



COMMONWEALTH *of* LEARNING

Learning for Sustainable Development

**A BASELINE STUDY ON TECHNOLOGY-ENABLED
LEARNING IN THE COMMONWEALTH PACIFIC ISLAND
COUNTRIES: REPORT**

The Commonwealth of Learning (COL) is an intergovernmental organisation created by Commonwealth Heads of Government to promote the development and sharing of open learning and distance education knowledge, resources and technologies.



Commonwealth of Learning, 2015

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Abbreviations

ADB	Asian Development Bank
CROP	Council of Regional Organisations in the Pacific
DFAT	Department of Foreign Affairs and Trade (Australia)
ECE	Early childhood education
EEZ	Exclusive economic zone
EFTS	Equivalent full-time students
FFA	Forum Fisheries Agency
FNU	Fiji National University
ICT	Information and communication technology
ISP	Internet service provider
ITU	International Telecommunication Union
MDG	Millennium Development Goals
MEYS	Ministry of Education, Youth and Sports (Tuvalu)
mLearning	mobile learning
MoEHA	Ministry of Education, Heritage and Arts (Fiji)
OER	Open educational resources
OLPC	One Laptop per Child
PACMAS	Pacific Media Assistance Scheme
PacRICS	Pacific Rural Internet Connectivity System
PIDP	Pacific Island Development Programme
PIFS	Pacific Islands Forum Secretariat
PIRRC	Pacific ICT Regulatory Resource Centre
PITA	Pacific Islands Telecommunications Association
PNG	Papua New Guinea
PRIF	Pacific Region Infrastructure Facility
SINU	Solomon Islands National University
SMS	Short message service
SOPAC	South Pacific Applied Geoscience Commission
SPC	Secretariat of the Pacific Community
SPREP	Secretariat of the Pacific Regional Environment Programme
SPTO	South Pacific Tourism Organisation
TCC	Tonga Communications Corporation
TEL	Technology-enabled learning
TESP	Tonga Education Support Programme
TVET	Technical and vocational education and training
UNDP	United Nations Development Programme
UPNGOC	University of Papua New Guinea Open College
USP	The University of the South Pacific
USPNet	The University of the South Pacific [Satellite] Network
VSAT	Very small aperture terminal
VUSSC	Virtual University for Small States of the Commonwealth

Chapter 1

Overview of the Commonwealth Pacific Island Countries

Spanning about one-third of the earth's surface, the Pacific region consists of thousands of islands in over 40 island groups. Of these, around 30 are south of the equator and are known as the South Pacific Island nations. Nine of the South Pacific Island nations are members of the Commonwealth: Fiji, Kiribati, Nauru, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu. As Table 1 indicates, these range in land size and population from the largest, Papua New Guinea, to the smallest, Nauru.

The Pacific Islands can be divided into three sub-regions based on their people's cultural and physical attributes: Polynesia to the east, including Samoa, Tonga and Tuvalu; Melanesia in the west, including Fiji, Papua New Guinea (PNG), Solomon Islands and Vanuatu; and Micronesia in the north-west, including Kiribati and Nauru.

Table 1. Population, Land Size and Gender Ratio

Country	Population	Year	Area (km ²)	Population Density (persons/km ²)	Urban Population	Gender Ratio (male:female)
Fiji	867,000	July 2015 official est.*	18,270	47.46	52.2%**	104.2:100
Kiribati	113,000	July 2015 official est.*	811	139.33	43.9%	98.6:100
Nauru	10,084	30 Oct. 2011 census	21	480.19	100%	100:96
PNG	7,275,324	10 July 2011 census	462,840	15.71	12.6%	104:100
Samoa	187,820	7 Nov. 2011 census	2,944	63.79	20.1%	105:100
Solomon Islands	515,820	23 Nov. 2009 census	28,450	18.13	20.5%	107:100
Tonga	103,335	July 2015 official est.*	748	138.15	23.4%	100:100
Tuvalu	11,000	July 2015 official est.*	26	423.08	50.4%	not available
Vanuatu	277,506	July 2015 official est.*	12,200	22.76	24.9%	104:100

Sources:

Wikipedia. (n.d.). "List of member states of the Commonwealth of Nations by population." Retrieved from https://en.wikipedia.org/wiki/List_of_member_states_of_the_Commonwealth_of_Nations_by_population

* Secretariat of the Pacific Community. (n.d.). "Statistics for development." Retrieved from www.spc.int/sdd/index.php?option=com_docman&task=doc_download&gid=158&Itemid=42&lang=en

** Pacific Media Assistance Scheme. (2013). "Fiji." Retrieved from www.pacmas.org/about/countries/fiji

Uniqueness

Despite the challenge of vast distances and small landmasses, the Pacific region is known for the unique "Pacific way" that characterises how the island nations work together, entering into dialogue to resolve issues. The region's relatively peaceful coexistence has endured over the years, although within some countries there have been conflicts and unrest. This collaboration between nations underpins the strong relations evident in the regional organisations that have stood the test of time, epitomising the regional cooperation of these island countries. These regional organisations include the Secretariat of the Pacific Community (SPC), the Pacific Islands Forum Secretariat (PIFS), the Secretariat of the Pacific Regional Environment Programme (SPREP), the South Pacific Applied Geoscience Commission (SOPAC), the Forum Fisheries Agency (FFA), the Pacific Island Development Programme (PIDP), the South Pacific Tourism Organisation (SPTO), the Pacific Islands Telecommunications Association (PITA) and The University of the South Pacific (USP). Others have been formed in recent years in response to regional needs – for example, the Pacific Media Assistance Scheme (PACMAS), the Pacific Region Infrastructure Facility (PRIF) and the Pacific ICT Regulatory Resource Centre (PIRRC).

Table 2. Pacific Commonwealth island nations' membership in regional organisations

Organisation	FFA	PACMAS	PIDP	PIFS	PIRRC	PITA	PRIF	SOPAC	SPC	SPREP	SPTO	USP
Number of Nations	17	14	20	16	14	14	13	18 + 3 associates	22 island nations + 4	21	18	12
Main Focus	Sustainable management of fishery resources	Media capacity building	Professional services, research	Programmes and activities supporting and implementing leaders' decisions	Pacific ICT regulatory resources	Telecommunications	Co-ordinated development and partner assistance	Geoscience: oceans and islands	Technical and developmental organisation	Environment	Tourism, travel	Education, training
Fiji	√	√	√	√	√	√	√	√	√	√	√	√
Kiribati	√	√	√	√	√	√	√	√	√	√	√	√
Nauru	√	√	√	√	√	√	√	√	√	√	√	√
PNG	√	√	√	√	√	√	√	√	√	√	√	
Samoa	√	√	√	√	√	√	√	√	√	√	√	√
Solomon Islands	√	√	√	√	√	√	√	√	√	√	√	√
Tonga	√	√	√	√	√	√	√	√	√	√	√	√
Tuvalu	√	√	√	√	√	√	√	√	√	√	√	√
Vanuatu	√	√	√	√	√	√	√	√	√	√	√	√

Sources:

https://www.ffa.int/regional_organisations

<http://spto.org/about>

<http://www.spc.int/en/about-spc/history.html>

<http://iwlearn.net/connfo/contacts/mxmcontactsorganization.2006-07-20.4979302736>

<http://gsd.spc.int/crop>

<http://www.theprif.org/index.php/about-prif-full/faqs>

https://www.google.ws/?gws_rd=cr,ssl&ei=i7CYVca3LsbJmAWu7YiQBA#q=PIDP

https://www.google.ws/?gws_rd=cr,ssl&ei=OpWYVfnqKcivmAW12YOIAQ#q=PIRRC

The organisations have been grouped under the Council of the Regional Organisations of the Pacific (CROP). Two of the CROP working groups – Human Resources Development and Information Communication Technologies (ICT) – are led by USP. These deal with the focus areas of this report, where the ICT working group works on ICT infrastructure and related matters whilst the Human Resources Development working group works on capacity building (i.e., education and training).

The decisions of the regional organisations are reached by consensus (“the Pacific Way”). This is the key to the collective strength of the islands, small as they are as individual countries.

The region is also well known for its attractive tourist sites, coupled with pleasant year-round temperatures that have made one nation smartly promote their country as “heaven on earth” and another as “paradise.” Tourism therefore is a significant part of the economies of many of these nations, although most rely on agriculture, some on their ownership of a substantial expanse of ocean and thereby large economic exclusive zones (EEZ), whilst a few with minimal land masses have developed human resources who send remittances from overseas.

ICT in the South Pacific

Technologies that enable learning must combine with the telecommunication infrastructure to be of use as communication tools for education. Thus, the basic telecommunication infrastructure must be sufficiently advanced before communication technologies can be effective. This has dictated the penetration rate in the South Pacific region, which has been slow compared to rates in other parts of the world.

As Appendix 3 indicates, ICT data compiled by the International Telecommunication Union (ITU) and presented in the Framework for Action on ICT Development in the Pacific (FAIDP) 2010¹ review report shows there is still wide disparity in penetration rate amongst the nine South Pacific Island Commonwealth countries. Fiji, Tonga, Vanuatu and Papua New Guinea have developed fairly rapidly, whilst others have yet to experience the full range of technologies. Whilst mobile telephone use has grown at a phenomenal rate in most of the nine nations, Internet access is still low. The highest growth rate is of the mobile telephone, particularly the prepaid version, whilst the slowest has been Internet access and use. The common issue shared by all the countries is the related cost, particularly of long distance calls and Internet access. However, in recent years, governments have moved to acquire infrastructure to provide cheaper connectivity, and most countries have been developing policies to regulate communication technologies and ensure easier access and increased affordability.

In the continuous search for solutions, the CROP ICT Working Group developed the FAIDP formulated in 2010 (Manoa, 2015). In 2013, a call for a midterm review of the FAIDP 2010 resulted in several recommendations for further action and gave rise to the 2014 draft Pacific Regional ICT Strategic Action Plan (PRISAP), which focuses on “ICT indicators such as universal access, e-Government, cybersecurity, leadership, disaster management, governance, coordination and partnerships, ICT policy and legislation and human capacity and development” (CROP ICT Working Group, 2014). Appendix 4 provides data from the FAIDP 2010 review report on the status of ICT and capacity building.

In terms of infrastructure, the demand for lower cost but high Internet speeds has led South Pacific nations to seek ways to access the fibre-optic cable option, considered to be the best technology for quality access. Countries such as Fiji, Vanuatu and Tonga have taken the lead in improving their telecommunications infrastructure with fibre-optic submarine cables. Samoa is poised to improve connectivity when it connects through Fiji and onto the Southern Cross submarine fibre-optic cable, as outlined in a recent public announcement of the approval of a World Bank International Development Association (IDA) grant for the Samoa Connectivity project (“Minister welcomes Internet project,” 2015). Other funding sources for the Samoa project are the Asian Development Bank, the Samoa Submarine Cable Company and the Australian Department of Foreign Affairs and Trade (DFAT).

¹ The Framework for Action on ICT Development in the Pacific was set up in 2010 in response to a call by Pacific leaders, in August 2009, who recognised the importance of ICTs in economic development as well as other fields.

Significantly, the funding assistance is provided as grants, and the total cost is USD 126.28 million. Other South Pacific countries that face difficulties in using fibre-optic cables are developing satellite infrastructures – for example, Tuvalu, Solomon Islands and Kiribati. Tuvalu has signed agreements with offshore communications companies from Singapore (Kacific) and the USA (ABS) (ABS, 2015; Kacific, 2013, 2014; “Kacific inks,” 2014; “Kacific to provide,” 2014). In 2014, O3b Networks global satellite services entered the Pacific region, offering a system for more island nations that “combines the global reach of satellite with the speed of fiber” (O3b Networks, 2015).

Importantly, some island nations have developed national policies to regulate the costs and use of ICTs and prohibit monopolies (Appendix 5). These have helped to reduce the costs for the average user. As well, the availability of inexpensive telephones with a variety of applications has helped the individual user to access communication more affordably than ever before. Some educational institutions, including USP, have explored such developments further for their use in learning support.

Regional Trends in ICT in Education

At the turn of the century, the Pacific Island Regional Association for Distance Education (PIRADE) publication *Appropriate Telecommunication and Learning Technology for Distance Education in the South Pacific* (Vaa, 2000) informed about the status of technology that assisted in the delivery to and learning of students at a distance. Radio broadcast was found to be most commonly used at the school level. It was also the most affordable, given the numbers the programmes reached. At that time, television was not widely available, and the production costs of programmes were prohibitive. The Internet was available in some countries but not in others. For higher education, distance learning students received study materials in print, as these were affordable to produce and distribute. As a communication technology, telephony is an essential tool for distance education, but at the time of the PIRADE study, fixed telephony was concentrated in urban areas whilst mobile telephony had only just entered the region. Using the Internet and email for learning was not common due to related costs for students – for example, accessing/owning computers and having Internet connectivity.

The PIRADE study was followed by the 2003 UNESCO Meta Survey on the use of technologies in Education (Farrell & Wachholz, 2003). This survey reported that significant improvements had been achieved, but there were still many instances where progress was slow, mainly due to the lack of basic infrastructure to allow affordable access. Again, there was considerable diversity in the extent of ICT penetration. There were also initiatives that have not continued, such as Solomon Islands Distance Education Network and People First Network in the Solomon Islands, although they held much promise for development, particularly in the rural areas.

