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Introducing ICT to a primary school in a developing country: A Fijian experience

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Introduction

Digital technologies have created new possibilities for both teachers and students. John and Sutherland (2005) describe this as “extending and deepening classroom in ways hitherto unimagined” (p. 406). Technologies in classrooms can enable students to demonstrate their knowledge through activities such as problem solving, creativity, collaboration, and communication (Kozma, 2003). Some researchers also claim that ICT can have an impact on educational achievement, but like all tools - it depends on how it is used. While the uptake of these technologies is surely happening in developed countries - in many developing countries this transformation in the classroom is yet to occur. As the United Nations Millennium Development Goals (MDGs) for primary education comes to fruition and more children attend primary schools, a concern that has been expressed by some in developed countries is that there will be “huge gaps in the quality of education” (AusAid, 2012, para. 15). One aspect of quality education in the 21st century is the availability of digital resources in schools. Many developing countries need to build this capability – not just in terms of technology but teacher capability as well. One of the ways to achieve such capacity is through knowledge sharing between teachers and educators in developed and developing countries. Over time such collaboration can have a lasting impact on all participants on both sides of the digital divide.

This paper reports on how such collaboration can occur. It focuses on the initial stages of a long-term initiative where our primary objective is to develop models, which demonstrate how we (in developed countries) can engage productively and meaningfully with schools in developing countries to build their ICT capacity. As part of this initiative, we introduced laptops and LEGO robotics tool kits to a rural primary school in Fiji. We developed ICT activities

that aligned with the curriculum in a number of subjects. In addition, we worked with the teachers over two weeks to build their expertise.

The Context

The Human Development Index (HDI) ranks countries on the basis of a number of factors. In 2011, Fiji was ranked at 100 out of 187 countries with a HDI of 0.688 (Human Development Report, 2011). The country comprises of more than 300 islands in the Pacific Ocean with a population of approximately 900,000. Almost half of the people (52.3%) live in urban centres (Human Development Report, 2011). The variation in terms of services and career opportunities between urban and rural dwellers is significant. Public expenditure on education is 3.4% of GDP (\$4,526 – PPP\$). While more than 90% of the children attend primary schools and most teachers (97%) are qualified in their roles, 31% of the population live below the poverty line (Human Development Report, 2011). Many families cannot afford digital technologies and as a consequence, schools become the place where children can access these tools. However, local communities run almost 98% of the schools in Fiji. For some rural communities who are already facing hardship, making these technologies available to the students is very low on their priority list.

The rural school in this investigation was in a low socio-economic area with 350 students (40% indigenous Fijians, 60% Indians), 12 teachers, and 1 head-teacher. The school had children in Classes 1 to 6 (ages 6 to 12). Many were from families whose main income was derived from either farming or the hospitality industry. Unemployment was also quite high. Prior to our engagement at the school, more than 90% of the children had never used a computer.

The ICT integration strategy

There are “no universal truths” when it comes to ICT integration in Education (Hepp et al., 2004). Much of it depends on a “country’s reality, priorities and long-term budgetary prospects and commitment” (p. iv). In the Fijian context, this would depend on the school’s management committee – comprised of

members of the local community. So our approach was to liaise initially with the school management and the school head-teacher (or principal). Developing such relationships can have a significant impact on the longevity and success of an initiative (Nyika et al., 2010). Head-teachers who understand the rationale of an initiative can make a positive contribution to facilitate its success (Mitchell & Sackney, 2000).

For this initiative, we supplied the school with 10 second hand laptops (less than 4 years old), 10 new LEGO robotics kits, other peripherals (e.g. external hard drive) and accessories (e.g. digital camera and a data projector). We re-installed *Microsoft Windows XP* and drivers on each laptop. We decided to install software that were not Internet dependent (due to poor connectivity and high access costs). In addition we opted to install applications which were free downloads. The following applications were installed – *LibreOffice* (word processing, presentations, spread sheets, databases), *Microsoft Photo Story 3 for Windows* (multimedia presentations), *Audacity* (editing audio clips), *Jing* (for screen capture), *Freemind* (mind mapping), *Paint* (drawing), *Tux Suite* (typing, mathematics, drawing), *Google Sketch Up* (2 and 3D sketching). *Microsoft Windows XP* had *Windows Moviemaker* which was pre-installed.

