Analysis of ICT Use in Primary Education in Mongolia
Current Applications and Lessons Learnt

Shunobu Yume Yamaguchi
Jun-ichi Takada
Tokyo Institute of Technology
Sept. 14, 2011
1. Current condition of ICT use in primary schools
   1. Infrastructure
   2. Teachers’ perception
   3. Issues raised

2. Sustainable ICT use in education: Developing teacher training material using ICT
   1. VCD as presentation medium
   2. Interactive software

3. Summary and Conclusion
ICT Use in Primary Schools

EFA-FTI* Project for primary school teachers

- Develop teachers’ self-learning skills
- Provide ICT equipments (Laptop PC and LCD projector) to majority of schools

(* EFA – Fast Track Initiative, 2007 –)

Project monitoring

- Assess actual application of ICT in classroom and teacher training impact
- October – November, 2009
(Source: produced by monitoring sub-team using http://www.ub-mongolia.mn/map-mongolia.html)
## Project Monitoring

<table>
<thead>
<tr>
<th>Aimag</th>
<th>Questionnaire</th>
<th>Group interview</th>
<th>Interview</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Teacher</td>
<td>Teacher</td>
<td>Parents</td>
</tr>
<tr>
<td>Bayan-khongor</td>
<td>57</td>
<td>58</td>
<td>83</td>
</tr>
<tr>
<td>Selenge</td>
<td>90</td>
<td>48</td>
<td>71</td>
</tr>
<tr>
<td>Bayan-Ulgii</td>
<td>37</td>
<td>52</td>
<td>16</td>
</tr>
<tr>
<td>Dornod</td>
<td>46</td>
<td>46</td>
<td>54</td>
</tr>
<tr>
<td>Umnugobi</td>
<td>41</td>
<td>43</td>
<td>3</td>
</tr>
<tr>
<td>UB City</td>
<td>160</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>431</strong></td>
<td><strong>247</strong></td>
<td><strong>227</strong></td>
</tr>
</tbody>
</table>
Many schools are equipped with Desktop PC, Laptop PC and LCD projector.

In UB, much fewer schools are equipped with Laptop PC.
Many teachers have opportunities to use a computer and LCD projector in aimags.

Less teachers have opportunities to use LCD projector in UB.
There is no correlation between ‘constant electricity’ and ‘Internet connectivity.’
Higher ratio of UB teachers have home PCs.

More than 90% of teachers use home PCs for class preparation.
Results of 4 categories of many questions (excerpt)

1. **Confidence**
   - ICT can improve my professional skills (UB 87.7 % / aimag 96.7 %).

2. **Motivation**
   - It is good for teachers to learn to use new technology in class (UB 86.8 % / aimag 94.0 %).

3. **Readiness / Acceptance**
   - ICT can increase students’ motivation (UB 91.5 % / aimag 95.4 %).

4. **Perception of others**
   - I feel that parents and community members expect school to stay up to date with the technological development (UB 90.2 % / aimag 90.2 %).

Teachers are confident, motivated and ready to use ICT in class, and they feel big expectation to do so by many other people.
Lack of equipments, teaching materials, electricity (Aimag) and internet (UB) are major problems.
Participation and understanding of students are improved by introducing ICT in class. Former is more obvious in aimag, while latter in UB.
Change of Teachers after Introducing ICT in Class

- My teaching has been improved
- Students like my class more
- Students concentrate more on my class
- I am more proud myself
- Parents and community respect more
- School admin respects me more
- I won for competition
- My salary has increased

Teachers are confident with improvement of teaching by introducing ICT in class.

UB (N=123) Aimag (N=263)

But self evaluation is not yet so high. More time is needed for higher self evaluation.
School Encouragement of Using ICT

School provides technical help (aimag)

School provides training (aimag)

School provides financial support (aimag)

Schools try to support teachers using ICT in class, but financial support was available only less than 50%.
Use of ICT in class is very highly expected by parents and community, as well as school administration.
Contents

1. Current condition of ICT use in primary schools
   1. Infrastructure
   2. Teachers’ perception
   3. Issues raised

2. Sustainable ICT use in education: Developing teacher training material using ICT
   1. VCD as presentation medium
   2. Interactive software