In setting up the FAIDP 2010, the Pacific leaders ensured that a mechanism was in place to assist nations with difficulties to catch up with the developed countries. The review of the FAIDP 2010 has updated the information on ICT infrastructure as well as ICT used for education in the region (see Appendix 4). It has shown that ICT usage in education has increased in almost all of the nine countries, thanks to the foresight of decision makers who ensured continuous improvement of infrastructure and the necessary communication tools. Indeed, some countries, such as Fiji, Tonga and Vanuatu, have forged ahead in their development initiatives and are now connected through the submarine fibre-optic cable, whilst Tuvalu, Kiribati and Solomon Islands have sourced Kacific, O3b and other satellite networks. As improvements in the necessary infrastructure continue, educational and training institutions are taking advantage of the new communication and learning technology to support and improve teaching and learning efforts. However, there remains the issue of cost, particularly of Internet access. Innovative delivery methods such as the SchoolNet and the One Laptop per Child (OLPC) projects have been increasing access and improving learning for the disadvantaged. In recognising the value of ICTs for education, and the key role of education in the development of a nation, the South Pacific island nations have worked hard to ensure that the ongoing issue of cost (particularly of Internet access) will decrease. This has led to the development of national ICT policies that regulate the industry and ensure prices are set at affordable levels. The approach has been effective, as seen in the reduction of prices when monopolies of providers were removed after national policies took effect.

In 1995, the availability of Internet access in Fiji led to the need to develop policy on the Internet, and with many regional agencies being based in Fiji, the policies developed have been for both national and regional contexts in the country. Hassall (2006) has outlined regional e-policy commitments and highlighted the CROP groups – the Pacific Islands Forum, United Nations agencies, and the USP – that worked on this. Further to the CROPS work, the United Nations Development Programme (UNDP) and the United Nations Office for Project Services have also worked to facilitate the development of national ICT strategy plans for Fiji and other Pacific Island nations through the “e-Pacifika Project.”

Higher education institutions have also played a significant role in promoting ICT capacity to support education in the region. In Fiji, the three universities – USP, Fiji National University (FNU) and the University of Fiji – all teach programmes that use ICT and build ICT capacity. USP extends this to 11 other South Pacific Island nations. Similar study programmes are offered by other universities in the region, such as the National University of Samoa (NUS), Solomon Islands National University (SINU), the University of Papua New Guinea (UPNG), the University of Technology (UniTech) and Pacific Adventist University (PAU) in Papua New Guinea, as well as technical colleges – Asia Pacific Technical College (APTC) in Fiji, Samoa and Vanuatu, the Vanuatu Institute of Technology (VIT) and the Tonga Institute of Higher Education (TIHE). Some (for example, USP, NUS, VIT and TIHE) also teach media and journalism programmes.

The University of the South Pacific

The University of the South Pacific is a regional university serving 12 member countries: Cook Islands, Fiji Islands, Kiribati, Marshall Islands, Nauru, Niue, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu and Vanuatu.

USP has played a significant role in promoting ICT capacity in the region. One of its achievements in recent years is the building of a state-of-the-art ICT facility on its Suva campus through assistance from the Japanese government. The university has also succeeded in negotiating Internet connection with the Australian universities’ Academic and Research Network. Furthermore, USP takes the lead in the smaller island nations, where it is often the sole tertiary education provider offering online courses. Currently, USP is in a strong position regarding ICT for education throughout its 12 member countries, leading the way in the use of ICT for learning. For instance, USP has trialled innovative mLearning initiatives using SMS, tablets and iPads to support students’ learning. These are supplementary to the USPNet satellite system, which connects all 14 USP campuses and allows students to study from their countries through distance and flexible learning study modes. The USPNet upgrade in 2010 to the Remote Education and Conferencing Tool (REACT)² further enhanced connections, allowing interactive and synchronous audio and visual conferencing. Other USP initiatives include providing wireless connectivity for students in addition to the access provided by USPNet; this helps when there are insufficient PCs to support the enrolled numbers. Through USPNet, students have unlimited Internet access to use the university’s Moodle platform to interact with lecturers, tutors and students at other campuses, and to access library databases and email. In Samoa, an upgrade of over 60 in-service science teachers from diploma to degree is making use of tablets onto which learning materials have been loaded to support students who are enrolled in online courses. Other programmes, such as, Foundation Studies, have started to use SMS to contact students in further support of their learning.

The One Laptop per Child project³

This global project aimed to provide educational opportunities for underprivileged children through a low-cost (USD 100) “laptop” that aims to “create educational opportunities for the world’s poorest children by providing each and every one with a rugged, low-cost, low-powered, connected laptop,

² <http://www.usp.ac.fj/index.php?id=12218>

³ <http://www.webmedia-staging.com/ntlheritage/wp-content/uploads/2012/01/OLPC-DATA-2012.pdf>,
<http://www.olpcoceania.org>

loaded with open source content and software designed to foster collaborative, self-empowered learning.”

According to the OLPC wiki, “OLPC is designed around five core principles – Child Ownership, Low Ages, Saturation, Connection, and Free and Open Source tools.”⁴

The OLPC initiative

- “is an education project, not a computer or technology project”;
- “is about better learning opportunities for children, about unlocking their creative and intellectual capacity”;
- will develop “a new generation of software aimed specifically at children aged 6 to 12 years who have no or limited access to education that live in communities of extreme poverty, often in the most remote, rural locations”;
- and thus, it is envisaged that this will result in “improved educational outcomes for communities and developing nations” (Government of Fiji, 2012a).

OLPC linked with the objectives of the Pacific Regional Digital Strategy and of the United Nations Convention on Diversity of Cultural Expressions. To date, of the nine Commonwealth nations in this current study, Fiji, Kiribati, Nauru, Papua New Guinea, Samoa, Solomon Islands and Vanuatu have developed OLPC projects.⁵ The global project aimed to include many others – and in 2008, the targets for Oceania were: five per cent by 2009; 30 per cent by 2010; 75 per cent by 2012; and 100 per cent by 2015.⁶ However, currently, only Fiji is continuing with this project, having expanded from three original pilot schools to 75. Kiribati is also operating some laptops but in the national library rather than in schools, as had been the original setup and intention. The production of the specially developed laptop has reportedly ceased, and distribution offices have closed down. Some active work continues, but not at the level of 2010–2011.⁷ In one country, the demise of the project has been attributed to a lack of teacher training, preventing the machines from being used as they were intended.

The latest technology on the education scene is the tablet, which heralds a possible way forward following the demise of the OLPC initiative. In Samoa, over 60 upgrading science teachers have been issued with tablets, which are enabling them to continue studying at a distance during school terms. In Fiji, a recent donation by India of 5,000 tablets also offers a way forward beyond OLPC.

Another positive impact of the ICT revolution has been in “helping to reduce poverty rates in the Pacific, particularly with the use of mobile phones to help remote countries in the region connect with the world” (Casabona, 2013). Liza Casabona has suggested that high-speed Internet connections will accelerate social and economic development, which will address the growing problem of poverty in the Pacific region, compounded by its remote geography. In Vanuatu, for example, a 70 per cent increase in mobile phone connections means that eight out of 10 people now have a mobile phone connection, thus allowing for speedy communications. Before, a phone call could take hours, given the distance one travelled in order to reach a telephone. ICT are thus being hailed as tremendously important in many spheres besides education.

Examples of good practices in the use of ICT for learning include: the Samoa SchoolNet project, in which all but two secondary schools are participating (funded by ADB) and in which teachers are being trained at the same time; the OLPC project in Fiji, in which 75 primary schools are participating; and three pilot projects in Tuvalu primary schools, which are all taking part in ICT-enabled learning initiatives that have been well planned and are being well implemented. New initiatives are also planned in Samoa to extend SchoolNet to primary schools; in Vanuatu, 25 pilot learning centres are being developed, and in Kiribati, a rural-based project will soon commence trials. The COL Classroom

⁴ http://wiki.laptop.org/go/The_OLPC_Wiki

⁵ http://wiki.laptop.org/go/OLPC_Oceania

⁶ http://wiki.laptop.org/images/c/c4/OLCP_Oceania_--_Concept_Note_--_Sep08.pdf

⁷ Personal communication with I. Thomson, September 2015.

Without Walls initiative, requiring equipment that costs only USD 100 and using open source software such as Moodle, Drupal, WordPress and ownCloud, also seems to be of value to the region.

However, Ian Thomson,⁸ manager of USP's Teacher Educational Resource and E-Learning Centre, has sounded a word of caution, having worked with eight Pacific ministries of education. Learners must "be prepared well to use these innovations . . . as these use content and resources new to the Pacific." He observes the need "to address the gap in ICT capacity in education systems; understand enabling change through ICTs; explore regional initiatives that can help, and to scale up resources to scale up and sustain efforts."

The following chapter describes ICT developments and TEL in each of the nine Commonwealth Countries in the South Pacific region.

⁸ From Thomson (2015) and personal email communications with Ian Thomson in July 2015.

Chapter 2

TEL in the Commonwealth Pacific Islands: Country Reports

Fiji

Fiji comprises over 300 islands and islets, around 100 of which are inhabited, with a total land area of 18,270 km². Most of the country is volcanic in origin, whilst the smaller islands are coral and limestone. The majority of the country is mountainous, with several peaks exceeding 1,000 m. Barrier reefs ring most islands. The two largest islands, Vanua Levu in the north and Viti Levu in the south, make up over 80 per cent of Fiji's total landmass. The Republic of Fiji gained independence in 1970 after nearly a century of British control.

As one of the most developed economies in the Pacific island realm, Fiji relies heavily on its tourism industry and sugar exports. The island nation is also rich in gold, coconut oil, seafood and lumber.⁹

The population at the 2007 census was 837,271, and the 2015 estimate is 867,013; the gender ratio is 104 males to 100 females.¹⁰ Population density averages 46.74 km². However, nearly 90,000 Fijians are in the capital, Suva, whilst the Suva metropolitan area has around 180,000. The population is of mixed ethnicity: Fijian 57.3 per cent (predominantly Melanesian, with a Polynesian mixture), Indian 37.6 per cent, Rotuman 1.2 per cent, other 3.9 per cent (European, other Pacific Islanders and Chinese). The official language is English, but Hindi and Fijian are commonly spoken, given the large numbers of both groups. Other languages are also used, including Rotuman, Chinese and other Pacific island languages.

National ICT and Internet Access

ICT in Fiji has grown in leaps and bounds, as outlined in Chapter 1, making Fiji the most developed of the Pacific Commonwealth countries in this regard. This is clearly evident in the penetration rates shown in Appendix 3. With connectivity much improved through the submarine Southern Cross cable link in 2000, Fiji has been a leader in providing enhanced Internet access for its population. It has also enjoyed mobile telephony for many years. As well, having started to develop policies from the mid-1990s and as the host to several regional agencies, Fiji has ICT policies that reflect the national and regional mix driving the development of these regulations. Since 2000, more ICT policy development has occurred. According to Hassall (2006), at that point, the ITC Department (within the Ministry of Communications) commissioned the "e-Government Strategic Plan," which proposed a ten-year development plan to lay the foundation for ICT policies, procedures and infrastructure, including all government policies, a disaster recovery plan and facility, service-level agreements, a strategic review process, a fibre-optic network for government departments, intranet, links to regions, and competitive international linkage. In 2003, the ICT Council issued a draft "Fiji Information and Communications Technology Policy," and the ITC Department's website began to include substantial content.

The Fiji Government's IT Policy¹¹

The national government's *Information Technology Policies and Principles* document is intended "to develop and recommend policies and principles for Information Technology (IT) particularly in the areas of:

- Preferred software and hardware platforms;
- Strategic data management; and
- Strategic communications management.

⁹ <http://www.worldatlas.com/webimage/countrys/oceania/fiji/fjfacts.htm#page>

¹⁰ <http://www.stasfiji.gov.fj/index.php2007-census-of-population>;

http://www.spc.int/sdd/index.php/en/downloads/cat_view/28-pacific-data/104-populations-a-demographic-indicators_FJ

¹¹ http://www.itc.gov.fj/images/stories/policies/Fiji_Govt_IT_Policy.pdf

It is envisaged that the departments of the organisation would then apply these policies and principles in planning and installing their own applications solutions. In particular, they can be utilised in the planning of the rationalisation of future government systems” (Government of Fiji, n.d.[b]).

Education

Education remains critical in the development of the rural areas, and upgrading rural schools and facilities is a priority.¹²

Fiji’s education vision is “quality education for change, peace and progress,” and its mission is “to provide a holistic, inclusive, responsive and empowering education system that enables all children to realize their full potential, appreciate fully their inheritance, take pride in their national and cultural identity and contribute fully to sustainable national development.”¹³

The Ministry of Education, Heritage and Arts (MoEHA) is responsible for education in Fiji, along with the Higher Education Commission (HEC) and the Technical and Vocational Education and Training Commission. The country has almost 1,000 schools, of which almost 750 are primary and 150 are secondary. Ten years of compulsory education starts at the age of six. Primary school comprises six years and secondary seven. Some 96.5 per cent of pupils completed primary school in 2011.

Regarding TEL, the HEC is responsible to “develop or cause to be developed an academic broadband facility for use by higher education institutions” (Government of Fiji, 2013).¹⁴

ICT in Education Policies, Strategies and Programmes

MoEHA follows the 2015–2018 Education Sector Strategic Development Plan, which has been designed to further enhance the ministry’s reputation for education excellence (Government of Fiji, n.d.[a]). The plan has 12 guiding principles that define the focus upon enhanced outcomes: access, accountability, customer service, equity, inclusiveness, innovation, professionalism, quality, relevance, responsiveness, stakeholder partnership, student-centeredness.

Amongst the strategic priority areas in the plan are nine overall outcomes, one of which is “technology and employment”: “Students acquire technological entrepreneurial, adaptability and employability, skills through creativity, innovation, quality, learning and competent vocational training that enhance sustainable development” (Government of Fiji, n.d.[a], p. 13). One of the strategies employed is to improve access to quality ICT education programmes. The plan highlights the government’s key performance indicators in this regard:

- Strengthen distance and eLearning
- Increase support for the design, development and delivery of eLearning
- Increase the number of educational electronic learning devices for teachers and students, to enhance the learning and teaching process
- Improve resources to support ICT education
- Enhanced eLibrary resources to support learning and teaching
- Harness education through technology and social media

There are three universities operating in Fiji:

- The University of the South Pacific (USP) was founded in 1968 and is co-owned by Fiji and 11 other countries. USP has two other campuses in Fiji, at Labasa (north) and Lautoka (west).¹⁵

¹² See the education newsletters of the Ministry of Education, Heritage and Arts, at <http://www.education.gov.fj/index.php/news-hub/latest-news>.

