in 3 provinces
   - Trial testing and evaluation of new material

3. International Symposium on the use of ICT in education September 14-15, 2012

4. Scratch Program Application
   - Training of teachers
   - Manual development
   - Teachers Competition

Project activities

1 Development of VCD teacher training materials on 6 subjects

- Mongolian Language
- Mathematics
- Human and Environment
- Human and society
- Art and technology
- Teacher-Students relationship (communication)

Content of VCDs

- discussion of new methods in subject teaching
- subject specific instructional techniques
- showcases of classroom teaching

2 Teachers' guideline in 6 subject areas:

- detailed interpretation of new concepts introduced in VCDs and
- novel techniques in primary education
- manuals for using web-based sources materials

Schedule of the Project

Dec, 2010

Mar, 2012

Dec. 15,
Kick-off, work plan, scenario

Jan 17-21, 2011
Piloting VCDs in training of methodologists

March 15, 2011
Completion of teacher training, production of 6 VCDs and teacher guide, reporting to MEXT

May 15, 2011
Kick-off of 2nd phase, work plan, new teams

June 27-30, 2011
Piloting VCDs in training of methodologists

Sep-Oct. 2011
Teacher training in 3 provinces

Sep 14-15, 2011
International Symposium

Dec. 2011
Monitoring mission to 3 provinces, Survey teachers in all provinces

March 2012
Distribution of 5 VCDs, CD and teacher guide, monitoring report, final report

Monitoring Methodology

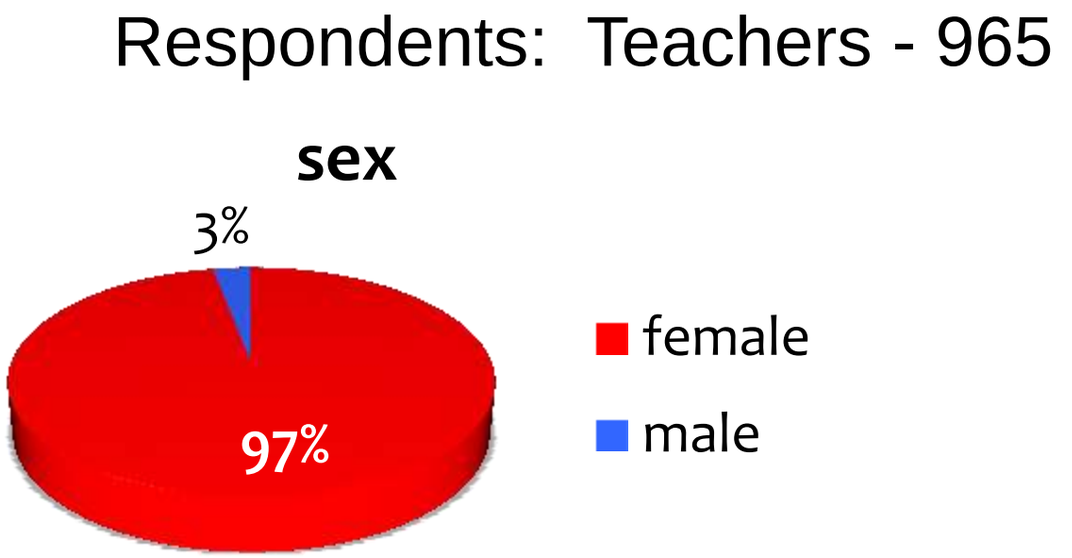
* **Assessment of the use of teacher guide and six VCDs for teacher development in:**
  * Mongolian Language,
  * Mathematics,
  * Human and Environment,
  * Human and Society,
  * Art and Technology and
  * Communication

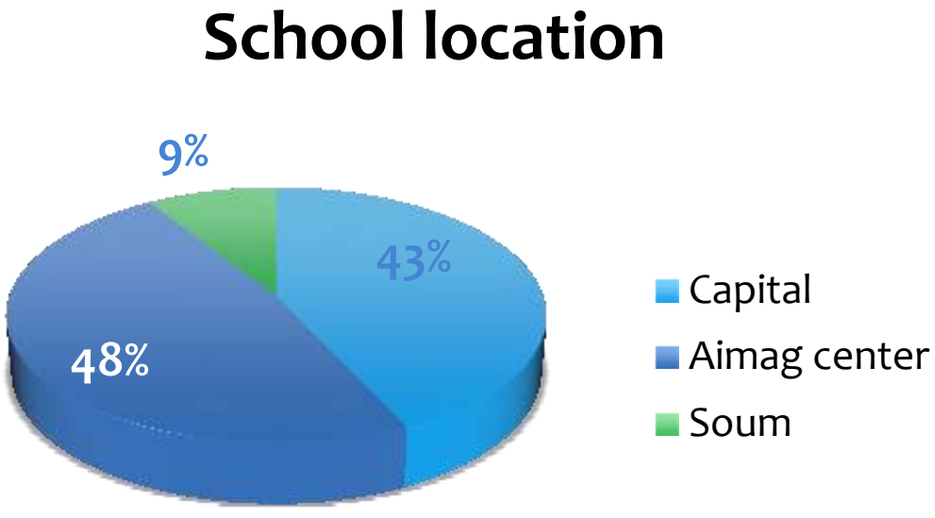
* **Methodology:**
  * **Sample survey:** especially designed questionnaires for teachers covering:
  * demographics of respondents,
  * the use of VCDs including frequency and mode of use,
  * things teachers learned and used for teaching from VCDs,
  * training related to the use of VCDs, if any,
  * the appropriateness of content and methodology,
  * the technical quality of VCDs (duration, audio/sound and visual), and
  * topics/themes should be covered in future VCDs.