3. Summary and Conclusion
Project background

Mongolia

- The population density is low (2 people/km²)
- GDP is 126th at of 177 (WB, 2009)
- Student centered Education is introduced
- Introduction of ICT in education is seen as an important element to improve the quality of education

Challenges on the use of ICT for education in Mongolia:

① Lack of knowledge and technology
② Lack of appropriate materials and contents

Research focus

- Investigates and evaluates the feasibility of introducing effective means of distance education from 2004.
- Training needs assessment on school principles (2008)
- Baseline survey on ICT use in primary schools in Mongolia (2009)

ODA Grant-in-Aid for UNESCO Activities entitled “SUSTAINABLE ICT USE IN EDUCATION: DEVELOPING TEACHER TRAINING MATERIAL USING ICT” is funded to Tokyo Tech by MEXT of Japan, in cooperation with MECS of Mongolia and MSUE (Dec. 2010 – Present).
Various Types of ICT in This Project

2011, January
Ulaanbaatar
Training for Methodologist

2011, June-July
Ulaanbaatar
Training for Methodologist

2011, September
DornoGobi
Training for Teacher

2011, February
Ulaanbaatar, BayanHongor
Training for Teacher

Training medium

Interactive software

**VCD**
Presentation of various teaching activities
  - e.g. model teaching, field work and experiments

**Hot Potatoes**
Web-based self-evaluation of training achievement

**Scratch**
Development of interactive multimedia teaching contents
Production of Training Materials

Guidelines
- Content based on teachers’ concrete questions
- Complementary materials to radio program and VCD

Radio program
- Being aired in May, June (6 times X 2)
- 15-20 min, 6 program and its repeat next day
- Group training is highly recommended
- Contents developed by MSUE and Institute of Education
- 2,500 USD to develop and air program
- Nationwide coverage of the program

VCD material
- Content is 25 min
- 4,500 USD to develop material
- School of Mongolia Language & Art
- 6 subjects, 10 lessons
- Material testing in summer training
- Being aired in May, June (6 times X 2)
- 15-20 min, 6 program and its repeat next day
- Group training is highly recommended
- Contents developed by MSUE and Institute of Education
- 2,500 USD to develop and air program
- Nationwide coverage of the program

Audio cassette material
- 300 copies are to be distributed in June
- Half of schools in Mongolia are to be covered

Needs assessment for teachers
- Baseline survey, May 2004
- Questionnaire for teachers, Nov. 2004
- Additional response from teachers, Dec. 2004

(Source: Tokyo Tech Team, May 28, 2005)
Advantages of VCD

Equipments

- **Availability of VCD player (Interview 2004, 2006, 2009)**
  - No Internet, even no constant electricity, ...
  - Electricity and playing facility can be made available in schools.
  - VCD is found to be most appropriate technology.
    ICT does not necessarily mean PC and Internet!

Usage

- **VCD as supplements of training, not replacement (project evaluation 2006)**
  - Model teaching, field work and experiments, dramas
  - Training in group as well as individual use

- **"One eye-witness is better than hundred hearsays."**
  (= Seeing is believing.)
Development of VCD Materials

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

- **Guideline (book)**
  - detailed interpretation of new concepts introduced in VCDs and
  - novel techniques in primary education
  - manuals for using web-based sources materials
Interactive Software

**Identified interest of local educators**
- Questionnaire in national workshop of ICT in education in Oct 2010
- Interviews with local teacher training specialists
- Reflect on previous questionnaire

**Proposed and tested free software tools**
- Hot Potatoes: Web-based interactive test (http://hotpot.uvic.ca/)
- Scratch: Development of interactive multimedia contents (http://scratch.mit.edu/)
What is Hot Potatoes?