¹³ *Fiji Education Gazette Term 1, 2013*, at

<http://www.education.gov.fj/images/Gazette/TERM%20ONE%20GAZETTE%202013.pdf>

¹⁴ See also www.fijieducators.fhec.org.fj.

- Fiji National University (FNU), established in 2010, was formed by the merger of seven tertiary institutions: College of Advanced Education; College of Agriculture Institute of Technology, Suva; Lautoka Teachers College; School of Medicine; School of Nursing; and the Training and Productivity Authority. FNU has a large investment in computing resources and has encouraged the university community to use these resources effectively to share information and knowledge in support of the university's mission of education, research and public service, as well as to aid in the institution's administration. The institution has developed extensive policies on the use of ICT facilities.¹⁶
- The privately owned University of Fiji (UoF) is based in Lautoka, on the western side of Viti Levu. UoF also has institutional policies on the use of ICTs.¹⁷

MoEHA Policies

A new Fiji Education Management Information System has been developed to replace the old School Information Management System, with the expectation that this will result in the collection of reliable data from schools and provide statistics to assist in planning and decision making.¹⁸

In 2011, the government launched three initiatives to “develop the Information Communication Technology (ICT) sector in Fiji and to strengthen [the country's] position as the ICT regional hub” (Government of Fiji, 2011):

- Fiji's first National Broadband Policy
- Fiji's Spectrum Plan for FM radio and television
- Three telecentres established by the Ministry of Communications at schools in Suva, Levuka and Rakiraki

The National Broadband Policy

Developed through collaboration between the Ministry of Communications, the local telecommunications sector and the International Telecommunications Union, and via a process that included public community consultations, the policy:

- is a five-year plan and includes milestones that must be achieved to ensure the development of broadband and the ICT sector;
- includes short- to medium-term goals, stakeholder roles and responsibilities, and the national broadband action plan for 2011 to 2016.

The vision is that “availability of high quality, affordable broadband services in Fiji will promote innovation and economic growth and development. Broadband increases communication efficiencies, expands access to telecommunications and drives the development of new products, services and applications. Benefits of broadband also extend to other key sectors of the economy such as education, health, agriculture, commerce, tourism and the service industry” (Government of Fiji, 2011). This policy will be regularly reviewed, at least annually, in that period, and, if necessary, modified.

Major Initiatives

In addition to the initiatives at the three universities, the MoEHA is implementing projects that are in line with the vision of Fiji being the knowledge hub of the Pacific.

One Laptop per Child Programme

In 2012, approval was given for the Ministry of Education's OLPC programme. This initiative is in line with the 2007 decision by the Pacific Island countries' ministers of education to implement the OLPC and pilot programmes that were initiated in six other Commonwealth island countries: Kiribati, PNG, Nauru, Samoa, Solomon Islands, and Vanuatu. The project aimed to bridge the digital divide at the

¹⁵ See www.usp.ac.fj.

¹⁶ <http://ict.fnu.ac.fj/policy.html>

¹⁷ <http://www.unifiji.ac.fj/information-and-communications-technology-ict-policy/>

¹⁸ <http://www.education.gov.fj/index/php/g/dsaf>

primary school level, as it involved children aged six to eight. In the regional initiative, 800 laptops were donated by Bank South Pacific.

The first phase of the project was in PNG, with three subsequent demonstration schools in the Suva area: the Draiba, Nabua Sanatan and Navesi primary schools, which commenced the project in October 2013. In 2012, according to the then Minister of Education Mr. Filipe Bole, from these first three schools, the Fiji programme would expand to 30 schools so that by the end of 2013, “all primary schools [would be] in the One Laptop Per Child programme. After that we will move to secondary schools. This is part of Government’s efforts to reform education for all students. The Government wants to keep students at school so that they can complete their education” (One Laptop per Child, 2012). The minister also said that the project intends to promote a cultural and educational network, bringing officials from the culture, education, media and ICT sectors together to foster the inclusion of culture in education. He noted that the project complements and enhances other ICT in education initiatives and will help develop 21st-century computer and IT skills in Fijian students, which will greatly contribute to making Fiji a knowledge-based society.¹⁹ To date, according to Thomson (2015), there are now 75 Fiji schools in the OLPC programme, mostly in rural areas, with over 100 teachers trained, and nearly all secondary schools have a computer lab, provide Internet access and teach IT as a subject.

Telecentres

Established by the Ministry of Communications at schools in Suva, Levuka and Rakiraki, telecentres aim to increase the accessibility of basic ICT services at no cost to students and their communities. Similar centres, known as Community Learning and Information Centres (CLIC), have also been set up in Fiji’s provincial communities in partnership with USP. Their major goal is “to promote lifelong education and encourage youths and adults to read and to learn from educational videos loaded into the computers on various topics, and work with communities who are keen and interested” (USP, 2014).

National Policy on Open Educational Resources

In a recent development (May 2015), Fiji’s draft national policy on open educational resources (OER) was endorsed by a stakeholder consultation group. This document is intended to “provide direction in the use of OER to support quality teaching and learning in Fiji’s education and training system.” Planned to take effect in January 2016, the policy will apply to “all public and private early childhood education centres (ECEs), primary, secondary and post-secondary educational and training institutions including universities and to all other non-government and training institutions operating in Fiji.”²⁰ At the time of writing, according to Fiji MoEHA/FHEC officials working on the OER project, “the OER repository setup is part of the immediate implementation plan,” and “one of our outcomes is to license ten per cent of publicly funded textbooks in the K–12 system by the end of next year. These will be [added to] the repository and made available to our public and to the world. In return it will empower writers and the Fiji curriculum as one made available for public viewing and scrutiny.”²¹

Prospects and Challenges for TEL

Prospects

- Reliable and efficient services arising from new developments in infrastructure
- A selection of affordable services that will benefit consumers
- Equitable universal access to telecommunication services and the Internet
- Increased capacity building and skill enhancement in the MoEHA plans
- All primary schools participating in the OLPC programme
- All secondary schools having self-developed webpages and computer labs

¹⁹ See www.fiji.itc.com; http://www.webmedia-staging.com/ntlheritage/?page_id=158; blog.laptop.org/tag/fiji.

²⁰ www.fijieducators.fhec.org.fj/moodle/pluginfile.php/16/mod_forum/attachment/1/OER%20Policyv4.docx

²¹ Personal communication by email with FHEC officials, September 2015.

- Use of OER for teacher support, leading to wide range of subject areas with readily available, quality teaching resources
- Ongoing and strengthened relationships with donor partners that understand the challenges the country faces

Challenges

- Cost and availability of remote power supplies to rural areas
- Cost of computer hardware and accessories for individual users
- Skill availability and competency levels of teachers and trainers in the immediate future
- Security, spam and cybercrime issues

Kiribati

Introduction

The widely scattered islands of Kiribati straddle the equator and include the Gilbert, Phoenix and Line island groups. Most are uninhabited. These low-lying coral atolls (33 in all) are the protruding tips of undersea volcanoes and extend only a few feet above sea level. The total land area is 849 km², and the highest point is 81 m). Although the vast area covered by the islands poses extreme challenges – for example, in terms of transport and communications – it has given the country a substantial EEZ. Kiribati's isolated location makes it difficult to develop tourism as a major business, although Kiritimati (Christmas) Island, with its close proximity to Hawaii, is a growing tourism destination for game fishermen and bird watchers. The weather is consistently warm, offshore reefs teem with colourful fish, and WWII shipwrecks are commonplace, especially off the eastern edge of Kiritimati, the world's largest coral atoll and once used for nuclear weapons testing.

The local economy depends on fish and other marine resources, copra and subsistence farming, and remittances from its seafarers.

The population at the last census (2010) was 103,058.²² The estimate for 2015 is 113,438, and the gender ratio is 1:1.²³ The official languages are Taetae ni Kiribati (also known as Gilbertese) and English. The capital is South Tarawa.

National ICT, Internet Access and ICT Policies

The government is committed to an Outer Islands Strategy under a universal access regime for the outer islands to ensure ICT services are available, to the greatest extent feasible, to all of the people of Kiribati. The government is determined that people living outside the main centres should also share in the transformational opportunities which ICT can deliver. In a long-term plan, the government will co-ordinate the development of the telecommunications infrastructure with the development of other infrastructures, such as electricity and roads, to provide the basis for developments that will facilitate and transform essential communication services to all I-Kiribati.

“In March 2011 the Government of Kiribati approved its National ICT Policy. The policy recognises that to further economic growth, increased availability of affordable and reliable ICT services is a key requirement, particularly for remote areas of the Republic where there is unreliable or no service. Five key principles that will support the development of greatly improved communication services for Kiribati have been identified in the policy: an open and competitive market for communication services; modern, independent and proportional regulation; non-discriminatory and technology neutral licensing; universal, modern and reliable services for the remote parts of the Republic; efficiency and reduced capital costs for service providers that own networks by providing a framework. The latter will be overseen by the Communications Commission, for the sharing of the physical infrastructure” (Family Online Safety Unit, 2014).

National ICT Policy: Phase 1 Reforms, 2 March 2011²⁴

The policy focuses specifically on telecommunications networks and services, which are the essential building blocks of the broader ICT sector. Telecommunications services help to overcome the barriers of long distance and isolation, which are particularly challenging for Kiribati. Government ministries and island councils can benefit considerably from affordable and reliable telecommunications, which will assist them in providing services to their constituents.

²² <http://www.mfed.gov.ki/statistics/kiribati-document-library>

²³ http://www.spc.int/sdd/index.php/en/downloads/cat_view/28-pacific-data/104-populations-a-demographic-indicators_KI

²⁴ <http://www.mfed.gov.ki/sites/default/files/Kiribati-ICT-Policy-Mar-2-2011.pdf>

Unfortunately, the current lack of telecommunications services for the outer islands means that many families are unable to stay in contact with loved ones who have travelled to other parts of Kiribati or internationally, often in search of work.

In 2012, “The Republic of Kiribati was one of the least ‘connected’ countries in the world. Most of the population either has no access to information and communication technologies (ICT) or, are unable to afford the service. Mobile phone penetration was 14 per cent as of end-2011, and broadband Internet penetration less than 0.5 percent of the population” (World Atlas, 2015b).

In 2013, the Kiribati Parliament passed the Communications Act, which established the Communications Commission of Kiribati (CCK). Amongst other things, the Commission’s role is to strengthen the legal, regulatory and institutional environment to stimulate investment in communications, thereby enabling the transition to a market-driven telecommunications sector.

Policy Documents on ICT: Communications Act 2012²⁵

Effective May 2013, the Act stipulates that the telecommunications authority is the CCK. This group of five members (chairman and four others) holds the power to issue licences, regulate access to and sharing of communication facilities, monitor and enforce compliance, and regulate the protection of customers, amongst many others functions. It is able to “make rules to regulate its own procedure.”

Current Status of Telecommunications in Kiribati

As Appendix 3 reveals, the ICT sector in Kiribati is underdeveloped. Compared to other Pacific Island countries, Kiribati has a relatively low level of penetration for all fixed telephony, mobile and Internet services. However, the government has recognised that in other similar markets, including other Pacific Island countries, mobile penetration has risen rapidly following the commencement of a second mobile operator. The affordability of these basic services is also a major issue: Kiribati’s fixed and mobile telephony services are amongst the least affordable in the Pacific. The mobile revolution is still to take place in Kiribati.

However, according to a World Bank report, all this is about to change due to the implementation of the Kiribati Telecommunications and ICT Development Project P126324.²⁶ This is a significant move with the help of a World Bank International Development Assistance Grant, supplemented by an Australian and New Zealand grant disbursed through the Pacific Region Infrastructure Facility (PRIF). The objective is “to strengthen the legal, regulatory and institutional environment, enabling transition to a market-driven telecommunications sector and facilitating improved connectivity for the Outer Islands.” With its four components of “ICT Policy and Legal Support,” “ICT Regulatory Support,” “Outer Islands Connectivity Support” and “Project Management Support,” this has been dubbed by some “the project of a lifetime.” The project’s timeframe is November 2012 to June 2017; as of August 2015, progress towards achievement is “satisfactory.”

In addition, recent developments in infrastructure plans (the Kacific satellite system) have brought the anticipation that changes will occur to increase IT access for educational purposes. Indeed, since 2012, some significant changes have occurred, as described in the following excerpts:²⁷

- “the first two components of the Telecommunications and ICT Development Project led to enactment of a comprehensive 52pp and 125 clauses Communications Act 2013 which ‘implements the Government of Kiribati policy for the reform of the ICT sector adopted in April 2011. The central objective of that policy is to achieve open and competitive communications markets in Kiribati’ through competition which will result in the delivery of significant social and economic benefits through improved services, lower prices and broader coverage. According to the Explanatory Memorandum to the Act, the Act ‘sets up a framework for regulation of communications. The framework is intended [to] provide a

²⁵ <http://www.cck.ki/index.php/downloads/finish/23-publication/48-communications-act-2012.html>

²⁶ <http://www.worldbank.org/curated/en/2015/01/23892660/kiribati>

²⁷ Personal communication from Dr. Uentabo Mackenzie, Director, USP Kiribati Campus (June–July 2015).

modern, independent, non-discriminatory and proportionate regulation of communications in Kiribati. The [Act] has been developed having regard to international best practice and the particular needs of Kiribati.”