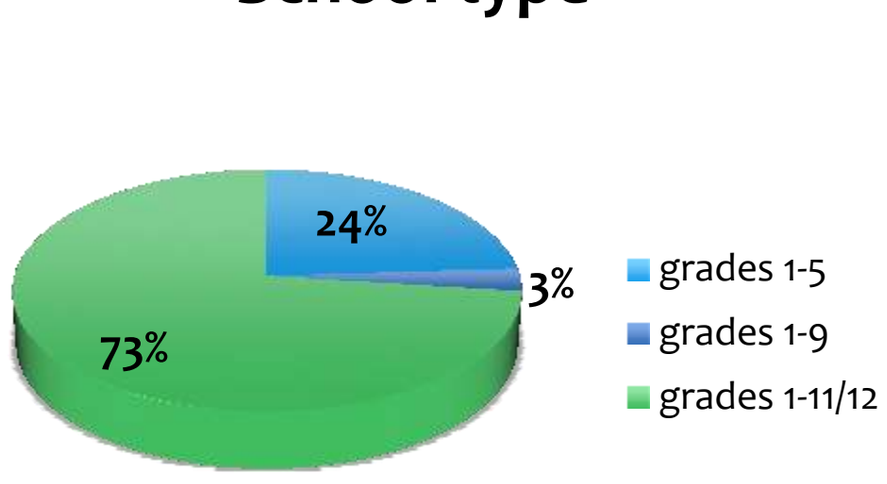
  * **Interviews & Focus group discussions** with teachers, training managers, school principals and primary education methodologists of provincial Education and Culture Department.

Demographic data on the respondents (965)

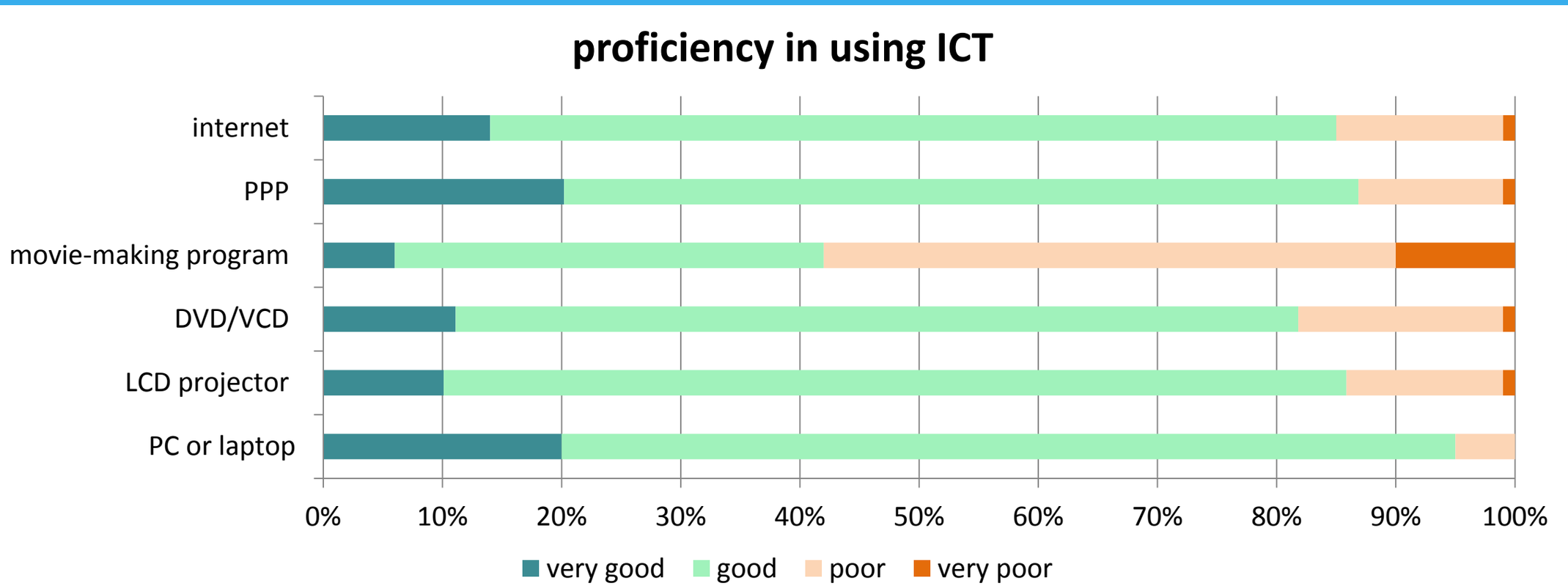
Age	min	21
	max	62
	mean	38
Years of service	min	1
	max	42
	mean	15