Authoring tool for interactive web-based exercises

- **Easy to operate**: no HTML knowledge
- **Accessible from web browser**: local and internet
- **Mongolian contents**: full Unicode support
- **Free software**: no restriction about usage
### 2. Уттың аяқ

| 1. Дан заах утталған үлгі батаасан бүткүл орнолор. |
| A. ? тәр, өрөй, тәрдіш. |
| B. ? қыз, ыңғая, өрөй. |
| C. ? ұрдеп, әу, дәүер. |

**Оңдың тайлар:**

| Нарықсыз ұсқа таңдай қарай утталау ұсқада қаратаудың зөв қалмаған. |
| 1. құлғаңың қорқалсаң ұг а. қим |
| 2. шыңғының қорқалсаң ұг б. өрөй |
| 3. ғоғоң қорқалсаң ұг в. тәрді |
| 4. өрнің қорқалсаң ұг г. тәд. |
| A. ? тәр 2а 3а 46 |
| B. ? тәр 2а 3а 46 |
| C. ? тәр 2а 3а 46 |

**Оңдың тайлар:**

| 3. Терел уғ ұсқасын бүткүл орнолор. |
| A. ? бүу, бүлдіш, бууд. |
| B. ? ғар, ғары, ғард. |

### Материалдық сурет

<table>
<thead>
<tr>
<th>Позиция</th>
<th>Уткі</th>
<th>Жарықтар</th>
<th>Батық жаттығу</th>
<th>Асуу</th>
<th>Зақау</th>
</tr>
</thead>
<tbody>
<tr>
<td>Жекеше көр</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Оңтук көр</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ырғал</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Бейиндік</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Хат жетіл</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Жекеше көр</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Оңтук көр</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Позиция</th>
<th>Уткі</th>
<th>Жарықтар</th>
<th>Батық жаттығу</th>
<th>Асуу</th>
<th>Зақау</th>
</tr>
</thead>
<tbody>
<tr>
<td>Жекеше көр</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Оңтук көр</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ырғал</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Бейиндік</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Хат жетіл</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Жекеше көр</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Оңтук көр</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Тұрғыдан ұсынылған қызмет, қызмет тіру үшін қажетті қызметтер.
Methodologist and Teacher Training

- **Date:** Jan./Feb., 2011
- **Place:** UB, Bayankhongor aimag
- **Participants:** Aimag ECD methodologists (n=25), primary teachers (n=69)
- **Subjects:** Mongolian Lang., Communication

**Major feedback results**

- Participants were interested in (100 %), felt useful (97 %) and easy to use (86 %) the prototype.
Today, we will study how to say "hello!!" in the world.
What is Scratch?

Programming software for kids (above 8)

– Young students can learn the concept of programming easily
– Developed by MIT Media Lab - Lifelong Kindergarten Group

Characteristics

– Can use Mongolian Language
– Abundant audio and visual materials within the program
– Combine simple instructional “blocks” to create program
  ➢ Characters can walk, can speak etc.
– Import illustration, photos and music
– Can apply to teaching materials !!
Pros and Cons

**Pros**
1. Easy interface: children are target users
2. Easy to learn: can learn the program in 2 – 3 days
3. Good ideas can make interesting samples

**Cons**
1. Incompatible with any other software, e.g. PPT
2. Need of programming knowledge & skills for advanced contents
3. Not always suitable for teaching material production
4. Need editing skills for advanced image and sound effects
Teacher Training

- **Date:** Sept 6-9, 2011 (just last week!)
- **Place:** Sainshand, Dornogovi aimag
- **Participants:** 30 primary teachers from Dornogovi and Govi-Sumber aimags
- **Total time for Scratch training:** 5.5 hours

First training was very well accepted among teachers, and many possible use in classroom are proposed.

29 out of 30 teachers brought their own laptop PCs for training.
1. **Infrastructure:**
   - Schools still encounter lack of ICT equipment, although substantially improving
   - Large disparity exists between aimags, and within aimag

2. **School/Community Support:**
   - Schools support teachers’ ICT use in education by establishing favorable environment for ICT use.
   - Communities expect further promotion of ICT use in education

3. **Motivation:**
   - Teachers’ motivation is high in introducing digital teacher training materials
   - Teachers’ perception on utilizing ICT in teaching is found positive
Summary (2)

4. **Right time!:**
   - Government policy and international projects have a significant influence in ICT use in teaching.
   - Teacher training materials development using ICT meets needs of education sector in Mongolia.

5. **Appropriate technology:**
   - “Appropriate” use of technology into teaching, based on local condition and teachers’ needs, is vital.

6. **Periodical review:**
   - Appropriate use of ICT in education may change according to rapid progress of ICT, and therefore periodical review is crucial.