- “Recent developments following [the] enactment of this Act [include]:
 1. Establishment of the Communications Commission of Kiribati (CCK) as the regulatory authority with more powers than its predecessor, Telecommunications Authority of Kiribati;
 2. Entry into the market of private providers (an American company is partnering with one of the larger private owned local to provide internet services); and
 3. Government-owned TSKL was bought earlier this year by Amalgamated Telecom Holdings (ATH).
- Outer island connectivity support: More outer islands have internet connections thru PACRICS. Almost all of the 17 islands in the Gilberts Group have telecentres operated by their Island Councils; and,
- All outer island-based secondary schools have internet connections provided by Government.”

Significantly, the once sole telecommunications provider, Telecommunication Services Kiribati Ltd. (TSKL), was bought in May 2015 by a Fiji-based company, Amalgamated Telecom Holdings (ATH), the parent company of Vodafone Fiji, for AUD 7.5 million. The new company, Amalgamated Telecom Holdings Kiribati Limited (ATHKL) has taken over the operations of TSKL, and plans are in place for this new company to expand mobile phone and Internet connections to the outer islands. In the takeover, “ATHKL did not acquire TSKL’s assets on the Outer Islands (which comprise all islands other than South Tarawa, Betio and Kiritimati); however, ATHKL is to have the right to use these assets subject to maintaining them.” Furthermore, the CCK and the Ministry of Communications, Transport and Tourism Development (MCTTD) are working together to implement the project under their roles prescribed in the Communications Act.

National Priorities, Policies and Initiatives on ICT in Education

The Education Sector Strategic Plan (ESSP) 2012–2015²⁸ emphasises having a high-quality and relevant school curriculum by the end of 2015. During the reform process, an ICT policy for education and media-enhanced learning in schools, with a view to future developments in this area, was also planned.²⁹ The ESSP 2012–2015 entails comprehensive reforms of the current syllabus, which are scheduled to be completed by the end of 2015.

Kiribati has an “Education for Free and Compulsory-Aged Children” policy, which serves children in compulsory education from age six (primary) through to age 15 (junior secondary), part of the focus of the “Basic Division” of the Ministry of Education (MOE). The division is also responsible for principals and teachers “to ensure quality teaching and learning is maintained at the highest level and in line with the approved curriculum” (Republic of Kiribati, n.d.).

Whilst schooling is free until junior secondary and attendance is compulsory, “a significant proportion of children in the primary and junior secondary age groups do not attend school. Students who fail competitive examinations at Year 9 and Year 11 are unable to continue their studies. This factor – and the school fees charged by all senior secondary schools – contribute to a high attrition rate amongst older school-age children” (International Council for Open and Distance Education, n.d.[a]).

²⁸ http://planipolis.iiep.unesco.org/upload/Kiribati/Kiribati-ESSP_Education-Sector-Strategic-Plan_2012-15.pdf

²⁹ <http://www.fosigrid.org/oceania/kiribati>

Levels of Instruction³⁰

Pre-Primary Level

Early childhood education (ECE) is largely provided by church agencies, community groups and private teachers. Community-run centres operate in the outer islands. There are now over 200 early childhood centres across the country, and a peak NGO, the Kiribati Early Childhood Education Association (KECEA) exists. The Kiribati government has little formal involvement in the provision of ECE. However, an ECE policy was released in 2009. This policy is intended to serve as a regulatory framework for all ECE providers in Kiribati.

Primary Level

There are 91 government-run primary schools in Kiribati. The Kiribati government is the sole provider of primary education. Almost 30 per cent of all primary-age students are not enrolled in a primary school due to logistical constraints. The cost of maintaining and operating schools on outlying islands is prohibitive.

Secondary Level

Less than 20 per cent of the primary students are successful in gaining a place at the secondary schools. However, they can continue to attend primary school for grades 7–9. The secondary schools are modelled on a junior (Forms 1–3) and senior (Forms 4–6) structure. There are 24 junior secondary schools, 16 senior secondary schools and two combined/junior secondary schools. About 25 per cent are government-run; the rest are run by religious groups. The government provides financial support to both public and non-government schools.

Technical and Vocational Education and Training (TVET)

Six government institutions offer TVET training in specific fields:

- The Kiribati Institute of Technology offers short courses in the building trades, carpentry, vehicle maintenance, computer skills and business studies, adult education and engineering. Most courses are pre-diploma level, although there are a small number of diploma qualifications.
- The Kiribati Police Academy offers pre-service training for recruits to the Kiribati Police.
- The Kiribati School of Nursing runs courses leading to a Certificate in Midwifery and a Diploma in Nursing and Obstetrics.
- The Kiribati Teachers College offers certificate- and diploma-level teacher training for primary and junior secondary teachers.
- The Fisheries Training Centre (FTC) offers seamanship training to the level of rating (Deck, Engine and Fishing) for Kiribati men intending to work on commercial fishing vessels. Qualifications on offer also include an upgrading course for qualified fishermen.
- The Marine Training Centre (MTC) offers basic training courses in deck, engine-room and catering work, including a number of certificate-level programmes. German shipping companies provide the main employers for graduates of the MTC.

There are also a number of religious-affiliated training bodies:

- The Tangintebu Theological College trains future pastors for the Kiribati Protestant Church.
- The Christian Institute for Community Development (CICD) is a vocational school for young people who have dropped out of mainstream education, with an enrolment of more than 100 students.
- The Vocational Institute trains early childhood teachers.

In addition to institutions offering formal qualifications, there is a significant non-formal sector. Local NGOs and church bodies are active in providing non-formal education and training programmes in the

³⁰ Information in this section is from the International Council for Open and Distance Education (n.d.).

areas of nutrition and health, water and sanitation, agroforestry, small-scale food production, local community planning and decision-making, recycling, environmental issues and small business development.

Higher Education

Pre-Tertiary and Tertiary Education

Kiribati students successful in their Year 11 exams can also continue to Years 12 and 13. These provide the equivalent of a foundation programme for university entrance.

The major provider of tertiary education in Kiribati is The University of the South Pacific (USP). In 2008, student enrolments at the Kiribati campus were 476 EFTS (equivalent full-time students) in a wide range of programmes: preparatory, foundation, certificate, diploma and degree studies. The first Extension Centre was established in 1976 and became a USP campus in 2006. As in other USP member countries, the campus allows students in Kiribati to choose from hundreds of USP courses available by distance and flexible learning. Students with access to the Kiribati campus can listen to lectures broadcast from Fiji, make use of audio- and video-conferencing facilities and use the USPNet system for communication with lecturers and other students. As seen in other countries, USP offers a wide range of subjects and at different levels, from certificate programmes to post-graduate qualifications. Print-based study materials have been the primary method of distance delivery, supplemented by a range of different media: audio/video tapes, CD-ROMs and DVDs, satellite-based video-conferencing and audio-conferencing, and eLearning using the Moodle platform. However, the university is moving towards its goal to eventually offer courses fully online.

The Pacific Open Learning Health Network (POLHN) computer lab in Tungaru National Hospital, on the island of Tarawa, has also been used to deliver a wide range of self-paced courses in nursing, health and medical technology in Kiribati using the Moodle platform. Accessible to all, registration in these courses is necessary only when the student intends to sit for the final exam. Passing the final exam allows the student to save or print a Certificate of Achievement. In addition to its own courses, POLHN has selected a range of short online courses from other providers. POLHN's selection includes 90 courses from Lippincott's Nursing Centre range and 50 radiology courses from the Philips Online Learning Centre. POLHN also provides a one-week online introductory course in POLHN eLearning, which is offered at regular intervals for new participants.

ICT in Education Policies, Strategies and Programmes

Until recent years, ICT in education proceeded at a slow pace and was a low priority for the government, which had few plans to introduce modern technologies into the teaching-learning process. Although ICT regulations have been developed, the same cannot be said about ICT in education. However, the E-Education Skill Development and Entrepreneurship Policy Documents now include the MOE Education Strategic Plan 2012-2015 that is currently being implemented alongside the vision of universal access. The policy includes two important aspects:

- Outer island connectivity support: More outer islands have Internet connections thru PACRICS (the Pacific Community Rural Internet Connectivity System). Almost all of the 17 islands in the Gilberts Group have telecentres operated by their island councils.
- All outer island-based secondary schools will have Internet connections provided by the government.

Further development of ICT in education has been constrained by the poor state of communication infrastructure. However, at the meeting of the Education Partners in Kiribati (EPiK) in April (2015)³¹ it was agreed that three Working Groups would be established namely ICT, Infrastructure, and Early Childhood Care and Education. The TOR for the Working Groups is being finalised. The meeting also agreed to have the MCTTD chair the Group. EPiK is comprised of all national education stakeholders in Kiribati as well as the development partners/aid donors.

³¹ Personal communication from Dr. Uentabo Mackenzie, Director, USP Kiribati Campus (June-July 2015).

Key Agencies/Institutions and Ministries Involved in TEL

Two division of the MOE – Technology Support and Information Management (TSIM) and the Kiribati National Library and Archives – are directly involved in TEL. Since 2014, the National Library has housed “green laptops.” TSIM is responsible for two main areas of work: technical support and information management. These include ICT infrastructure development, asset management and maintenance, ICT policy development and implementation, and ICT training and user support.

Other institutions include the USP Kiribati campus, Kiribati Institute of Technology, King George V School and Moroni High School.

Institutions Offering Courses Using Technology (Especially Online Learning)

Only USP Kiribati is offering formal online learning. Programmes available range from pre-degree (foundation and pre-foundation) through the College of Foundation Studies (CFS), to vocational levels through USP’s Pacific Technical and Further Education (PacTAFE), to degrees (for example, in information technology and information systems, law, mathematics), and post-graduate level (education, development studies, and environment-related).

Major Initiatives

Kiribati Telecommunications and ICT Development Project³²

Improving access to ICT in some of the world’s remotest locations, to create new opportunities, this project commenced in February 2012, following the signature of the first PRIF grant agreement. It is expected to conclude by June 2017. With a more competitive telecommunications sector, which supports private sector participation and competition, Kiribati is expected to have improved service coverage and quality for the majority of its citizens, and sector institutions better equipped to oversee a competitive market, in the interests of service users.

Until 2014, the sole service provider, TSKL, provided telecommunication services to the country and had planned a mobile network expansion to some outer islands close to the capital, South Tarawa. Projections at the time indicated that fixed and mobile phone coverage in Kiribati would not exceed 20 per cent by the end of 2012, which was still very low by global and regional standards. The ICT sector in Kiribati thus needed new investment for services to expand.

In November 2014, an announcement that the Government of Kiribati had signed with Kacific to provide broadband services signalled the start of rapid improvement in the country’s infrastructure.³³

USP Initiatives (USPNet and mLearning Strategies)

The USP Kiribati campus provides opportunities for using technology to access learning through the USPNet satellite network, for distance and flexible learning in formal and vocational programmes. Through this, students can access online courses and have unlimited Internet access to use the university Moodle platform to interact with lecturers, tutors and students at other campuses, as well as to access library databases and email.

mLearning support activities have recently been made available to USP students at all 14 campuses of the university (trialled first in 2012 at the Laucala campus in Suva and now being used by other campuses). This initiative involves the use of tablets, iPads and SMS messaging from the Faculty of Science, Technology and the Environment in the drive to keep in touch and encourage students to continue (and not drop out). As well, several campuses including Kiribati have proceeded to provide wireless access for students. This helps where there are insufficient PCs to support the enrolled numbers.

³² <http://www.worldbank.org/en/results/2012/08/02/kiribati-telecommunications-and-ict-development-project>

³³ <http://www.wholesaleinvestor.com.au/kacific-to-provide-broadband-services-to-kiribati-government/>

PacRICS Project

The government-owned TSKL launched an initiative in which all eight secondary schools, the tertiary training schools and one nursing school were provided with two computers, each having Internet access each. The computers and the connections were provided by TSKL and the schools were then to be charged for an Internet connection at USD 2.80 per hour.³⁴

In addition, nine telecentres were established in island councils, using PacRICS, funded by the Government of Kiribati and with some assistance from ITU and SPC. These will benefit rural dwellers, particularly with communications from their remote areas.

One Laptop per Child (OLPC)³⁵

In July 2010, the Hon. Toakai Koririntetaake, Minister for Education, announced that Kiribati was to implement an OLPC trial programme. The distribution of 2,000 XO laptops in primary schools was scheduled for 2011, together with the provision of teacher training and curriculum integration workshops. The minister said Kiribati would deploy OLPC “to improve our national standards in literacy and numeracy, to teach our children new lifelong skills, and boost the long-term economic development of our country. Kiribati faces severe challenges in population growth, health and sanitation, and climate change, and has embraced OLPC as a catalyst to breaking the cycle of poverty.” To oversee the OLPC project, the MOE appointed a “senior level OLPC Country Working Committee to manage the distribution of laptops and to address key issues such as curriculum integration and teacher training. Kiribati will measure OLPC’s impact on basic literacy and numeracy, in line with the AusAID-funded Kiribati Education Improvement Plan (KEIP)” (OLPC Oceania, 2010).

The following provides the most recent update available on the laptops from the original OLPC project:

In May 2014, the Kiribati National Library installed a number of green laptops for use by children. They were originally part of an initiative in 2010 to trial “One Laptop per Child” (OLPC) and were donated by Oceania OLPC and oversighted by SPC. Recently they were installed by Dennis Pack, an AVI volunteer in the Ministry of Education. It is a trial programme which has seen a large number of students on Tarawa access educational activities like Paint Activity, Abacus Activity, Speak Activity, Chart Activity, Tam-tam and many more. The laptops are available Monday, Wednesday and Friday. The Ministry of Education is investigating the capacity in all schools to access this technology through internet access on all islands and laptops within schools. This is a long term goal to deliver education to remote islands in a more effective way. (Republic of Kiribati, 2014)

COL Assistance to the Kiribati Institute of Technology³⁶

COL has assisted staff at the Kiribati Institute of Technology to establish video production and DVD duplication facilities at Kiribati Video, an NGO that functions as the institute’s video resource unit. In recent years, Kiribati Video has released more than 100 DVD titles on topics such as health, disability, the environment, civil society, good government, Kiribati history and culture, family and social issues. These titles are distributed to islands across Kiribati and provide an essential resource for community education.