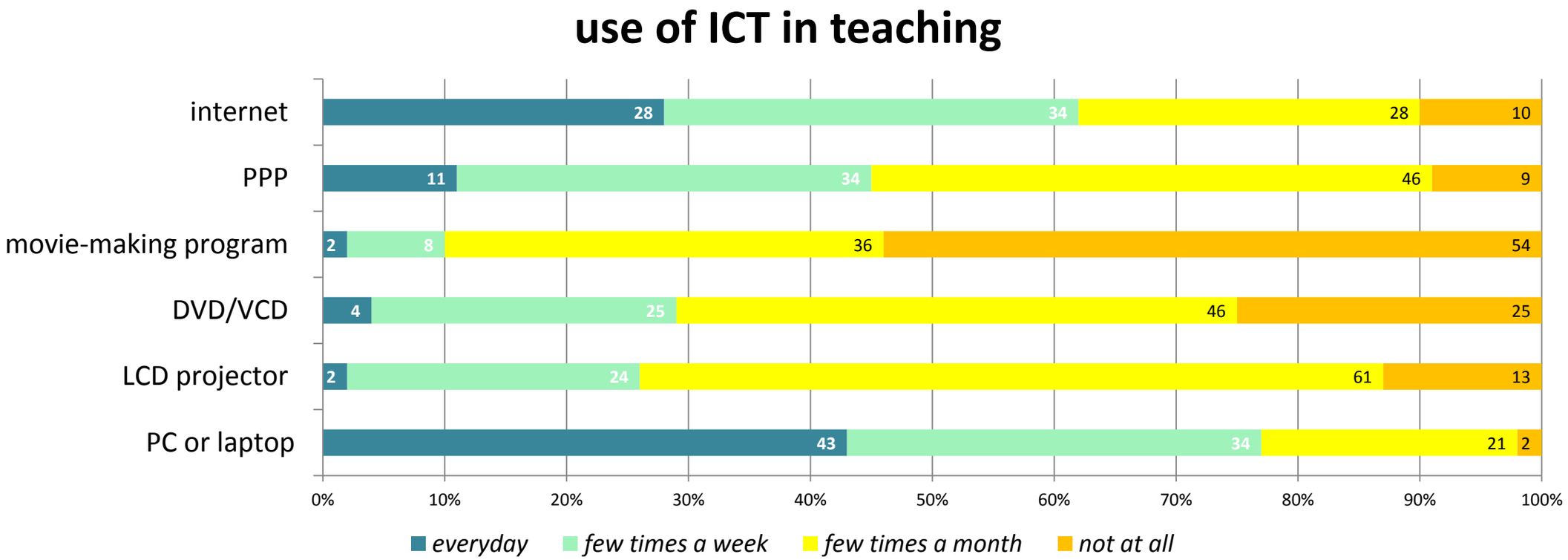






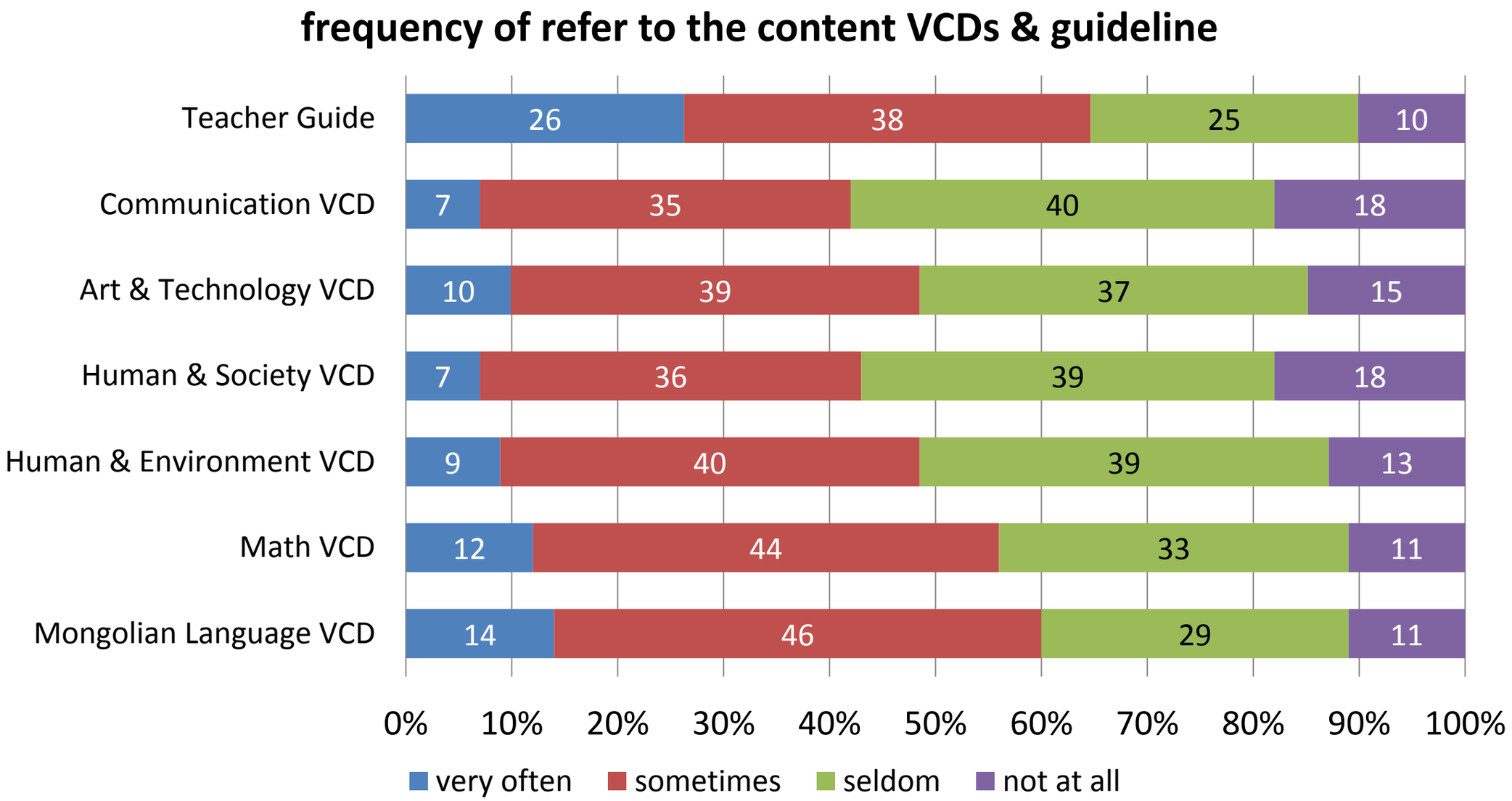
ICT proficiency and use Total of respondents