Engaging teachers and students

While our initial focus was to develop an understanding of primary schooling and the interplay of factors which determined how innovative approaches were embraced in Fiji, we did not lose sight of the fact that we had to also demonstrate the possibilities that ICT offered to the curriculum. As a consequence we took the following approach: (a) outlined and explained the objectives of our initiatives to all staff, (b) met teachers in small groups (on the basis of their classes) to ascertain what was going to be taught (content), and (c) how they proposed to teach it (pedagogies). These conversations eventually meandered to brainstorming ideas that would enable teachers to embed technology into some of their existing classroom activities (proposed for Weeks 1 and 2 in Term 3 in the curriculum). Through such an approach we did not impose our own ideas but worked with the teachers to explore possibilities for varying their pedagogies to deliver the content with ICT. As a

consequence, robotics became a lunchtime activity. Three of the applications – *LibreOffice*, *Microsoft Windows Moviemaker*, and *Microsoft Photo Story 3 for Windows* became parts of classroom activities that aligned with the “achievement indicators” in the “Students Learning Record”. As a requirement of the Ministry of Education in Fiji, teachers keep this record on each student which lists achievement indicators, assessment methods used (summative or formative), learning outcomes, and achievement levels for each of the 10 subjects in primary school. Given the highly structured nature of their classroom programs, our approach of blending ICT with existing plans was logical. More importantly teachers were highly responsive to this strategy.

Discussion and findings

The technological tools were an “instant success” because 90% of the children had never used a laptop and 100% had never seen a programmable robot before. They found their experiences with these technologies to be interesting, enjoyable, and more importantly challenging at times.

In Class 1 and 2 the unit that the children were studying in Week 1 (of Term 3) was “A local festival” in “Social Studies”. The achievement indicator, which the teachers’ had to meet, was “1. Name a local festival. 2. Identify events that occur during the festival.” As part of this activity students drew a sketch of how they saw at their local festival. Their interpretations on the sketches varied. The size of the paper on which these sketches were done also varied. This was dependent upon what the teacher could provide. While some sketched on A4 or A3 sheets, others only had access to pages from an exercise book. We took digital images of these sketches and created a multimedia presentation using *LibreOffice*. Through this medium, the size of the paper did not matter – they were all the same size on the screen. This activity enabled all students to showcase their work. More importantly, it enabled all students to highlight what they thought was important. This process enabled students to receive feedback from their peers as they showcased their work.

The Year 3 and 4's were studying the unit "Life in an Indian rural settlement". The teachers decided to focus their attention on "Life in an Indian and Fijian rural settlement". Given that the school was in close proximity of both these settlements – this was an appropriate decision. We set them a challenge of creating a multimedia presentation using *Microsoft Windows Photo Story 3*. The students had to create a digital story on either an Indian or Fijian settlement. In groups students went out to visit a settlement and took digital images of what they thought was relevant. The images were loaded into a file on their laptops and they had to select 10 images to create their digital stories. Working in groups (3-4) students embraced this task with ease.

In Year 5 and 6 students were studying a unit in Health Science on sharing responsibility. In the achievement indicators they had to demonstrate how they could "accept assigned duties, and share responsibilities at home, school, and community". Students created and acted out the scenarios in groups which demonstrated these outcomes. These were videoed and shared with other classes. Through this exchange of videos, students were able to determine the messages that were being presented. More importantly, the videos were shot without re-takes and all had very clear messages which were aligned with the "achievement indicator".

Students in upper primary classes (5 and 6) were invited to participate in the robotics club as a lunchtime activity. Students engaged in structured 30-minute activities. These included: (a) sorting the elements in the robotics kit; (b) building a robot; (c) programming a robot, and (d) engaging in simple challenges. Student interest was high. The number of kits and the size of the classrooms determined how many students could participate in the robotics club during the lunch break.

Conclusion

Our experience in the initial stages of the project has shown that while many students had little experience with computers, the pace at which they picked up the skills to demonstrate their understanding of the achievement indicators was remarkable. It was also a shift from the traditional teaching and learning

approaches that feature predominantly in classrooms in Fiji. We were able to demonstrate to the teachers that ICT does not have to exist in isolation in schools. Through creative thinking it can be embedded in activities with ease. Such an approach varied classroom routines and as a consequence, students are enticed to engage in tasks at hand. As our experience showed, the latter can only occur if teachers design activities which are interesting, enjoyable, challenging, and connected to the real world. But for this to occur there is a need for digital resources and opportunities where the value of ICT in the curriculum can be showcased. This be delivered though partnerships between teachers and educators in developed and developing countries.

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