Support for OER

Kiribati is a member of the Virtual University for the Small States of the Commonwealth initiative, which is developing a range of OER for use across the Commonwealth. WikiEducator includes a series of pages on education in Kiribati, established as part of the Kiribati Wiki Content Free Initiative.

³⁴ <http://www.worldbank.org/en/results/2012/08/02/kiribati-telecommunications-and-ict-development-project>

³⁵ <http://www.olpcoceania.org/2010/07/kiribati-puts-xo-into-education-plan.html>

³⁶ http://www.icde.org/projects/regulatory_frameworks_for_distance_education/country_profiles/kiribati/education_system/

Prospects and Challenges for TEL

Prospects

With the recent announcement of Kacific satellite services in Kiribati, the prospects are for rapid improvement in ICT. It follows that much-needed communications technology to enable learning will soon be a reality and should lead to improvements in the support for education. That is:

- With a more competitive telecommunications sector, which supports private sector participation and competition, Kiribati is expected to have improved service coverage and quality for the majority of its citizens, and sector institutions better equipped to oversee a competitive market, in the interests of service users.
- An improved telecommunications infrastructure will increase IT access for educational purposes.
- The vision that all outer island-based secondary schools will have computer labs with Internet connections provided by the government should be a reality in the near future.
- Rural dwellers will have Internet access at the PacRICS telecentres.

Challenges

The challenges have been mainly due to the high cost of ICT services, both in absolute terms and in comparison to prices charged for similar services to other countries in the region. A recent benchmarking survey showed that international calls from Kiribati are the highest in the Pacific region. The main reasons for the limited and costly service include:

- the monopolistic market structure, which limited opportunities for new capital investment in the market – as noted, this is now being resolved with an increase in competition;
- the difficult operating environment, including costly international satellite bandwidth (Kiribati does not have access to a submarine fibre-optic cable) and limited revenue streams;
- the lack of scale and difficulties in recruiting and retaining experienced technical staff; and
- the high costs of maintaining services on remote and sparsely populated islands.

However, with the Kacific services being established, and the Telecommunication Act opening up competition, these challenges are diminishing.

Nauru

Introduction

Situated 42 kilometres south of the equator, Nauru is a tiny island north-east of Australia, with a land area of 21 km². A coral reef surrounds the entire island, which is dotted with pinnacles where phosphate has been excavated. Phosphate mining remains Nauru's main source of revenue.

The population at the last census (2011) was 10,084³⁷ with a gender ratio of 100 males to 96 females.³⁸ The population density is approximately 476.19 km². The people of Nauru are comprised of 12 tribes, symbolised by the 12-pointed star on the Nauru flag, and are believed to be a mixture of Micronesian, Polynesian and Melanesian descent. The language is Nauruan, but English is widely spoken, as it is used for government and commercial purposes.

National ICT and Internet Access

Government telecommunications are under the Department of Telecommunications, which consists of two divisions: the Regulatory Directorate and the Information Communications Technology Department (ICT Department). The ICT Department is responsible for all government communications and information systems, and its services include: layout of network infrastructure; communication and Internet connectivity; management and maintenance of Nauru government IT equipment and software; and hardware support for IT systems. Internet connections are available either at Cenpac's Internet café at the Civic Centre or by buying a WiMax unit from the ISP Digicel. SIM cards may be purchased from Digicel's main office.

Table 3. ICT access and use in 2012³⁹

ICT	Data
Mobile cellular telephone subscriptions	6,800
Mobile cellular telephone subscriptions per 100 inhabitants	65.57

ICT Initiatives⁴⁰

Until recent years, telecommunications on Nauru were extremely poor, as the lines had been installed in the 1970s. Dial-up access was unreliable and expensive. There was no mobile phone service. In 2007, a solar-powered, island-wide Wi-Fi network was installed. This initiative was unsuccessful for technical reasons, being unsuited for the island topography and vegetation. More recently, Digicel Pacific has provided Nauru with mobile phone services and basic Internet connectivity. Island-wide radio and TV coverage in Nauru is now available. These initiatives have transformed the ICT environment on the island, although use of ICT in distance education remains currently restricted to services provided by the USP.

Education

Training and educating the people of Nauru is the priority of the Government of Nauru and the Department of Education, to prepare and equip Nauru's future generations for the challenges ahead. The vision is to nurture students in Nauru to achieve academic excellence through training to develop Nauru's future leaders and entrepreneurs. As the former President Scotty stated, the Nauru Sustainable Development Strategy 2005–2025 is a platform for a "vision of a future where individual, community,

³⁷ http://www.spc.int/sdd/index.php/en/downloads/cat_view/28-pacific-data/104-populations-a-demographic-indicators_NR

³⁸ http://www.spc.int/sdd/index.php?option=com_docman&task=doc_download&gid=158&Itemid=42&lang=en

³⁹ <http://www.cto.int/country-ict-data/pacific/ict-data-for-nauru/> and <http://www.cto.int/media/ICT-data/nauru.pdf>

⁴⁰ http://www.icde.org/projects/regulatory_frameworks_for_distance_education/country_profiles/nauru/education_system/

business and government partnerships contribute to a sustainable quality of life for all Nauruans” (Government of the Republic of Nauru, 2009, p. i).

The mission of Nauru education is to ensure that

- every Nauruan is literate and numerate and recognises the importance of and the right to education;
- there is access to and equity in education and training, and standards are comparable to the highest in the region; and
- students leave the Nauruan education system enriched and equipped to be productive members of the workforce, to be qualified, to access further specialised training opportunities outside Nauru and to be independent individuals.

The goals are outlined under the National Sustainable Development Strategy 2005–2025, which states that the aim of the Department of Education is to “provide a learning framework and environment that directs students on the footpath that leads them to leaving school as confident citizens able to live in, and contribute to, both Nauruan society and a complex, global, networked society” (Government of the Republic of Nauru, 2008, p. 6). The department is thus the vehicle of commitment and opportunity to provide excellent and quality lifelong learning for all.

The near collapse of the education system during 2000–2005 – when schools on the island barely functioned, exams were not held, maintenance of school buildings ceased, teaching materials were unaffordable, teachers went unpaid and teaching effectively broke down – led to a sharp decline in the number of schools at all levels and the departure of most skilled teachers. The effects of the crisis have continued after 2005, including a severe shortage of skilled teachers due to the permanent departures of many expatriates. In 2008, less than nine per cent of teachers in Nauru had a degree qualification. Half had only a basic certificate, and over 30 per cent had effectively no qualifications, being classified as trainees.

The reconstruction of the education system has been accompanied by wide-ranging curriculum reforms. In 2006, a new student-oriented curriculum was introduced: Footpath. This is a unique, task-based curriculum – founded upon New Basics and Rich Tasks – designed to encourage students to remain in school and to broaden the opportunities available to school-leavers. Another significant reform was the 2010 decision to extend the school day in primary and secondary schools to 3:00 pm. Previously, students in Nauru had spent one and a half hours less in the classroom than the Pacific average. There is also a renewed focus on job-oriented education and the development of TVET.

Education System⁴¹

Education in Nauru is compulsory for children ages five to 16. There are 12 schools in Nauru, including four primary and three secondary. There is an Able/Disabled Centre for children with special needs. Education at these schools is free. A project to assist in improving educational performance in Nauru upon the refurbishment of Nauru Secondary School began in 2007 and was completed in 2010. Australia’s AusAID provided AUD 11 million in funding. Part of the project focused on enhancing Nauruan construction capacity.⁴²

⁴¹ http://www.icde.org/projects/regulatory_frameworks_for_distance_education/country_profiles/nauru/education_system/ and

https://en.wikipedia.org/wiki/Education_in_Nauru

⁴² “Nauru: Education support.” Department of Foreign Affairs and Trade (Australia),

[http://web.archive.org/web/20140223040056/;](http://web.archive.org/web/20140223040056/)

<http://aid.dfat.gov.au/countries/pacific/nauru/Pages/initiative-education-support.aspx>

Enrolments⁴³

Table 4. Nauruan school enrolment figures

2013 Data	Number of Schools	Students per Teacher	Number of Students			Number of Teachers		
			Male	Female	Total	Male	Female	Total
Preschool	5	19	418	333	751	1	39	40
Primary	4	53	755	720	1475	1	27	28
Secondary	3	32	488	476	964	12	18	30

Levels of Instruction⁴⁴

Pre-Primary Level

There are two (or three) years of pre-primary education: preschool and a school preparatory year. Nauru currently has four infant schools, which have recently been refurbished through Australian aid.

Primary Level

The first six years of formal education are within a primary school model covering Grades 1–6. To officially complete primary education and be awarded the Nauru Primary Certificate, students need to successfully sit a national examination. There are four primary schools; two are government-owned and managed, and the other two are church-run, one of which is also partially funded by the Nauru government. Lessons are officially in English, but Nauruan is commonly spoken in the classroom.

Secondary Level

The next four years (Forms 1–4) are within a compulsory secondary school model either at the single secondary school, the technical school or the mission school. Students may elect to do two additional years of secondary education as preparation for tertiary entry. There is a single, government-run secondary school on Nauru, housed in a new school complex completed in 2010. The school now includes adult learning TVET training facilities. The curriculum at the school is also being reoriented toward vocational education.

Technical and Vocational Education and Training⁴⁵

TVET efforts have been adversely affected by lack of money, equipment and qualified teachers but remain on the planning schedule. Prior to 2002, the Nauru Vocational Training Centre (NVTC) was the island's major TVET provider, but partial destruction by fire effectively ceased its operations. Currently, the focus of formal vocational and technical training has shifted to the TVET training facility at the secondary school. The government has also provided workshops and vocational training in areas such as business skills for disadvantaged women and youths. A range of NGOs active on the island also provide non-formal training in vocational areas.

Higher Education⁴⁶

The USP Nauru campus is the only higher education institution in Nauru. Indeed, USP policies through USP Nauru campus have a significant effect on the future direction of tertiary education in the country. The campus provides face-to-face teaching in accounting, management, education, early childhood education, library studies and English. The USP study programmes, including continuing education and pre-tertiary levels, are also accessible through the USP distance and flexible delivery modes. The

⁴³ <http://www.spc.int/prism/nauru/index.php#pre-school>;
<http://www.spc.int/prism/nauru/index.php#primary-school>;
<http://www.spc.int/prism/nauru/index.php#secondary-school>

⁴⁴ http://www.icde.org/projects/regulatory_frameworks_for_distance_education/country_profiles/nauru/education_system/

⁴⁵ Ibid.

⁴⁶ Ibid.

Nauru campus is the major – and almost the only – distance education provider on the island. It offers students audio- and video-conferencing facilities, a library and a computer laboratory, as well as Internet and email access. USP students at Nauru can choose from the hundreds of distance education courses available. Nonetheless, distance enrolments at the Nauru campus are extremely low. In 2008, the EFTS load was only 20 students, in part due to the pipeline effects of the chaotic conditions of 2000–2005. Enrolments have since increased.

Students wishing to undertake tertiary studies also have the opportunity to apply for competitive government scholarships to study overseas.

Major Initiatives

USP Initiatives⁴⁷

Programmes in IT and other subject areas are available online. The USP campus presence provides opportunities for using technology to access learning through the USPNet satellite network for distance and flexible learning in pre-degree, vocational, undergraduate and postgraduate programmes. Through USPNet, students can freely access the Internet and use the university Moodle platform to interact with lecturers, tutors and students at other campuses.

mLearning support activities have recently been made available (trialled first at the main campus in Suva and now being used by other campuses), an initiative by the Faculty of Science, Technology and the Environment in the drive to keep in touch and encourage students to continue (and not drop out). It involves the use of tablets, iPads and SMS messaging.

The Nauru campus⁴⁸ is located in Aiwo District. USP began teaching remote courses in the 1970s. Distance courses have been available in Nauru since the early 1970s, when they were facilitated through the Nauru Education Department. The USP Centre in Nauru was officially opened in October 1987 to serve a population of about 11,000. Nauru campus provides tutorials and face-to-face courses for the following programmes: accounting, management, Bachelor of Education (Primary), early childhood education, English and library and information studies.

The campus offers face-to-face courses in pre-school teacher education, nutrition and disability studies and offered the Community Workers Certificate in 2006. Workshops on computing and bookkeeping are offered in the Continuing Education programme.

OLPC

Nauru was an active participant in the OLPC Oceania project. As described elsewhere, this was a joint initiative of the Secretariat for the Pacific Community (SPC), the One Laptop per Child Foundation, OLPC Australia and OLPC New Zealand. In 2009, two schools in Nauru were provided with XO laptops on a pilot basis. A repository of lesson plans authored by Nauru primary teachers has been created on WikiEducator but currently has only one contribution. At the time of writing, no further update was available.

Radio Pasifik-Nauru⁴⁹

This is a community-based educational radio station launched in 2007. The station is designed to assist students on Nauru with overcoming isolation, frequent power cuts and the scarcity of transportation and fuel. Radio Pasifik-Nauru is a truly innovative project. It uses a solar-powered, 30-watt FM “radio in a suitcase” obtained through COL. The station broadcasts a range of programming, including lectures and tutorials recorded weekly at USP in Fiji. Each week, these recordings are sent digitally to Nauru and re-broadcast over Radio Pasifik-Nauru. USP lectures and tutorials comprise about half the station’s programming. The rest consists of local programming or pre-recorded segments on current

⁴⁷ <http://www.usp.ac.fj>

⁴⁸ http://www.usp.ac.fj/index.php?id=usp_nauru_home

⁴⁹ http://www.icde.org/projects/regulatory_frameworks_for_distance_education/country_profiles/nauru/education_system/

affairs and topical interests. Most notably, programming includes audio files produced by universities in Australia, the UK, Canada, the USA and New Zealand, and from social media sites. Radio Pasifik-Nauru demonstrates that innovative approaches can succeed in delivering distance education even under conditions of extreme isolation.