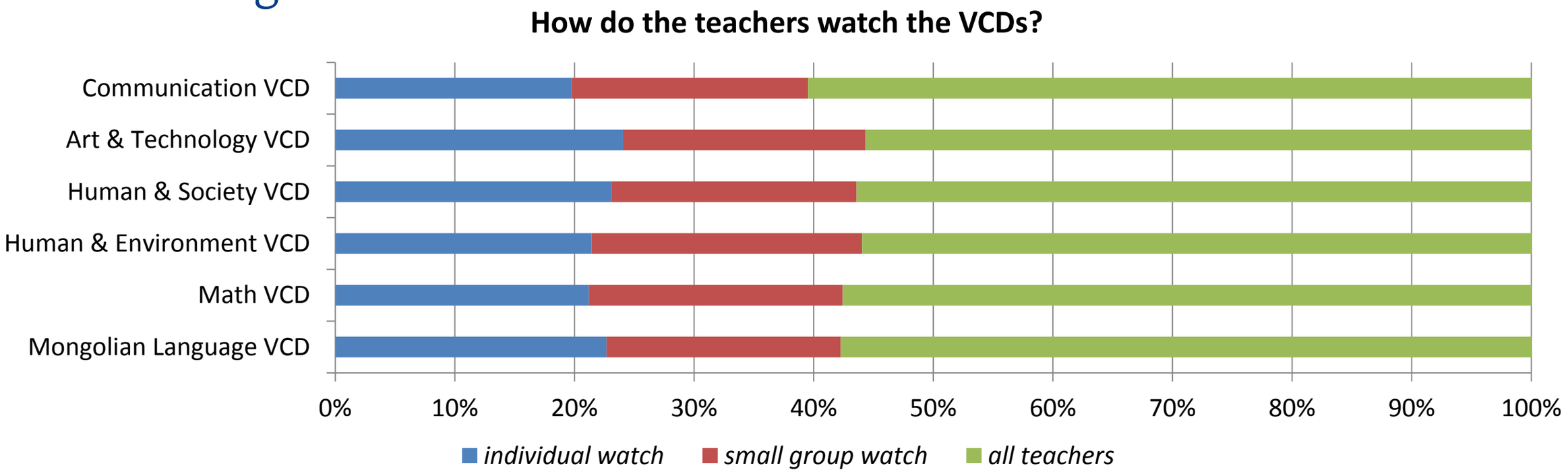
General usage of VCDs & Guideline

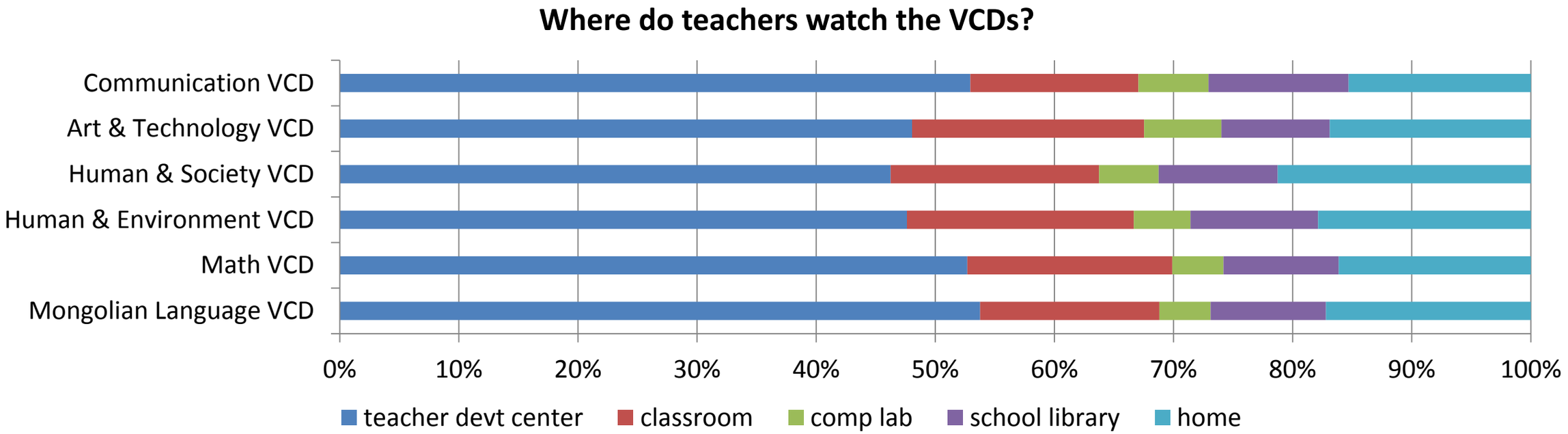
* Majority of the teachers referenced the VCDs quite frequently



Use of VCDs: where and how

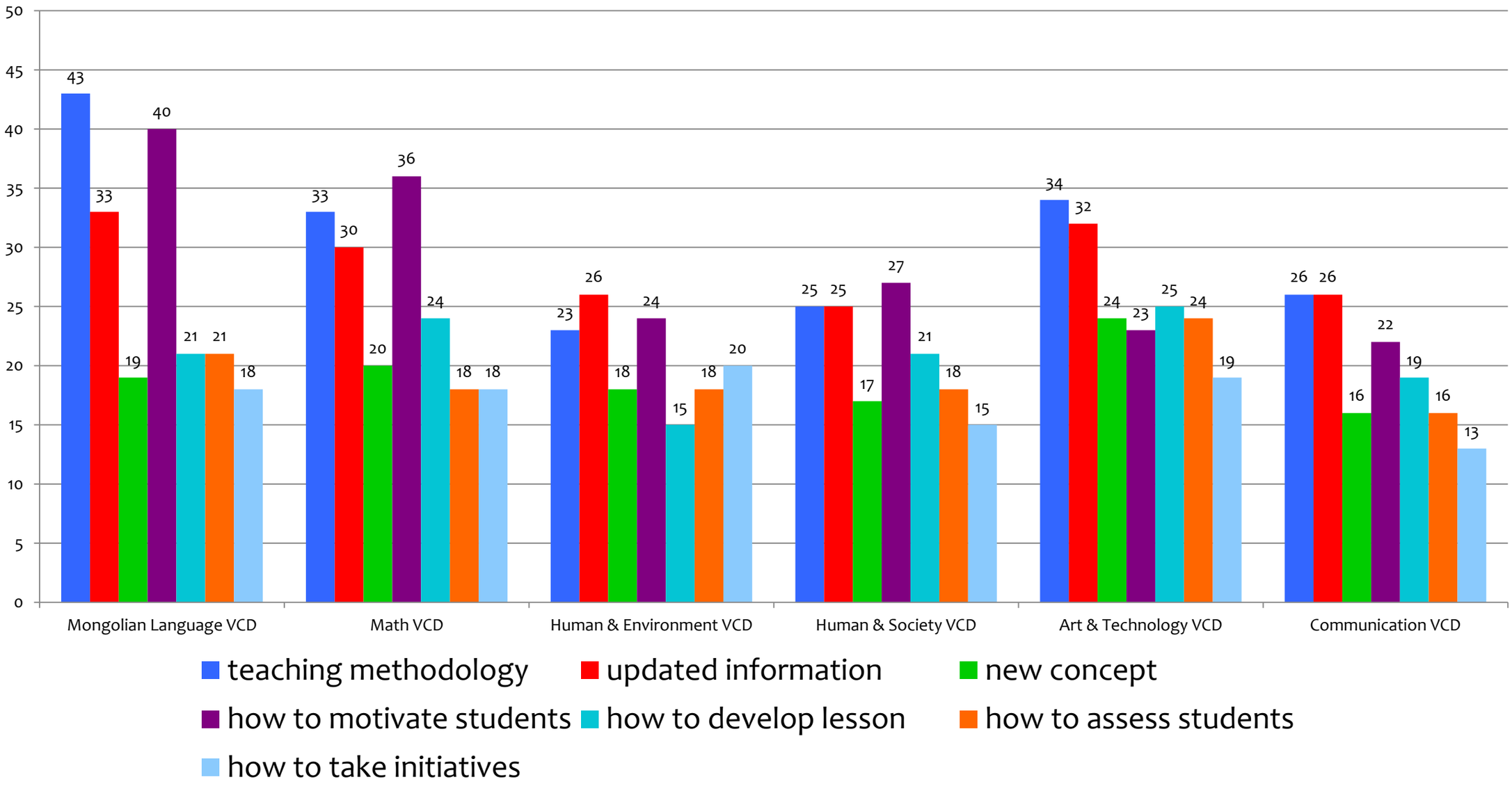
* Majority of the teachers watch the VCDs at school settings in company of their colleagues.





