One-to-One Computing in Latin America and the Caribbean

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April 2011
Presentation content:

• The Inter-American Development Bank (IDB)

• IDB and Education

• One-to-One experiences

• A model of One-to-One implementation

• Monitoring and evaluation

• Next steps
The Inter-American Development Bank

• Founded in 1959

• Mission: to contribute to poverty alleviation and promote economic and social sustainable development

• 48 member countries; 26 LAC countries receiving support

• Technical and financial support

• Knowledge products

More information at http://www.iadb.org
IDB’ s Social Sector

• Education
• Social Protection and Health
• Science and Technology
• Gender and Diversity
The Education Division

- Flagships:
  - Early Childhood Development
  - School to Work Transition
  - Teacher Quality

- Concentration Areas:
  - ICT in Education
  - Numeracy and Literacy
  - Compensatory programs
  - Evaluation of education programs

More information at: http://www.iadb.org/edu
http://blogs.iadb.org/education
IDB Strategy

Knowledge

Operations
One-to-One Models

- Governments in the region are investing resources in the incorporation of technologies in education
- In Latin America and the Caribbean, One-to-One computing models are gaining exceptional traction
- These initiatives typically provide each child with a portable computer for educational purposes
Rationales and desired impact

- The rationales for investing in One-to-One programs fall into three categories:
  - Economic
  - Social
  - Educational
- And sometimes…
  - *Political gain*
  - *Vendor push*
Rationales and desired impact

- **Economic**
  - Increase economic competitiveness
  - Prepare students to enter a technology-saturated labor market

- **Social**
  - Reduce social and digital divides

- **Educational**
  - Facilitate new educational practices
  - Aid the development of 21st century skills
  - Offer a more personalized education
### Maximum desired impacts

<table>
<thead>
<tr>
<th></th>
<th><strong>Short term</strong> (up to 3 years)</th>
<th><strong>Medium term</strong> (3 to 6 years)</th>
<th><strong>Long term</strong> (more than 6 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Internal efficiency</strong></td>
<td>Greater student interest in learning and attendance</td>
<td>Family participation in the educational process</td>
<td>Greater school and community integration</td>
</tr>
<tr>
<td></td>
<td>Higher expectations of teachers and families</td>
<td>Better teacher-school-family communication</td>
<td>Significant increase in coverage</td>
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<tr>
<td></td>
<td>Increase in promotion and graduation</td>
<td>Development of critical thinking, strengthening of problem solving and decision making abilities</td>
<td>Decrease in overage students</td>
</tr>
<tr>
<td><strong>Skills and competencies</strong></td>
<td>Some improvement in communication, collaboration, and teamwork</td>
<td>Development of metacognition, knowledge management, personal responsibility (life, career) and social responsibility (local and global citizenship)</td>
<td></td>
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<tr>
<td></td>
<td>Better management of technology</td>
<td>Increased creativity and innovation</td>
<td></td>
</tr>
<tr>
<td><strong>Academic achievement</strong></td>
<td>Null or minor improvements in educational results (if improvements, most likely in Language)</td>
<td>Moderate improvements in some subjects</td>
<td>Significant improvements in key subjects</td>
</tr>
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One-to-One: desired impact
One-to-One Experiences
# One-to-One Programs in Latin America and the Caribbean

<table>
<thead>
<tr>
<th>Country</th>
<th>Committed</th>
<th>Country</th>
<th>Committed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>3,070,000</td>
<td>Honduras</td>
<td>57,072</td>
</tr>
<tr>
<td>Brasil</td>
<td>1,650,000</td>
<td>Jamaica</td>
<td>115</td>
</tr>
<tr>
<td>Chile</td>
<td>30,000</td>
<td>Nicaragua</td>
<td>25,000</td>
</tr>
<tr>
<td>Colombia</td>
<td>71,500</td>
<td>Paraguay</td>
<td>9,000</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>5,000</td>
<td>Perú</td>
<td>800,000</td>
</tr>
<tr>
<td>Ecuador</td>
<td>4,020</td>
<td>Trinidad &amp; Tobago</td>
<td>20,300</td>
</tr>
<tr>
<td>El Salvador</td>
<td>800,000</td>
<td>Uruguay</td>
<td>600,000</td>
</tr>
<tr>
<td>Guatemala</td>
<td>100</td>
<td>Venezuela</td>
<td>1,000,000*</td>
</tr>
<tr>
<td>Haiti</td>
<td>13,700</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Official information not available