Support for OER⁵⁰

The Nauru government has expressed its support for COL's Virtual University for the Small States of the Commonwealth (VUSSC), a project concerned with the collaborative development of open courseware. The development of open courseware is also an element in the OLPC Oceania project.

Prospects and Challenges for TEL

Prospects

- Children will improve their learning and spend more years at school.
- ICT training to use library resources will help learners in the schools.
- Increased teacher training – through the online USP programmes.

Challenges

Nauru needs:

- resources to deliver quality teaching and learning and
- an additional budget to procure sufficient resources.

⁵⁰ Ibid.

Papua New Guinea

Introduction

Papua New Guinea (PNG) comprises the eastern half of New Guinea, as well as many surrounding islands, including New Britain. The central core of the main island is mountainous, with deep, green valleys dotted by mysterious and remote villages. There are still no significant cross-country roads from the capital city, and most vital transportation depends on small aircraft and the over 400 isolated airstrips.

In the July 2011 census, the population was 7,275,324, of which 12.6 per cent lived in the urban areas. The gender ratio was 104 males to 100 females.⁵¹ A majority of the inland population lives in primitive conditions. There are over 700 different languages spoken amongst the various native tribes.

National ICT and Internet Access

The following data show the situation in 2012.

Table 5. ICT access and use⁵²

Fixed (wired) broadband subscriptions per 100 inhabitants	0.13
Estimated Internet users per 100 inhabitants	2.30
Fixed telephone subscriptions	139,000
Fixed telephone subscriptions per 100 inhabitants	1.94
Mobile cellular telephone subscriptions	2,709,000
Mobile cellular telephone subscriptions per 100 inhabitants	37.78

The dramatic difference between fixed and mobile user numbers is similar to elsewhere in the Pacific Island nations.

Less than one per cent of the population has fixed broadband, a technology that remains far beyond the affordability of average citizens and small businesses. Some of the main constraints to widespread broadband Internet development in PNG include the high cost of international connectivity, due to capacity constraints as well as regulatory factors, and the lack of high-capacity domestic backbone networks.

The solution is to substantially improve the telecommunications infrastructure – for example, through the Rural Communications Project.⁵³

National Information and Communications Authority (NICTA)⁵⁴

In 1996, the Telecom Act and Radio Spectrum Act were introduced, followed by the Telecom Industry Act 2002 and ICC Act 2002. Prior to 2007, the prices of ICT services were very high. With the establishment of NICTA in October of 2010, full liberalisation helped lower costs and increased access to ICT services. Consequently, competition opened up, and the ICT industry became regulated.

Education

Basic education is free in Papua New Guinea for students aged six to 14. The Department of Education published a national educational plan in 2004, titled *Achieving a Better Future*, meant to guide the nation's educational development from 2005 to 2014. The main objectives of this plan included:

⁵¹ http://www.spc.int/sdd/index.php?option=com_docman&task=doc_download&gid=158&Itemid=42&lang=en

⁵² <http://www.cto.int/country-ict-data/pacific/ict-data-for-papua-new-guinea/>

⁵³ <http://www.worldbank.org/projects/p107782/rural-communications-project?lang=en/>

⁵⁴ www.nicta.gov.pg; <http://www.apecdoc.org/site/png/2011/09/23/ict-authority-nicta-launched>; and http://www.acma.gov.au/webwr/_assets/main/lib312019/4.2%20plenary;%20session%20focussing%20on%20needs%20of%20asia-pacific%20%28une%20o'omi%20nicta%29.pdf

universal access to education; improved retention rates; improvement of teacher deployment for primary schools; improvement of quality, curriculum and teacher development for secondary schools; and emphasis on shorter, more concise vocational courses. The plan also included issues of teacher education, management within the Department of Education (including representation from communities), and financing of the plan. The national goals and directives of the PNG Constitution influenced the plan. These goals and directives include:

- integral human development;
- equality and participation;
- national sovereignty and self-reliance;
- natural resources and environment; and
- Papua New Guinea ways.

In addition, the National Executive Council of PNG developed a framework in 2009 for long-term development. This “Papua New Guinea Vision 2050”⁵⁵ emphasises human capital development, gender, and youth and people empowerment as some of the seven strategic focus areas. The ultimate goal of the strategies is to make PNG amongst the top 50 countries in the United Nations Human Development Index.

National Department of Education

At the central level, the Department of Education⁵⁶ is responsible for school education and the preparation and implementation of education plans, including policy on core functions relating to curriculum, standards, teacher education, staff development and in-service training, and special education. The Secretary for Education co-ordinates the introduction of education policies and ensures their implementation in the provinces and by local governments.

In 2009 the Department of Education developed a strategic plan for 2010–2019 to establish universal basic education⁵⁷ (UBE). The overarching goal of the UBE plan is: all children of school age must enrol in school, must complete nine years of basic education and should have learned skills, knowledge and values covered in the basic education curriculum. This curriculum varies with each level of education and is organised into learning areas and subjects, such as: culture and community; language; mathematics; personal development; and science.

PNG has a decentralised education system under the Organic Law on Provincial and Local Level Government, which gives the provinces responsibility over planning, financing, staffing and maintaining general education institutions up to Grade 12. This includes pre-school, elementary, primary, secondary, and vocational schools.⁵⁸

Levels of Instruction

Pre-school education, including elementary education, is not compulsory. Children begin elementary school at age six, and instruction is in a language that they already speak. For three years, they develop the basis for sound literacy and numeracy skills, family and community values (such as discipline), personal health care and respect for others.

At nine, children continue their basic education in a “primary” school, lasting six years. This is the second stage of basic education. In primary school, children begin a bilingual programme that teaches them the skills to contribute to their communities and use English to understand basic social, scientific, technological and personal concepts and values after Grade 8. Primary school is divided into lower (Grades 3–5) and upper (Grades 6–8).

⁵⁵ <http://www.education.gov.pg/QL/plan/png-2050>

⁵⁶ <http://www.education.gov.pg/Home.index/html>

⁵⁷ [http://www.planipolis.iiep.unesco.org/papua/20%New/20%Guinea/Papua New Guinea/UBE 2010-2019.pdf](http://www.planipolis.iiep.unesco.org/papua/20%New/20%Guinea/Papua%20New%20Guinea/UBE%202010-2019.pdf)

⁵⁸ <http://www.education.gov.pg/Home.index/html>

Students who complete elementary and primary schooling may attend secondary school for Grades 9–12. It is divided into lower (Grades 9 and 10) and upper (Grades 11 and 12). The aim of secondary education is for students to reach their personal potential to lead productive lives as members of the local, national, and international communities and partake in further quality education and training, with the benefit of a wide range of subject matter and work to be applied to everyday life.

Vocational education is offered to promote skills that meet the needs of the immediate community. Traditionally, vocational education has been a provincial responsibility. Admission to vocational training centres is for pupils who have successfully completed the basic education programme (through Grade 8).

Post-secondary education

Post-secondary and higher education⁵⁹ are provided at the following institutions:

- The University of Papua New Guinea⁶⁰ (UPNG) offers courses leading to the awarding of a bachelor's degree, which normally takes four years of study; a bachelor's degree with honours requires an additional year. The Open College at the UPNG offers programmes through distance learning. There is also a plan to upgrade this to an open university.
- The University of Papua New Guinea Open College (UPNGOC)⁶¹ provides administrative support to UPNG schools to offer their academic programmes through distance mode. It facilitates the delivery of both sub-degree and undergraduate programmes through the ODL mode. This unit was established in 2002 by converting the former Institute of Distance and Continuing Education into the Open College, thereby, enabling UPNG to become a dual-mode university. The structural and administrative setup of UPNGOC is three-fold: (i) Programme Development and Production, (ii) Centre and Student Support and (iii) Professional and Continuing Education. A network of study centres is established throughout PNG and one campus in the Solomon Islands to deliver all ODL-based programmes.
- The University of Technology⁶² awards a Bachelor of Technology degree after three to five years of study.
- The University of Goroka⁶³ offers undergraduate and post-graduate degree programmes in secondary education.
- The Divine Word University⁶⁴ offers a wide range of undergraduate and post-graduate degree programmes.
- The Pacific Adventist University⁶⁵ offers a range of undergraduate and post-graduate programmes in business, education, nursing, social science, science and theology.
- Primary teacher training colleges offer a three-year diploma course for Grade 12 graduates. The UPNG offers a four-year course leading to the Bachelor of Education degree. A one-year post-graduate diploma in education is also offered.

ICT in Education: Policies, Strategies and Programmes

Education Act 1983⁶⁶

The Act provides for (i) the national education system, and (ii) national and provincial responsibility in the field of education.

⁵⁹ http://www.ibr.unesco.org/file.admin/user_upload/Publication/WDE/2010/pdfversion/Papua_New_Guinea.pdf

⁶⁰ <http://www.upng.ac.pg/>

⁶¹ <http://www.upng.ac.pg/index.php/open-college>

⁶² <http://www.unitech.ac.pg/>

⁶³ <http://www.uog.ac.pg/>

⁶⁴ <http://www.dwu.ac.pg/en/>

⁶⁵ <http://www.pau.ac.pg/>

⁶⁶ <http://www.paddle.usp.ac.fj/collect/paddle/index/assoc/png016.dir/doc.pdf>

National Training Priorities (2003–2005)⁶⁷

The National Training Priorities of the National Training Council are based on extensive consultations with enterprises, industry associations and communities across the nation. Economic, occupational and skill priorities are identified, along with pointers to strengthen the effectiveness of TVET.

TVET and Training Policy⁶⁸

This is the first ever national policy formulated by the Department of Education for the development of skilled technician levels in the workforce. The policy presents the vision, rationale, strategies and action plan that would bring the public TVET system to higher levels of quality and efficiency.

Major Initiatives

Rural Communications Project

The objective of the Rural Communications Project⁶⁹ is to facilitate improved access to affordable and reliable telecommunications in rural and remote areas of PNG, thereby providing telecommunications access to nearly 500,000 rural Papua New Guineans and facilitating broadband Internet access in rural district centres that currently do not have any Internet services.

By August 2017, the project is expected to contribute to many social and economic development objectives in the country:

- Local businesses will experience lower communications costs and improved access to information about markets and prices; potential for new businesses, tourism and services such as Internet cafés will be created; and rural communities will gain easier access to information on health, education and job services, and will have closer contact with distant family members.
- As in many previously isolated communities around the world, women are also expected to benefit from improved access to communications – for example, through income-generating opportunities and family contacts.
- The project will provide technical assistance to the Department of Communication and Information to strengthen ICT policy development and to the NICTA to address emerging regulatory challenges and strengthen the competitiveness of the telecommunications market.
- It will help establish a universal access and service regime and associated fund to develop regulations and operating procedures.
- Under this project, Digicel (PNG) Limited is installing telecommunication points of contact in 59 sites across all four regions of the country, providing telecommunications services to nearly 500,000 currently unserved people in rural areas.
- This one-time subsidy, combined with existing initiatives by mobile operators, was expected to boost total population coverage from about 20 per cent in 2009 to around 93 per cent by the end of 2014.
- A demonstration project for Internet service will also provide a one-time capital subsidy to prospective bidders to increase broadband access and establish public Internet access points in rural district centres.

UPNG Open College

As described earlier, UPNG has set up this unit, which serves/supports students studying at a distance. There is a plan to develop it into an open university. The present unit has expanded to the Solomon Islands with the establishment of a campus.

⁶⁷ Ibid.

⁶⁸ www.education.gov.pg/QL_Policies/png-doe-tvet-policy-2005.pdf

⁶⁹ <http://www.worldbank.org/en/results/2014/12/02/papua-new-guinea-rural-communications-project>

OLPC-PNG⁷⁰

In 2009, the PNG Sustainable Development Programme (PNGSDP) started a One Laptop Per Child programme in 11 schools, mostly in mine-affected areas, with implementing partner Divine Word University, one of PNG's most prestigious educational institutions and local partners in the three areas of North Fly, Western Highlands and Telefomin District. These are primarily the Catholic and Baptist education authorities.

The programme consisted of 1,000 laptops and 11 schools, with full server/wireless and solar-power infrastructure. Schools with no power sources were able to participate because all laptops were issued with the innovative "DC Share" solution, consisting of 15W thin-film solar panels and cables, allowing the laptops to be charged whilst in use in the classrooms, with no need for an expensive fixed solar-power infrastructure. None of the schools are "saturated"; however the programme focuses on building local and national support to sustain the pilots, especially through local sources related to the mine. The first six schools are described below:

- The deployment at Rumginae Primary School, North Fly, was completed with a launching on 7 May 2010. 70 laptops were deployed in three classes and to all teachers. The deployment included teacher training and installation of the school server and a campus-wide wireless network.
- Jim Taylor Memorial School, Kisap, near Mt Hagen, was completed in July 2010, and an official launch took place in October 2010. The deployment consisted of teacher training, as well as 219 laptops issued to six classes and teachers. A server and wireless network was installed, along with fixed solar power for the infrastructure and the DC Share solution for laptops (the school has no grid power or daily-use generator).
- The important basic teacher training for most of the teachers in the remaining six schools in North Fly was completed in the first two weeks of August 2010 at Matkomnae Primary School, along with the installation of a school server and wireless network, with solar power. An action plan was drawn up to complete the school deployments and launch their OLPC projects. A further mission in June 2011 completed the infrastructure and an official launch. This involved two classes, Grades 3 and 4.
- During the training at Kisap, a team from the three Telefomin district schools were trained as trainers. All equipment apart from the flexible solar panels was shipped to the sites, making these schools self-sufficient and ready to launch their OLPC projects.
- DWU deployed 25 laptops with a school server at Callan Services special needs school, Kiunga, in late 2009. The laptops are used to teach children with special needs, including hearing impairment. Additional training and server upgrades were implemented in April 2010 and again in 2011.
- Kompiam International School received 10 laptops in 2009.