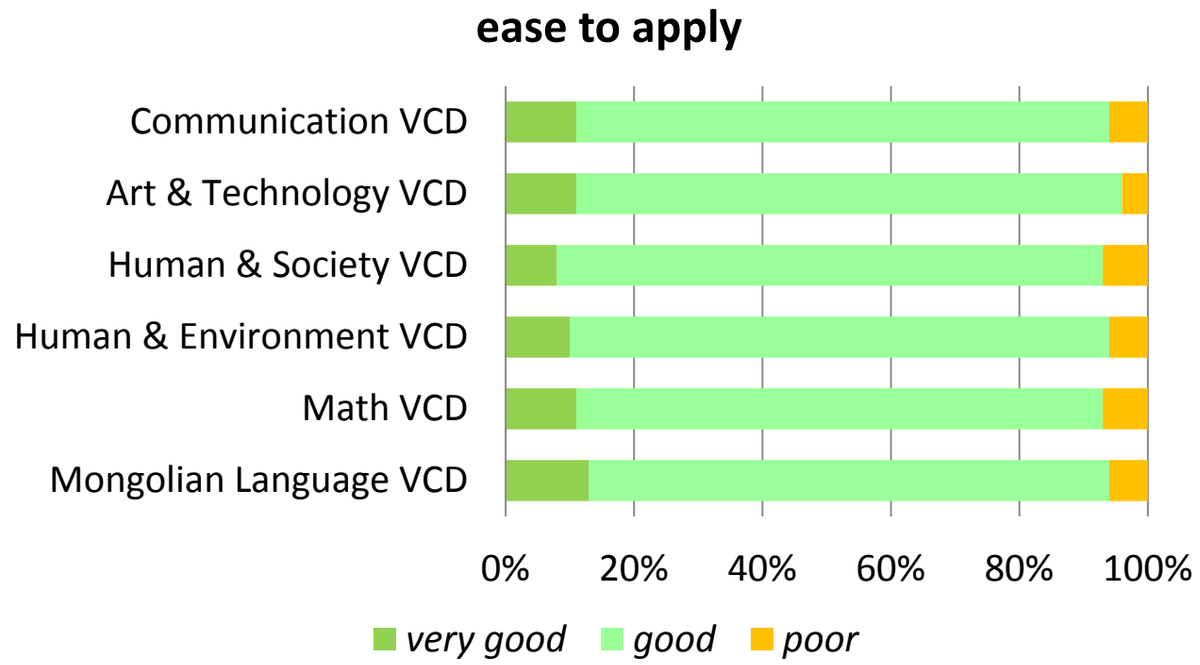
What is learned from VCDs?

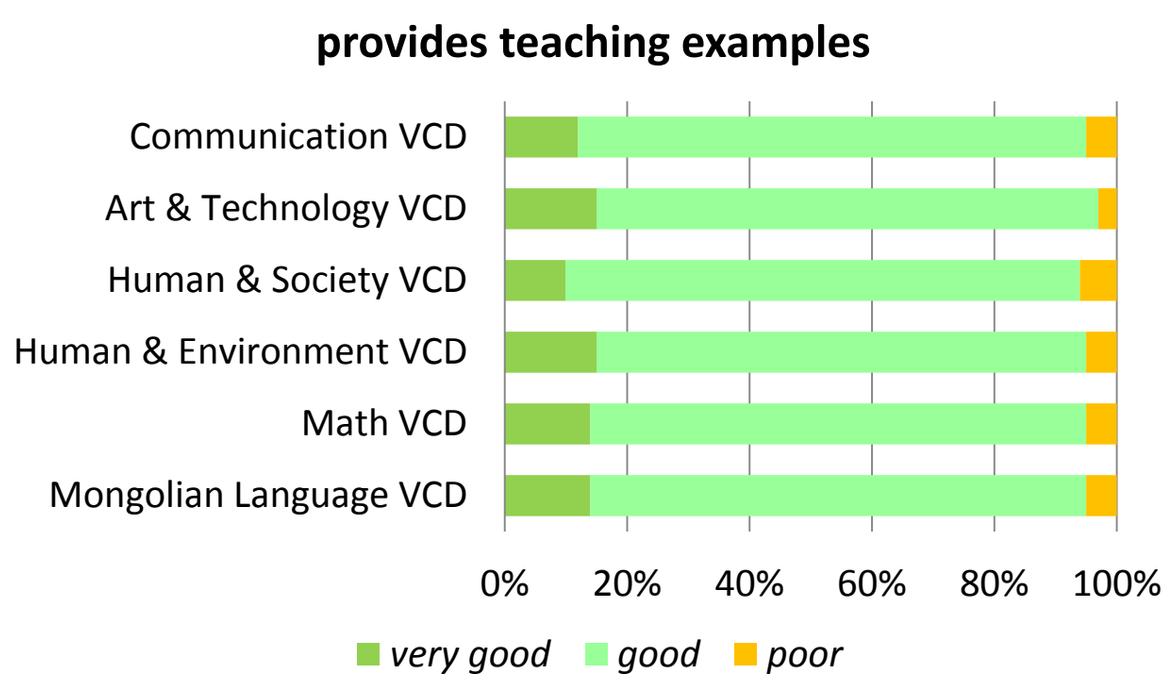
* The VCDs were used as a reference for teacher training in lesson planning, content development and instructional and attitudinal change.

