Fiji's Information economy and the role of Information and Communication Technology (ICT) literacy education in the age of Broadband

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(ICT Capacity Building @ USP Project)

The University of the South Pacific: USP
From: http://www.usp.ac.fj/admin/information/almanac/

ICT Capacity Building @ USP
- Funded by JICA, Japanese International Cooperation Agency (Official Development Aid)
- 3 years Technical Cooperation (July 2002 ~ June 2005)
- Estimated Cost US$ 4.5M
- Project Purpose
  "More students can receive improved education service through the enhanced ICT capacity of University of the South Pacific (USP)."
- 3 Components
  1) Computer Science
  2) Distance and Flexible Learning
  3) ICT Research and Training
- Support Multi-disciplinary research linking ICT to practical solutions and applications of socio-economic development of communities within USP's 12 Member Countries.

ICT research
- 2003 Evaluation of Computer Science Curriculum in Fiji Secondary Schools
- 2004 (Printing) Maximizing the Benefits of ICT Multimedia in the South Pacific: Cultural Pedagogy and Usability Factors
- GIS Community Based Tourism Development Project
- ICTs Sustainable Rural Development and Poverty Reduction in the Solomon Islands: PFNet case
- Redefining Telecommunication Legislation and Regulatory Environment in Fiji for Improved Economic Growth and Social Development
- Economic Impact of E-commerce Strategies for the Marketing Small and Micro Tourism Business
- A baseline survey on Free and Open Source Software (FOSS) in the South Pacific: Knowledge, Perception, Usage, Contribution and Potential
- Country-Specific Websites and Cultural Identity Formation: A Case Study

Background of Fiji
- A multi Islands nation in the South Pacific
  - Distant from the major markets
  - High transportation cost
  - Small in population size: less than a million
  - Less diversity for economic development: activities, service, and capital formation such as education
  - Lower middle income (GDP US$2160)
  - Major foreign earnings in 2001: Tourism, garment, and sugar.
  - Formal education as proxy for human capital: Fiji's school enrollment rate: Primary and lower secondary school almost 100 %, Upper secondary: 61, Tertiary: 13.5
  - Hub in the South Pacific Islands Countries
  - Strong incentives to use and benefit from broadband?

“e-Fiji”
- e-Fiji: Vision and plan of information economy and a dedicated agency
- Advantages
  - geographical location (GSM + 12)
  - well-trained workforce, who speak good English.
  - world-class connectivity via the Southern Cross Cable Network (SCCN)
- Disadvantages
  - Monopoly in Telecommunication sector up to 2014
  - High ICT illiteracy rate
- Few research in human capital with ICT literacy
  - Computer Science education at secondary school as proxy
  - Interests from academic staff in Computer Science department especially from foreign countries
  - Request from Ministry of Education
Computer Science Curriculum Research
Methodology and sample

<table>
<thead>
<tr>
<th>Methodology</th>
<th>Sample size</th>
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<tbody>
<tr>
<td></td>
<td>Students (217), teachers (44) and companies and institutes (27)</td>
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</tbody>
</table>

Baseline data mainly from the Ministry of Education’s Statistics Department.

1) Quantitative
- Questionnaire from students and teachers from 82 schools and some agencies

2) Qualitative
- Focus group interviews of stakeholders, teachers and students, using semi-structured questions to obtain in-depth information.
- In-depth interviews of two schools identified as ‘best practice’
- A symposium and a peer review meeting to share the research results and get feedback with some of the stakeholders