Further activities were planned for January 2012, but at the time of writing, no further information was available on this project.

Prospects and Challenges for TEL

Prospects for ICT

- Regulatory barriers will be minimised through appropriate policies.
- Other providers will gain entry more easily, thereby increasing competition and reducing rates.
- Access will increase through affordable connections and reduced retail prices.

⁷⁰ http://wikieducator.org/OLPC_PNGSDP

Prospects for eLearning

- Continuation of the OLPC project or a replacement project of a similar nature would increase access to rural areas.
- Use of online programmes will provide new opportunities, particularly to those unable to attend face-to-face studies.
- Use of new innovations – e.g., tablets – can extend learning opportunities, particularly to those with limited Internet access.

Challenges

- Access to ICT infrastructure and services in PNG is amongst the lowest in the world, particularly in rural and remote areas.
- The economy continues to grow, with major investment projects in the country placing pressure on the existing ICT infrastructure and demanding new services.
- With greater broadband uptake and convergence, definitions of the licensing categories will have to be reviewed as differences in categories diminish.

Samoa

Introduction

Samoa comprises seven islands of volcanic origin, of which five are inhabited. The total land area is 2,860 km². Whilst Samoa has high elevation inland, it is threatened by the adverse effects of climate change, particularly in the coastal and low-lying areas, and efforts to address these challenges are welcome.

Samoa was the first Pacific island nation to become independent, in 1962. In addition to being one of the 12 member countries of the University of the South Pacific, Samoa is a member of the Pacific Islands Forum Secretariat, the Secretariat of the Pacific Community (SPC), the South Pacific Regional Environmental Programme (SPREP) and other regional organisations.

Tourism and remittances are the two strongest factors in the economy, but agriculture and fisheries form the basis at the subsistence level. The private sector plays a significant part in industry and employment.

According to the 2011 national census,⁷¹ the population was 186,340, with 76 per cent in Upolu (141,614), of which 20 per cent resided in the urban area of the capital, Apia. Over 42,000 resided in Savaii. The population is mainly Polynesian, bilingual, and Christian denomination. The 2015 population is estimated at 187,256.

On the Human Development Index (2011), Samoa is 99th out of 187 countries, in the medium human development group.

Samoa's parliament and the central offices of government ministries are located in Apia. Growth and expansion in the capital have been seen in the development of the commercial centre, international and regional offices (e.g., UNDP, WHO, UNESCO, SPREP) and tertiary educational institutions.

National ICT and Internet Access

National ICT development is the primary responsibility of the Ministry for Communications and Information Technology (MCIT). Several ICT developments have occurred over the past three years, including the privatisation of telecommunication services and the establishment of two mobile services. Other more recent developments include wireless services that offer Internet access, the strengthening of the MCIT Regulator's office, and the Ministry of Education, Sports and Culture (MESC) SchoolNet project, offering opportunities to assist learning and teaching online. As outlined in Chapter 1, a new submarine cable system (fibre-optic) project has been confirmed and is expected to be in place in early 2017. This cable will connect Samoa (both Upolu and Savaii) to Fiji and onward through the Southern Cross submarine cable. Costing USD 126 million, funding is through grants from Samoa's development partners: the World Bank's International Development Association, the ADB, Australia's DFAT, and the newly formed Samoa Submarine Cable Company ("Minister welcomes Internet project," 2015).

Changes in the MCIT have included the establishment of the National Information Communication Technology (ICT) Secretariat in 2006 to fulfil the objectives of the National ICT Strategy and its vision of "ICT for All." This is a semiautonomous body working alongside MCIT to implement projects in line with the ICT strategy and to represent Samoa at regional and international ICT workshops. The secretariat staff are experts in ICT and committed to developing ICT in Samoa, giving Samoans access to, awareness of and skills in ICT. The secretariat also provides support for the National ICT Committee, which is chaired by the prime minister. The secretariat's projects have included the education-related initiatives OLPC and Mobile Computer Laboratory (SchoolNet).

⁷¹ http://www.spc.int/sdd/index.php/en/downloads/cat_view/28-pacific-data/104-populations-a-demographic-indicators_SA

National ICT Committee

This was established to develop policies and strategies to steer ICT development in Samoa, including the drive for universal ICT access, sustainable rural connectivity, and ICT programmes in all sectors. Its numerous other aims include conducting research to ensure findings are linked to policy making.

Division of Policy Development, Formulation and Review

The core function of this division is to review and recommend legislation amendments and to develop the government's policy for the communication sector. The division also publicly promotes awareness of these new policies and legislations through press releases and workshops held throughout the country to ensure all people living in Samoa are aware and up-to-date with their nation's communications developments, and it represents Samoa each year at international conferences on communications. Consultations and policy awareness-raising are conducted through workshops throughout Samoa, including the rural areas. In 2008, universal access awareness-raising was a key topic.

Table 6. ICT access and use⁷²

ICT	Data (Year)
Fixed (wired) broadband subscriptions per 100 inhabitants	0.11 (2010)
Estimated Internet users per 100 inhabitants	33.74 (2012)
Fixed telephone subscriptions	88,417 (2012)
Fixed telephone subscriptions per 100 inhabitants	10.10 (2012)
Mobile cellular telephone subscriptions	858,809 (2012)
Mobile cellular telephone subscriptions per 100 inhabitants	98.06 (2012)

Education

Most primary and secondary schools are government operated, but there are several mission schools and a few private schools. The levels of instruction are: preschool: ages two-and-a-half to five; primary: Years 1–8; secondary: Years 9–13. Of these, attendance in primary and secondary are compulsory, and government funding is available to assist with school fees.

The total numbers of schools in 2014 were 164 primary, 36 secondary, six primary-secondary and 107 preschools. In 2015, there were 167 primary, 36 secondary, six primary-secondary, and 106 preschools.

Table 7. Number of government* secondary schools teaching computer studies: 2012, 2014 and 2015

	Year 9	Year 10	Year 11	Year 12	Year 13
2012	4	6	11	11	10
2014	7	7	12	14	14
2015	13	13	15	18	16

Source: MESC Statistical Digest 2012, 2014, 2015

* Twenty-three government schools were listed in the source.

There is a concern that of the annual 900–1,000 school leavers (i.e., who finish Year 13), less than half proceed to higher education, and a very small number find employment.

Samoa has several higher education institutions: National University of Samoa (NUS), University of the South Pacific (USP), Oceania University of Medicine (OUM), Le Amosa (which teaches wholly in Samoan), Australia Pacific Technical College (APTC), and six theological training institutions, of which

⁷² <http://www.cto.int/country-ict-data/pacific/ict-data-for-samoa/>

two now offer degree programmes. Moreover, three trades training programmes are attached to school establishments in mission education systems.

The national Samoa Qualifications Authority (SQA), established in 2005, monitors the post-secondary establishments in terms of standards expected of programme content and delivery, and the requisite resources. Many small, privately operated training initiatives that are registered and accredited by SQA offer short courses in areas such as computer basics, music and second-chance learning, whilst some ministries conduct short training workshops from time to time to build capacity for their staff.

In 2014, the MESC commenced an upgrade of its science teachers to address the acute shortage in this area. USP was able to provide a flexible programme using TEL, including tablets onto which learning materials were loaded to support the teachers, whose lecturers were based in Fiji. Sixty-five teachers commenced the programme: 60 under a government scholarship, four on mission sponsorships and one with private funding. Significantly, this upgrade was enabled through USP's multimode delivery mechanisms of online, blended and face-to-face courses, thus allowing teachers to study from their teaching sites during the term and attended face-to-face courses (flexi-schools) during the school holidays. This has meant that the MESC did not need to seek replacements for teachers undergoing studies.

ICT in Education Policies, Strategies and Programmes

Education Policy Statements on ICT⁷³

These aim to:

- standardise hardware and software for use in schools;
- provide for sustainable preventative maintenance and replacement, and organisational support and procedures;
- provide reliable communication systems through networking by both electronic and other means between all levels of education; and
- take a more strategic approach to the management of ICT so that it could be fully utilised in the delivery of information and education services.

Ministry of Education, Sports and Culture

Two broad functions of the ministry in the area of ICT are provision of support and services and training and education.

For support and services, MESC has also made significant investments in computer hardware, software and training, and it now has a fully integrated computerised system, utilising ministry-specific as well as government-wide management information systems.

For ICT education and training, the ministry designed and developed a National Computer Studies curriculum for Years 12 and 13, which some secondary schools implemented in 2005. Computer Studies was first examined in the 2006 national Year 12 Samoa School Certificate examinations. Year 13 Computer Studies was initially examined in the regional Pacific Senior School Certificate examination, now the Samoa Senior School Certificate. The development and integration of computer and communications technology into education is being implemented through projects such as SchoolNet.

Radio broadcasting has proven effective and has been used widely as an educational tool in direct class teaching, school broadcasting and general educational programmes. The Education Broadcasting Unit broadcasts education programmes to schools through the Samoa Broadcasting Corporation channels and produces CDs for primary schools. Recently, television broadcast programmes included at the preschool levels have been initiated.

⁷³ See Government of Samoa (2006).

To facilitate access to a wide variety of useful resources, the MESC has plans to develop a website to post information online.

Post-secondary education

At the post-secondary level, both NUS and USP Samoa offer formal courses in computing in regular academic programmes, and technical training through their Cisco Academy programmes. USP ICT courses are online, supported by local face-to-face tutorials and Moodle. Both universities also provide opportunities for basic computer training. Other local vocational training centres also offer computer courses. Both USP Samoa and NUS offer computing facilities in PC labs, along with wireless access. There have also been a series of short-term courses for teachers in computer literacy and curriculum development.

Major Initiatives

Samoa SchoolNet

Considered by some as the top “best practice” for ICT in learning in the Pacific, this has occurred in two phases:

- a pilot study involving five schools (3 secondary – 2 Savaii, 2 Upolu, and 1 primary in Upolu) from mid-2000 to 2007;
- following the success of the pilot phase, a nation-wide project that has extended to all secondary schools on both Savaii and Upolu.

The SchoolNet and Community Access Project aims to improve the quality of education in Samoa by providing electronic teaching and learning materials (e-resources) to support teacher development and improved student learning outcomes. All but two secondary schools in Samoa are participating in the project. They all received ICT equipment and the e-library – a comprehensive repository of e-resources covering all grades and content areas for the following priority subjects: science (agricultural science, biology, chemistry and physics), mathematics and English. SchoolNet is implemented by the MESC and funded with a grant from the ADB. According to SchoolNet personnel at the MESC, the key elements of this project are as follows:

- Thirty-seven secondary schools are in the project, comprising all but two of Samoa’s secondary schools.
- SchoolNet provides a huge range of interactive e-resources directly on servers in every school, which can be used by teachers and students. The project focuses on English, mathematics and science, but resources are available for other subjects as well (e.g., there is an encyclopaedia).
- Teachers use the resources in the e-library for their lessons, and students use them for their studies. The Internet is not needed, as everything is provided at the school via its local network. Students and teachers can also use their own laptops to connect to the e-library.
- The reasons for this different approach are Internet cost and availability, as well as the very questionable quality of e-resources available on the Internet. The Internet in general is not a reliable source of resources, and even teachers struggle to ensure that proper quality is achieved. Thus, the project decided to procure a full repository of high-quality e-resources (yteach/Learnetic), with the huge further advantage that all resources are technically set up the same way. A student/teacher who has used one of the resources knows how to use any of the other 25,000+ resources as well.
- All hardware is provided by the project, funded by an ADB grant. Internet costs are very small due to the limited access and are paid for by the project. This will most likely be taken over by MESC.
- At this point, no MESC policy/guidelines have been developed for schools. However, SchoolNet provides a very safe and stable setting that does not need further regulations. For example, users cannot install anything under SchoolNet. Internet use is monitored and filtered, with the same restrictions as at the MESC (i.e., no social media, no YouTube, etc.).

At this time, students are not allowed to bring their own devices, so further policies and guidelines are not yet needed, but they will be necessary in future.

- The main challenge experienced during the project is that teachers are not prepared to use e-resources in the classroom. Even when provided with a library of first-class interactive resources, teachers hardly know how to integrate them into their lessons. So, the idea that by giving them Internet access, everything else would come by itself is incorrect. Teachers need intensive training and mentoring to be able to use these options; without that, everything is in vain.
- Thus, SchoolNet provided a full programme of on-site training and coaching for the project teachers in the schools (English, math, science; Years 12 and 13 first, lower levels later). This was absolutely crucial for the success of the project. This training was not about computer skills but rather about pedagogy: lesson planning and lesson giving.
- SchoolNet currently is only for secondary schools. The MESC intends to extend the network to include primary schools, but that is not part of the current project, which is being funded by the ADB. According to senior management at the ministry, whilst the funding ends this year (2015), the initiative will continue under ministry support. At the time of writing, further details of these future plans are yet to be confirmed.
- Science teachers in the Science Teachers Accelerated Programme (STAP) in the USP-MESC upgrade have been allowed to use the SchoolNet facilities to log on to the USP Moodle platform for their online courses and other support services. They use the SchoolNet Wide Area Network (WAN) to connect to the USP Moodle from their schools, at no charge. To facilitate this innovation, SchoolNet personnel extended the usage options to more general Internet access (excluding social media) for a few hours in the afternoons, facilitated by school principals.