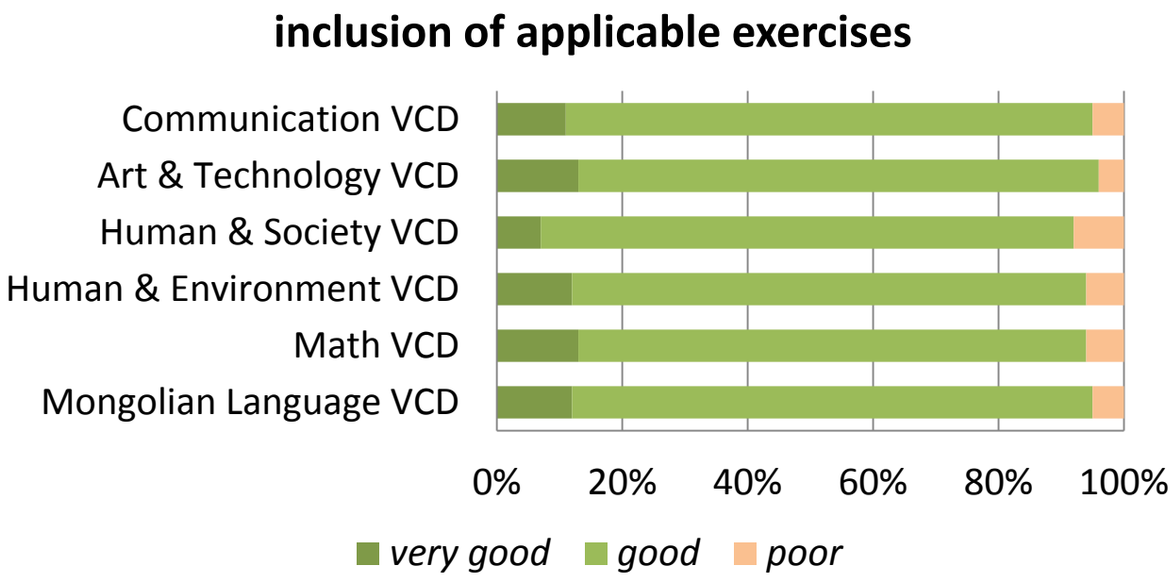


Ratings of the VCDs

* The VCDs were evaluated as a easy and applicable source for teacher development.