Total: 6,847,875
Laptops distributed in LAC as of 2010

Committed, 6,847,875

Distributed 1,897,615
Laptops distributed in LAC as of 2010

Total: 1,897,615
Laptops distributed in LAC as of 2010

- Primary: 81%
- Secondary: 19%

Total: 1,897,615
Laptops distributed in LAC as of 2010

- Classmate: 1,047,500
- XO: 835,115
- Other: 15,000

Total: 1,897,615
# One-to-One Computing: Current Projects

<table>
<thead>
<tr>
<th>EVALUATIONS</th>
<th>PUBLICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peru (Experimental)</td>
<td>Short-Term Impacts of the One Laptop per Child Program in Peru: A Randomized Evaluation (July, 2010)</td>
</tr>
<tr>
<td>Paraguay (Quasi-experimental)</td>
<td>One-to-One Computing in Latin America and the Caribbean (April 2011)</td>
</tr>
<tr>
<td>Brazil (Qualitative)</td>
<td>Evaluation Toolkit for One-to-One Projects (September, 2011)</td>
</tr>
<tr>
<td>Honduras (Experimental (2011-2013))</td>
<td>Other: Uruguay: Assistance with second phase of Plan CEIBAL</td>
</tr>
</tbody>
</table>
A model of One-to-One implementation
Redefining One-to-One

“One digital device per child” has at least 3 problematic aspects:

1. Centers the discussion around the relationship between the child and their digital device, rather than how the child makes use of that device to mediate learning
2. Establishes an a priori vision around the advantage that a child has administering his/her own device, without considering options that permit a shared or collaborative use of different technologies
3. From a technological standpoint, children are acquiring greater access to a variety of personal digital devices
New One-to-One model
The “One-to-One” relationship

<table>
<thead>
<tr>
<th>1</th>
<th>:</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>digital device</td>
<td>one child</td>
<td></td>
</tr>
<tr>
<td>one child</td>
<td>learning</td>
<td></td>
</tr>
</tbody>
</table>
New One-to-One model

• The process by which the student acquires and constructs knowledge is at the center of the educational task

• Digital technologies are a part of many resources in the student’s learning process

• Technologies in education can play a disruptive role in the organization of teaching and learning processes

• The inclusion of personal digital technologies permit, facilitate, and sustain the development of the personalization process for learning
ICT in Education Framework

FINAL GOAL: STUDENT LEARNING

INPUTS
- INFRASTRUCTURE
  - Physical
  - Equipment
  - Connectivity
  - Support
- CONTENT
  - ICT Curriculum
  - Online digital resources
  - Platforms, Applications and Services
- HUMAN RESOURCES
  - Teacher training
  - ICT competences
  - Use of ICT for education
  - Pedagogical support
- MANAGEMENT
  - Administration
  - Information Dissemination
  - Community Involvement
- POLICY
  - Planning
  - Budget
  - Communication
  - Legal Framework
  - Incentives

PROCESSES & PRODUCTS
- Amenity
- ICT Layout and Tech Specs
- Implementation Process
- Help desk
- Curriculum Development
- Learning Organization
- Resources Availability
- Access and Use
- Teachers performance
- ICT Experience
- Models for educational use
- Support systems
- School Organization
- Management Systems
- Systems use
- Community attitudes and expectations
- National Plans
- Budget Allocation
- Visibility and priority
- Legal Initiatives
- Inventive programs

DEVELOPMENT STAGES
- EMERGING
- APPLYING
- INTEGRATING
- TRANSFORMING

IMPACT
- Intermediate
  - Practices
  - Pedagogical Practices
  - Students Practices
- Final
  - 1: Student Achievement
    - Test Scores
    - Curriculum Assessment
  - 2: Student Involvement
    - Enrollment
    - Promotion
    - Retention
    - Attitudes
    - Expectations
  - 3: Skills & Competences
    - Critical Thinking
    - Problem Resolution
    - Communication
    - Collaboration
    - ICT

FINAL EVALUATION

Baseline
Monitoring

IDB
Education
Cost

- To date, there is little data on the costs of One-to-One models in developing countries.

