Student-centred approaches in science and life skills education: What works in Cambodia?

Educaid Conference,
Brussels, December 5, 2013
Outline

- Science, Environmental & Agricultural Life Skills Programme (SEAL)
  - Context of education in Cambodia
  - Outcomes & Impact
  - Challenges & Solutions
75 % of teachers
96 % of university students
67 % of all primary and secondary school pupils

...were killed/starved when the Khmer Rouge was in power.

Long-term Impact on the Education System and Human & Social Capital in Cambodia
<table>
<thead>
<tr>
<th>Education Indicator</th>
<th>Year</th>
<th>Cambodia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net enrollment primary education (%)</td>
<td>2011</td>
<td>98</td>
</tr>
<tr>
<td>Gross enrollment primary education (%)</td>
<td>2011</td>
<td>126</td>
</tr>
<tr>
<td>Completion rate primary education (%)</td>
<td>2011</td>
<td>90</td>
</tr>
<tr>
<td>Progression to secondary school (%)</td>
<td>2010</td>
<td>80</td>
</tr>
<tr>
<td>Overaged primary school attendance (%)</td>
<td>2010</td>
<td>42</td>
</tr>
<tr>
<td>% population 15-24 not complete primary edu. (%)</td>
<td>2010</td>
<td>32</td>
</tr>
<tr>
<td>Pupil-teacher ratio, primary</td>
<td>2010</td>
<td>48</td>
</tr>
<tr>
<td>Pupil-teacher ratio, secondary</td>
<td>2007</td>
<td>29</td>
</tr>
<tr>
<td>Literacy rate, youth total (% of people ages 15-24)</td>
<td>2009</td>
<td>87</td>
</tr>
</tbody>
</table>
## EFA Development Index 2010 (N = 127)

### Cambodia: Quality of Education

<table>
<thead>
<tr>
<th>EDI Component</th>
<th>Value</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. UPE</td>
<td>0.957</td>
<td>59</td>
</tr>
<tr>
<td>2. Literacy</td>
<td>0.739</td>
<td>94</td>
</tr>
<tr>
<td>3. Gender</td>
<td>0.883</td>
<td>97</td>
</tr>
<tr>
<td>4. Quality</td>
<td>0.621</td>
<td>111</td>
</tr>
<tr>
<td>Overall EDI</td>
<td>0.801</td>
<td>100</td>
</tr>
</tbody>
</table>
Teacher Training Programme

Objective: Graduate teachers apply improved teaching methodology

Strategy: Capacity Strengthening of Pre-service Teacher Training for basic education

Pedagogical skills
Child-centred learning
ICT in Education

Science education
Biology, Chemistry
Physics, Earth Science

Life skills
Health, Environment & Agriculture
Teacher Training in Cambodia

- **Teacher training for primary education**
  - (2 years)
  - **18 Provincial Teacher Training Colleges (PTTC)**

- **Teacher training for lower secondary education**
  - (2 years)
  - **6 Regional Teacher Training Colleges (RTTC)**

- **Teacher training for upper secondary education**
  - (1 year)
  - **1 National Institute of Education (NIE)**
Implementation Model

2008 – 2011: Pilot Phase at RTTC Kandal/ PTTC Siem Reap
- Capacity Development of Trainer-of-Trainer Team
- Development of resources
- Quality control

2011 – 2013: Scaling Up to all TTCs
- Capacity Development through workshops, study visits & follow-up activities
- Promoting peer learning
- Publication & dissemination of materials
Target groups

- Student Teachers at PTTCs/RTTCs
- Teacher Trainers at PTTCs/RTTCs
- SEAL Programme
- Pupils at primary schools/lower sec schools

MoEYS central level (TTD), donors, …
Development of Educational Resources

- Instructors’ manuals on student-centred approaches, experiments and agricultural/ environmental life skills
- Science & life skills posters with activity sheets
- Filmed instructions for 185 science experiments
- Interactive multimedia and activity sheets
- Equipment for RTTC science labs (both high and low cost) and low-cost experiment boxes for practice schools
- Logistical support for organic gardens, waste management & fish and chicken raising
Strengthened capacity in science & life skills education

- Teacher trainers of RTTCs and PTTCs
- Management staff of RTTCs and PTTCs
- Science & life skills teachers of 39 lower-secondary & 54 primary practice schools
- 93 directors of practice schools.
- 36 technical staff of provincial Offices of Education (inspection)
Student Centred Approaches
Zero and Low-Cost Experiments
Supporting organic gardens
Use of SCA by science teacher trainers in 2013 (survey data)
Impact on Teacher Trainers: Lesson Quality

Comparison total lesson observation scores 2012-2013

- N: 32
- Average change: +2.38
- % improved: 88%
- % improved > 10%: 63%
Impact on student teachers

Percentage of science teacher trainers providing support on SCA to students during 2012-2013 practicum (n=75)
Challenges for applying SCA by RTTC science teacher trainers (2011-2013, N=75)
Challenges & Solutions

• **Switch to SCA = Paradigm shift**
  - Nature of knowledge
  - Role of teacher and students
  - Complexity of policy language (Schweisfurth, 2011)
  - Culture (high power distance; collectivist) (Berkvens, 2012; Kanu, 2005)

• **Solutions**
  - Set realistic expectations
  - Opportunities to contextualize generic solutions
  - Dialogue which respects target group as active agents
  - Allow sufficient time & opportunities for practice
Challenges & Solutions

• Power & Agency
  – Many factors affect learning outcomes & drop-out rates (assessment, curriculum, inspection)
  – Assumptions of causality

• Solutions
  – Using ‘windows of opportunity’ (e.g. curriculum revision)
  – Fail-safe experiments
  – Prevent premature convergence
    ‘Complex spaces need experts to disagree to increase diversity, rather than a consensus based approach.’ (Snowden and Boone, 2007)
Challenges & Solutions

• Participant bias
  – Response & cultural bias (Berkvens, 2012)
  – ‘Strategic’ responding
  – High-context culture (Hofstede, 2010)
  – Both with quantitative & qualitative data collection methods

• Suggestions
  – Mutual trust reduces response bias (Berkvens, 2012)
  – Focus on obtaining factual information
  – Triangulation to validate data
Challenges & Solutions

• Delayed & Diffuse impact on final beneficiaries
  – Effect on pupils to whom student teachers will teach after graduation
  – Effect on pupils (drop-out rates, learning outcomes) only after few years (beyond programme lifetime)
  – How can we attribute any effects on pupils to the programme?

• Suggestions & Questions
  – Indirect evidence & research literature
  – Quasi-Experiments, ethnographic studies
  – Impact measurement beyond the duration of the programme
  – Integration M&E procedures in partners’ policies
More Information

• **Links**
  
  

• **Contact**
  
  – [Stefaan.vandewalle@vvob.be](mailto:Stefaan.vandewalle@vvob.be) ([@stefaanvw](mailto:Stefaan.vandewalle@vvob.be))
  
  – [Mono.keo@vvob.be](mailto:Mono.keo@vvob.be)