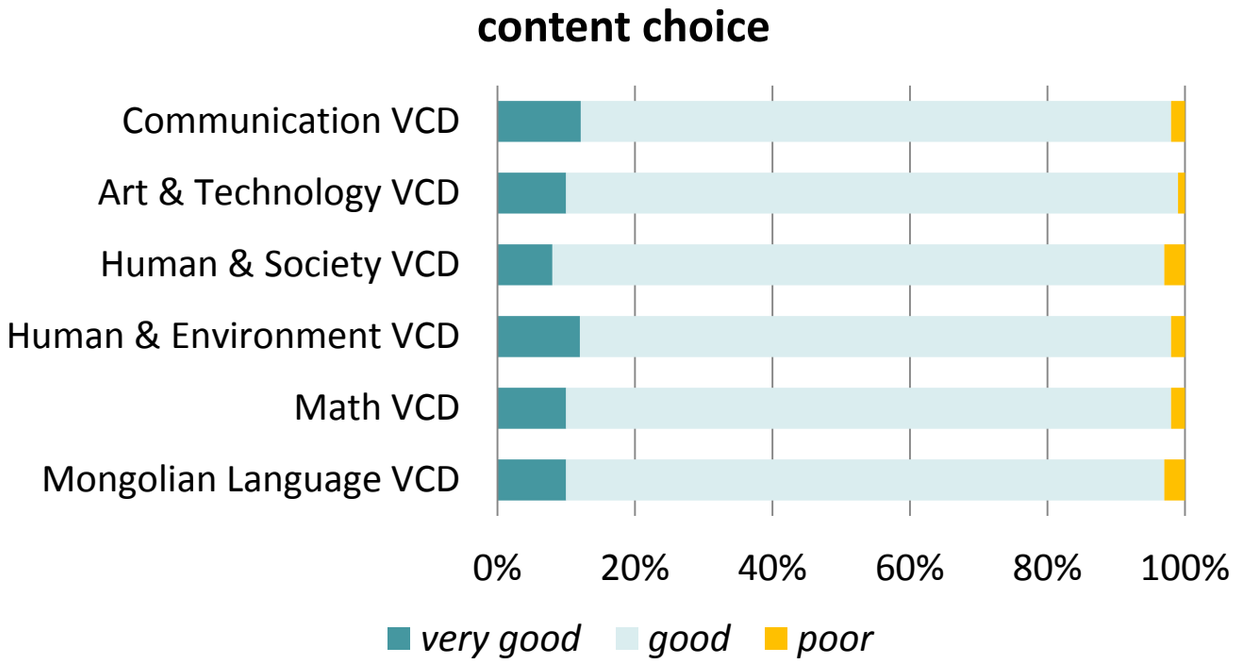


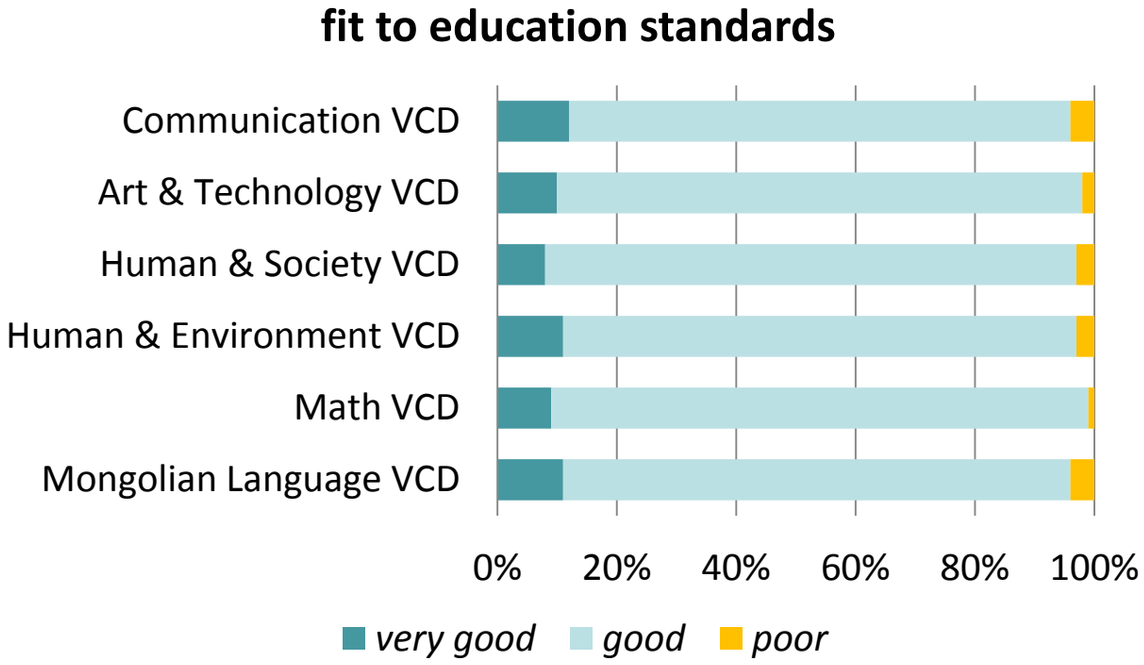


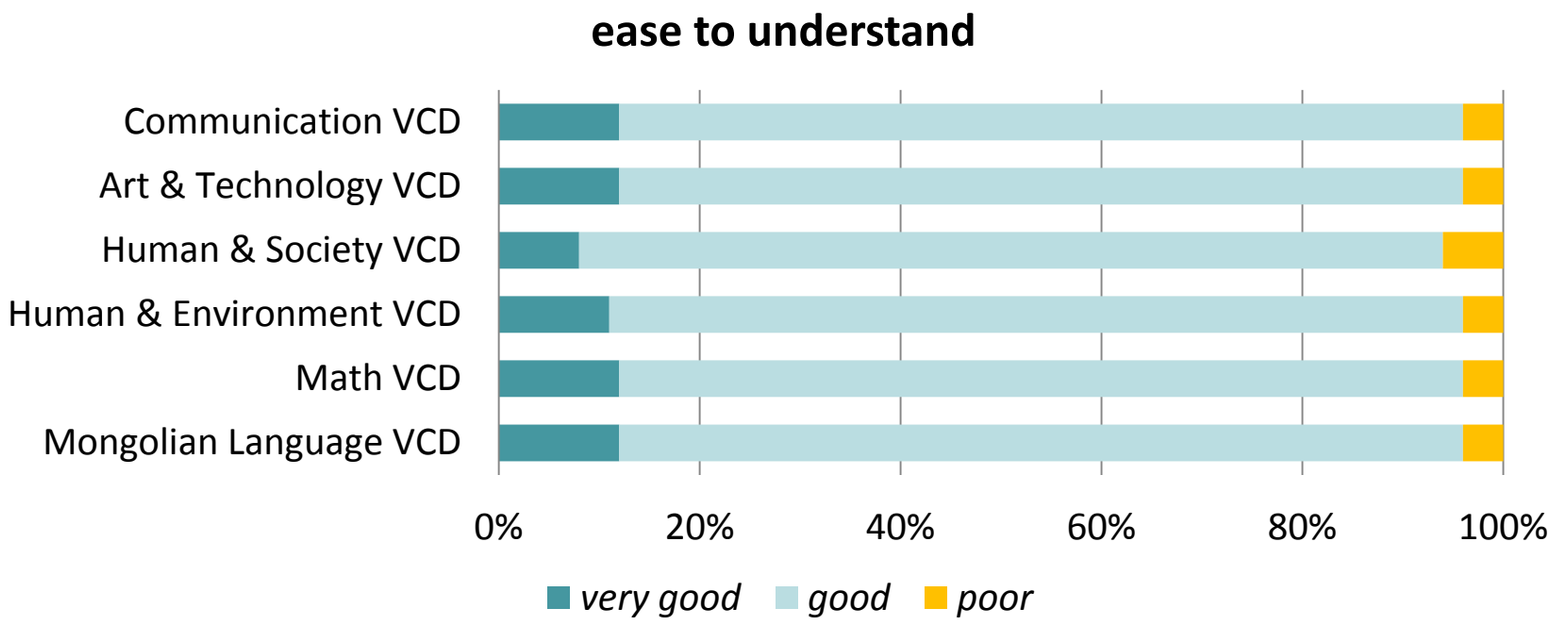


Ratings of the VCDs

* The contents of VCDs were evaluated as a relevant source for teacher development.







Analysis of some relationships

* Relationship between the use of VCDs and the frequency and proficiency of using computer or laptop

* **For all subjects, the use of the VCD contents was enhanced with frequency and proficiency of using computer or laptop.**

  * Significant at 0.001 level positive correlations (r ranges from 0.11-0.18) were observed between the use of VCD contents and frequency of using PC or laptop.

  * Significant at 0.001 level positive correlations (r ranges from 0.11-0.18) were observed between the use of VCD contents and proficiency level of using PC or laptop.

Analysis of some relationships (cont'd)

* Relationship between the frequency of using VCDs and location of schools

* **Aimag center teachers use the VCDs more frequently than Ulaanbaatar teachers.**

  * t-test for independent samples means showed that there is a statistically significant (at 0.001 level) difference in frequency of using VCDs by teachers between Ulaanbaatar city and Aimag center.

* **However, there was no significant difference in using teacher guide.**

Analysis of some relationships (cont'd)

* Relationship between location of school and frequency of using computer
* **Teachers from aimag center (M=3.31) and soum (M=3.37) schools use computers more frequently than teachers of Ulaanbaatar city (M=3.03).**
  * A one-way ANOVA test showed the frequency of using computer or laptop differs by location of school $F(2, 997) = 15.413$; $p<0.001$.

Analysis of some relationships (cont'd)

* Relationship between location of school and proficiency of using computers
* **Aimag center teachers feel more proficient with computers than Ulaanbaatar teachers.**
  * Statistically significant ($p<0.001$) difference in the proficiency of teachers using of computer or laptop between Ulaanbaatar and aimag center $F(2, 999) = 15.813$.