- The investment in One-to-One projects is much more than the cost of hardware and software alone. It is essential to recognize that these initiatives extend over a large period of time, and that most of the costs are reoccurring: connectivity, equipment renovation, development of digital resources, etc.
## Cost

<table>
<thead>
<tr>
<th>Initial costs (26%)</th>
<th>Reoccurring costs (61%)</th>
<th>Hidden costs (13%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware</td>
<td>Support</td>
<td>Replacement hardware</td>
</tr>
<tr>
<td>Software</td>
<td>Training</td>
<td>Damage or theft</td>
</tr>
<tr>
<td>Cabling and wiring</td>
<td>Connectivity</td>
<td>Planning costs</td>
</tr>
<tr>
<td>Deployment</td>
<td>Electricity</td>
<td>End-of-life costs</td>
</tr>
<tr>
<td></td>
<td>Subscriptions</td>
<td></td>
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<td></td>
<td>Digital educational</td>
<td></td>
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<tr>
<td></td>
<td>resources</td>
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</tbody>
</table>
Cost

• We don’t have access to all associated costs, and many of them remain invisible.

• The scale of the initiative impacts the cost per beneficiary. As the scale increases, the unit cost decreases, due to the use of the initial investment.

• It is also interesting to consider the weight of laptop investment within the total costs and necessary investment. On average for the programs we observed in the region, the investment in laptops represent 53% of the total investment.
Monitoring and evaluation

• Monitoring and evaluation play a critical role in addition to the knowledge based of the components that constitute a ‘successful’ (or ‘less successful’) project

• They can inform budgetary decisions and choices regarding the allocation of resources

• *Implementation studies* are beneficial in describing the feasibility of an initiative

• *Impact evaluations* identify the effects of an initiative in terms of its positive and negative effects, intended or not

• To date the results are not conclusive: short implementation time, little and limited evaluations, lack of appropriate instruments
Monitoring and evaluation

• The scope of different One-to-One initiatives represents a **wide range of implementation models** in terms of the ownership, connectivity, and scope

• The **attitudes and beliefs of stakeholders** (teachers, parents, children, school administrators, community members) are critical to successful implementations

• Students tend to use laptops the most for writing and Internet browsing when **connectivity** is available

• **Professional development for teachers** is an important component of One-to-One initiatives

• **Technical support** is an important factor for laptop programs to succeed
Conclusion

• One-to-One computing is a fairly recent phenomenon; it is still early to understand its economic, social, and educational impacts

• The IDB projected that by 2015, nearly 30 million students in the region will have digital devices for personal and educational use

• The evaluation of One-to-One models and their impact on learning is critical and a high priority for the IDB
Conclusion

- There is a lot that we do not know:
  - At **what stage in education** (primary, secondary, or tertiary) are One-to-One initiatives most appropriate and beneficial?
  - How will the **privacy** and **data** of each student be secured?
  - What are **the impacts on learning**, in the development of abilities that these types of initiatives can develop and with what pedagogy?
  - What distinct characteristics do students of the **21st century** have, and what should be considered the responsibility of the formal education system?
  - What will the role of **teachers** and **families** be?
Next steps

• The IDB will continue to monitor and support initiatives that strive to improve students learning and use a systemic approach in doing so

• It will also advance in its commitment to supporting the use of strong measurement tools to measure learning, especially those related to 21st century skills, which until now have been the most weak

• In its work with other international organizations, countries, NGOs, and industry partners, the IDB will continue the dialogue and creation of knowledge with respect to One-to-One models
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