Problem identification by Students and Teachers

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Students</th>
<th>Teachers</th>
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<tbody>
<tr>
<td>Lack of PCs</td>
<td>158 (73%)</td>
<td>37 (84%)</td>
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<tr>
<td>Classes too theoretical</td>
<td>130 (60%)</td>
<td>27 (61%)</td>
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<tr>
<td>Student’s attitude</td>
<td>108 (50%)</td>
<td>19 (44%)</td>
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<tr>
<td>Old Software applications</td>
<td>108 (49%)</td>
<td>30 (68%)</td>
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<tr>
<td>PCs often out of order</td>
<td>108 (49%)</td>
<td>28 (67%)</td>
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<tr>
<td>Maintenance of PCs takes long</td>
<td>96 (45%)</td>
<td>35 (80%)</td>
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<tr>
<td>Large classes (40+ students)</td>
<td>91 (42%)</td>
<td>22 (50%)</td>
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<tr>
<td>Old PCs</td>
<td>80 (37%)</td>
<td>25 (57%)</td>
</tr>
<tr>
<td>Students have no access to PCs</td>
<td>79 (36%)</td>
<td>22 (50%)</td>
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<tr>
<td>during CS classes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Little guidance to students</td>
<td>76 (35%)</td>
<td>17 (38%)</td>
</tr>
<tr>
<td>by teachers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of training teachers</td>
<td>72 (33%)</td>
<td>19 (43%)</td>
</tr>
<tr>
<td>Lack of electricity/ frequent</td>
<td>65 (30%)</td>
<td>13 (30%)</td>
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<tr>
<td>power cuts</td>
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<tr>
<td>Little cooperation from parents</td>
<td>54 (25%)</td>
<td>15 (34%)</td>
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<tr>
<td>and senior staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Little priority given to teaching</td>
<td>50 (23%)</td>
<td>9 (20%)</td>
</tr>
<tr>
<td>CS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inadequate facilities to house</td>
<td>41 (19%)</td>
<td>14 (32%)</td>
</tr>
<tr>
<td>PCs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internet connection too</td>
<td>33 (75%)</td>
<td>33 (75%)</td>
</tr>
<tr>
<td>expensive for students to use</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TOTAL 217 44

Result: Three major problems

1) Curriculum
- a strong demand from both students and teachers for a curriculum update, but not from companies and institute

2) Inequities in access
- among students, among schools offering CS education, and among the entire range of secondary schools

3) Teachers’ job security and professional capacity development

(1) Curriculum
- Developed in 1996
- Technology development and environment change for students and teachers
- In the focus group interviews, students were critical of:
  - obsolete description of textbooks such as old hardware
  - teaching styles, such as the traditional one-way lecture style or little practical evaluation
  - ‘boring’ contents that were good for a lower grade level

(2) Inequities in access
- Access is getting better as a whole but divide in:
  - Hardware and software access at home and school
  - Internet
  - CS education
  - Domestic divide in different dimension such as accessibility between city and rural area
  - More international divide influenced by domestic divide?
Refer to Annex 5 for corresponding School names.

Indicates Secondary schools teaching Computer Science
Indicates Secondary schools teaching Computer Science and have Internet connection

Total number of secondary schools in the area

Assessment of human capital with ICT literacy

- Output quantity and quality
  - 30% of cohort in teenagers might access to CS education and half sit down for 7th form certificate exam (a year before tertiary level education)
  - Demand for curriculum and equipment improvement is one criteria to assume quality

- Little demand and concern from employees of school leavers
  - Satisfied with current ICT education?

- Even though little demand from current employees, current education is enough to
  - Prepare for higher level of education?
  - Be a education as future investment?
  - Provide ICT literacy for social development?

- Need to be improved both for quantity and quality

List of recommendations

- Short-term (less than 3 years)
  - Curriculum revision
  - Capacity building in Ministry of Education
  - Universal access to CS/IT studies
  - Improvement of CS/IT Teacher job security/training
  - Improvement of equipment & infrastructure
  1. That an appropriate amount of good quality equipment be installed in schools to allow them to offer IT education;
  2. That opening school computer labs for community use be established as a way to raise money to buy equipment;
  3. That the MOE works with the ICT Regulator to provide Internet access to all secondary schools at a special or free rate;
  4. That the Government provides meaningful support in infrastructure development, including Internet access for staff and students
  - Capacity development of school Principal & Management
  - Networking amongst stakeholders

- Long-term (less than 5 years)
  - ICT utilization in Education – ICT in all subjects
  - Development of national ICT Standard

Need to be improved both for quantity and quality

Our action and other stakeholders’ action

- Our action
  - Presentation for Ministry of Education and stakeholders including donor agencies
  - Publish the report in text and web and send over 100 copies
  - Regional workshop “ICT education” for 12 countries 25th – 29th January 2005

- Other stakeholders’ action
  - Set up the committee to review the curriculum (but no meeting yet)

Only recommendation

- Criticism of aid in the South Pacific
  - Support only consumable (not investment?) such as education and health, a part of human capital formation, but not income generation = more dependency

- For better quality ICT literacy education
  - Strong demand of human capital with ICT literacy and support for ICT education
  - Economic benefit through information economy: “e-Fiji”
  - Full utilization of “assets” including broadband network for economic activities and education
  - Very reasonable and quality network (SCCN)
Conclusion

Broadband is not a panacea, but, in the near future, we should
- Recognition of interweaving among digital network, education, and socio-economic development
- Full utilization of broadband network to flourish e-Fiji, which invites better quality ICT education eventually

Bula vinaka and appreciate your attention