* Relationship between the use of VCDs by teachers and training manager's activity after receiving VCDs

* **None of activities of the training managers at the school after receiving the VCDs and teacher guide significantly affected the use of VCDs.**

Some findings of focus group discussions and interviews with ECD directors, methodologists, school principals, training managers and teachers

Interview findings

* **Increase of motivation:** Project increased teachers' motivation for ICT use and strengthened team work sprit among teachers
* **Reflecting New Education Standard:** Content and presentation style are aligned well with education reform process, education standards and the goal of promoting student-centered learning
* **Attitude Change:** The project contributed to changing the way of teaching with introducing new methodology and creative thinking
* **Need for Equipment:** Gap of technological capacity among rural schools exists and more ICT equipment are needed

Interview findings (cont'd)

* **Upgrading Skills:** VCDs and guidelines upgraded teachers' methodological and planning skills
* **Student Motivation Increased:** The student-centered learning methods introduced in the materials increased students' motivation for learning
* **Increased collaboration:** Good teaching material shared among teachers promoted network and collaboration
* **Cost Effectiveness:** Teachers appreciate VCDs as a cost effective tool for their professional development

Concluding remarks

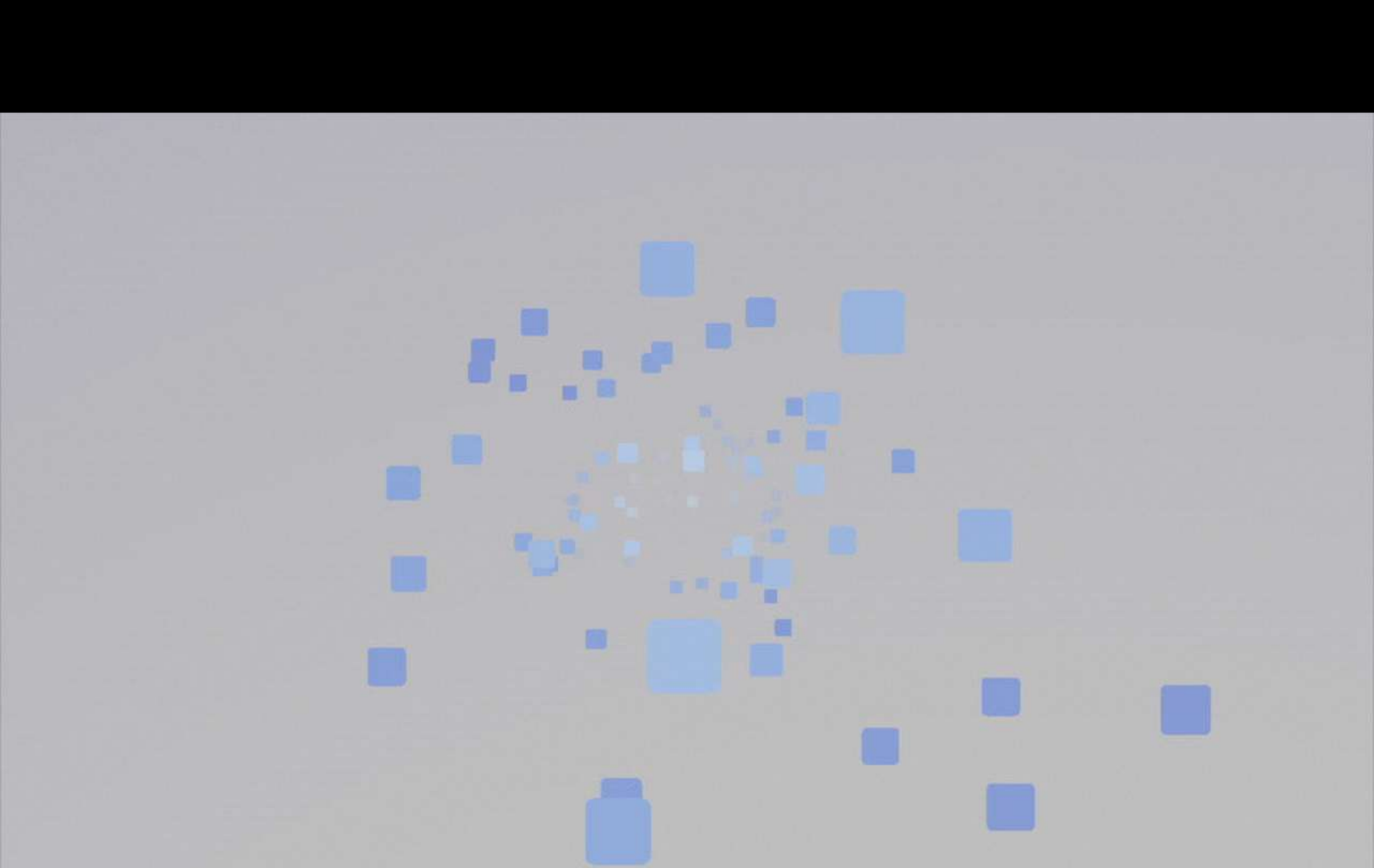
Concluding remarks

* **There is a positive outcome** of this project: The materials contained high-quality content that allowed teachers to improve on their classroom delivery of primary education.
* The student-centered learning methods introduced in the book allowed teachers to create **a variety of teaching materials** that resulted in higher student motivation to learn. Teachers created lots of teaching material and improved their professionalism at the same time.
* The use of the material was further **reinforced through Aimag-level teaching material competition**.

Concluding remarks (cont'd)

* The findings of the survey suggested that all the VCDs, regardless of subject matter, **served as valuable resource material for teachers.** Teachers learned new **teaching methodology, how to motivate students and new information.** Teachers also found VCDs highly recommendable to others and easy to apply due to its teaching examples and applicable exercises. Project produced teacher guide meets its purpose to serve primary teacher development needs.
* The conclusion is that the **development of training materials for teachers using ICT can be an effective way** to encourage wider use of ICT in education for the improvement of the quality of teaching and learning in primary education.

Concluding remarks (cont'd)

* **The ICT in education policy needs to be updated and approved.** Practical actions for its implementation should be planned and integrated with the activities of educational institutions.
* Although the conditions of ICT infrastructure at the school level are improving, **the use of ICT still needs to be integrated with the teaching and learning processes**.
* There is still **a shortage of digital educational contents** for the use of both teachers and students.
* **Application of FOSS** such as scratch provides more opportunities for teachers focus on **student-centered approaches.**

* Thank you for your attention!
* Questions?