USPNet

USP Samoa (comprising Alafua Campus and Savaii Centre) is taking the lead in ICT enabling and ICT support for education in Samoa, in addition to offering online many programmes and courses up to the post-graduate level, including in IT subject areas. Opportunities for using technology to access learning through the USPNet satellite network, for distance and flexible learning in formal and vocational programmes, are enhanced by ICT facilities and services at the Alafua campus and the Savaii Centre. Through USPNet, students have unlimited Internet access and use the university Moodle platform to interact with lecturers, tutors and students at other campuses. Furthermore, at the Alafua campus, wireless connectivity covers much of the campus learning/teaching areas as well as residential dorms, and students can use the facilities throughout the night, particularly during intensive study periods prior to exams. mLearning support activities have recently been made available (trials first at the main campus in Suva and now being used by other campuses). This initiative uses tablets, iPads and SMS messaging from the Faculty of Science, Technology and the Environment in the drive to keep in touch and encourage students to continue (and not drop out). The Foundation programme has also started using SMS for circulating key messages relating to specific aspects of learning and teaching.

STAP Initiative⁷⁴ – Using Tablets to Provide Course/Study Materials

In line with the MESC vision of an “attractive, dynamic and motivated teaching profession of qualified, trained and committed teachers who are able to encourage and improve student learning,” an MESC-USP partnership commenced in 2014, through which 60 government-funded science/maths/IT teachers are undergoing upgrading to degree level. Others, from mission education systems, also joined the programme. This initiative uses distance and flexible learning courses already available online, or in print or through a blended delivery mode. During the school term, teachers can study from their teaching location using SchoolNet to access Moodle, thus saving time and money instead of travelling to one of the two USP locations. Support for online courses uses materials loaded onto tablets issued to the individual teachers. Other support is through USP’s Moodle platform, which is accessible through the satellite link between the university’s main and regional campuses. In Samoa, this link is available

⁷⁴ http://www.mesc.gov.ws/index.php?option=com_content&view=article&id=354:stap2014&catid=65:latest-news&Itemid=222

at the Alafua campus and at the Savaii Centre, through the satellite link (funded by USP and the Japan International Cooperation Agency) at the MESC public library.

CSL e-Rate⁷⁵

The Computer Services Limited (CSL) e-Rate project is responsible only for Internet access, whilst computer equipment and maintenance are the responsibilities of the school. This project uses the government's Samoa National Broadband Highway (SNBH). e-Rate is funded by the company's technology fund, which is governed by its Board of Directors under a trust fund setup. The aim is to bring all schools in Samoa into the information age. For most schools, accessing the Internet is a real challenge, with technical knowledge and costs being the most significant issues. However, the CSL e-Rate project aims to reduce these challenges by providing safe, secure Internet access. To do so, an e-Rate portal has been established to filter data and block illegal and unwanted materials. Internet policies using best practices have been adopted by Samoa's schools, and each school's usage is also monitored.

As a private information technology company in Samoa, CSL believes that this will introduce appropriate and safe technology to children and youths. At the 2012 launch, CSL CEO Laeimau Oketevi Savea Tanuvasa said:

The Internet is a global library of information that contributes in raising educational standards, promoting students' achievement, supporting the professional work of teachers, to enhance the school's administration systems, and to set an ICT platform for Samoa's future economic development. The success of this project will depend on a mutual and excellent partnership between the main stakeholders – Computer Services Ltd., the primary schools selected, the MESC, the SchoolNet project team, the Government of Samoa, and the community, including parents and families of students.

The first phase of this project had 41 primary schools from the government, mission and private sectors gaining fast Internet access to utilise for school projects and research. Eleven schools followed when their equipment was installed. With the CSL Internet infrastructure continuing to expand, more schools will be given this opportunity. When the project funding ended, schools were offered a plan called Kidznet eRate School Plan: \$50 @10Gb speed. At the time of writing,⁷⁶ 28 schools are still on the e-Rate project: 22 are government, three are mission and three are private. Feedback from those in contact with the schools indicated: "most schools said they cannot afford" or "hardly use it," or "the computer is faulty" and replacements are being sought.

OLPC in Samoa

Samoa was amongst the first countries to be involved in OLPC Oceania. Two primary schools in Savaii – Paia Primary and Laumoli Primary – were selected for this pilot, which was launched in 2010. One hundred and fifty laptops, including a server and Internet access, were provided for this pilot project, which was implemented by MESC, with MCIT providing Internet connectivity through the Rural Internet Connectivity System. To date, this project was considered a failure, although it is now acknowledged that this was due to lack of preparation, as there were no trained operators to support the children in using the device. According to the senior management of the ministry, the intention is there to revive this project. In a recent development, the ministry has created a new IT Division, separate from Corporate Services. This acknowledges the significance of IT in contributing towards the ministry's core business.

ADB–World Bank–MCIT Project for Fibre-Optic Connectivity

A new submarine cable system (fibre-optic) project has been confirmed; it is expected to be implemented in 2016 and become operational at the start of 2017. This fibre-optic cable will connect Samoa (Upolu and Savaii) to Fiji (Suva). It will provide fast and affordable Internet connectivity and

⁷⁵ <http://www.savalinews.com/2011/05/25/41-schools-log-on-to-csl%E2%80%99s-e-rate-programme/>

⁷⁶ Personal communication with CSL officials, September 2015.

will assist the existing fibre-optic set-up using the American Samoa–Samoa–Hawaii (ASH) cable, which does not provide sufficient capacity. An environmental impact statement has been completed for the ADB–World Bank–MCIT project, and funding negotiations have recently been confirmed, as described in Chapter 1. An interview with the Honourable Minister confirmed that all of the funding was provided through grants.

Pacific Rural Internet Connectivity System (PacRICS)

The PacRICS initiative aims to address some of the major telecommunication challenges facing rural and remote communities in the Pacific Islands region, including:

- the lack of access to communications technology for rural and remote areas;
- the high costs of ICT and access to ICT; and
- the digital divide affecting mostly rural and remote areas.

The PacRICS system was set up and configured by MCIT engineers and was first tested at Mulinuu before it was deployed to Vaipouli College in 2009, where airtime was sponsored by PACTEL for 12 months. This unit was to provide Internet access for the nearby OLPC project. To date, there is one other PacRICS unit, deployed at Saleapaga Primary School, where Internet access is provided for a special needs school to receive updates for students with cochlear implants.

The Rural Connectivity Programme includes telecentres (Fesoota’i Centres) established by the MCIT in 2006, then handed over to local committees to manage. Twelve telecentres were set up in rural areas on Upolu (seven), Savaii (four) and Manono island (one), to provide basic computing and communication facilities. Communications services included telephone, fax and the Internet. The last was an ambitious aim, given the real issues of costs that ultimately presented great challenges to the groups managing the centres. This project was in pre-SchoolNet days and reportedly was used by school children as well as other community members. To date, nine of the original centres are still operating but are beset with hardware issues, given the age of their equipment.⁷⁷

Prospects and Challenges for TEL

Prospects

There are real benefits for learning once the appropriate technology is in place and aligned with the required infrastructure. Thus, the imminent implementation of the new submarine fibre-optic cable promises greatly increased Internet access.

- For all levels, once curricula have been developed and infrastructure is in place, TEL will encourage students to explore and interact.
- The SchoolNet project has improved learning, although more teacher training is still needed to fully utilise its potential.
- Should OLPC be revived, we can anticipate the prospect of reaching more children and starting early by using eLearning.
- Policies that open up competition amongst ISPs have the potential to increase the number of people accessing the Internet, by reducing the costs to individual users and to institutions.
- The addition of a new ISP to the market will increase the number of service providers and should reduce costs even further.

Challenges

The resource intensiveness and dynamic nature of ICT lead to critical problems of sustainability and maintenance for SchoolNet. Thus:

- Extensive integration of ICT into schools is challenged by hardware costs.

⁷⁷ <http://www.mcit.gov.ws/ICT4DevelopmentProjects/RuralConnectivityProgram/tabid/48/Default.aspx>

- Integrating ICT into general education impacts on curriculum development and delivery, the pedagogical practices of teachers and the learning needs of students, as well as the provision of equipment and other support facilities in schools.
- In teacher training, new technologies have introduced new ways of teaching, so ongoing refresher training for teachers is required.
- New teaching approaches and methodologies in ICT go beyond computers, and incorporating new communication technologies and multimedia for learning presents further challenges.
- The dynamic nature of technology has also meant that there is a need to regularly upgrade and revise curricula content and teacher training to avoid obsolescence. This requires substantial financial resources.
- As experienced at the Fesoota'i centres, hardware replacement is a real challenge. This is related to management practices that should be in place to ensure regular upgrades of equipment.
- To date, a further significant challenge is in the cost of Internet access. However, this will change with the completion of the fibre-optic cable that will finally provide affordable broadband connectivity to both Upolu and Savaii.

Solomon Islands

Introduction

With a total land area of 30,407 km², Solomon Islands is one of the largest Melanesian Pacific Island countries, made up of many large volcanic islands lying east of Papua New Guinea. Many outer islands are coral atolls. The largest cities by population are: Honiara (the capital, in Guadalcanal Province), Auki (Malaita Province), Gizo (Western Province), Buala (Isabel Province), Tulagi (Central Province) and Kirakira (Makira/Ulawa Province).

In 1893, the British established a protectorate over Solomon Islands. In 1942, the country was seized by the Japanese during a period of fierce fighting (in World War II). In 1976, Solomon Islands became self-governing, achieving independence from the UK in 1978.

The population in 2014 was estimated to be 609,883; the 2009 national census had counted 571,870. The population of Honiara was 64,609 in 2012, at which time 85 per cent of the remaining population lived in rural areas.⁷⁸ The people are predominantly Melanesian (95.3 per cent), with some Polynesian (3.1 per cent), Micronesian (1.2 per cent) and others (0.3 per cent).

The primary language is Melanesian pidgin (in much of the country, this is the lingua franca), but there are 97 different languages and dialects in total. Although English is the country's official language, only one to two per cent speak it.

Solomon Islands has a young population, approximately 60 per cent of whom are under the age of 25 and 50 per cent are under 20.⁷⁹ Population growth is very high by international standards, at 2.3 per cent (Solomon Islands National Statistics Office, 2011), and projections have estimated a population of around 610,000 by 2015.

National ICT and ICT in Education Policies, Strategies and Programmes

Prior to 2012, the World Bank Solomon Islands Telecommunications and ICT Development Project (SITAICDP, P113148)⁸⁰ was in place and aimed to facilitate increased access to a wide variety of reliable and affordable telecommunications services for the majority of the Solomon Islands population, through efficient and well-regulated competition. It was expected to support the development of a new regulatory institution – the Telecommunications Commission – designed to promote good governance in the sector. Further, through support for enabling infrastructure, the project aimed to pave the way for more widespread application of ICT in supporting economic and social development, including greater opportunities for women. Other development partners assisting in the project included the ADB, Regional Assistance to Solomon Islands (RAMSI), and the Solomons Oceanic Cable Company.

According to Lomo (2012), planned infrastructure developments in the telecommunication sector in 2012 included:

- a submarine fibre-optic cable – scheduled to be connected by 2017;
- the rollout of fifty new rural GSM sites by Solomon Telekom Company in 2012;

⁷⁸http://www.spc.int/sdd/index.php/en/downloads/cat_view/28-pacific-data/104-populations-a-demographic-indicators_SI

⁷⁹ Secretariat of the Pacific Community: National Minimum Development Indicators and Statistics for Development Division, available at <http://www.spc.int/nmd/MdiHome.aspx> and <http://www.spc.int/sdd/>

⁸⁰ http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/SDN/2014/07/08/090224b08256a95c/1_0/Rendered/PDF/Solomon0Island0Report000Sequence006.pdf and <http://www.adb.org/sites/default/files/linked-documents/44382-022-sol-dc.pdf>

- the rollout of O3B by Solomon Telekom Company in 2014;
- a Telekom target of 100 rural GSM sites by 2013;
- a Be-mobile/Vodafone rollout of new rural microwave links in 2012; and
- a Be-mobile/Vodafone rollout of new rural GSM sites in 2013. (Lomo, 2012)

Regarding ICT policies, in 2013, the then Ministry of Communications and Aviation in collaboration with the ITU held a consultation workshop in Honiara on the development of the Solomon Islands ICT Policy and Strategic Plan, as part of the ministry’s ongoing efforts to embrace ICT as a key tool for socio-economic development, with the ultimate goal of improving the livelihood of Solomon Islanders. The workshop was to offer key stakeholders in the country an opportunity to discuss and provide input into the Draft National ICT Policy and Strategic Plan. The workshop examined and discussed the draft plan with respect to high-priority development needs and how ICT could be applied in the country’s key development sectors.⁸¹

At the time of writing (June 2015), the draft of the national ICT policy and a draft national broadcasting policy had been handed over to the prime minister for consideration and possible endorsement. The draft policies were presented by Dr. Andrew Simpson, a consultant engaged as ICT Policy Technical Advisor to assist the Ministry of Communications, Aviation and Information Technology in addressing the gaps in the policy and legal frameworks for broadcasting and ICT. It was noted that “with the benefits of input from the information and communication industry, church groups and members of the public, a national ICT policy document and proposed supportive legislative reforms, as well as a proposed national broadcasting policy and also set of proposed legislative reforms have been developed.” Further, the “proposed policies identify strategies aimed at achieving a peaceful, united and progressive Solomon Islands that communicates and is informed by ICT technologies open to all and a Solomon Islands that participates, enjoys and learns from broadcasting that is accessible to all” (PMO Press Secretariat, 2015).⁸²

ICT Access and Use

The following data from the Commonwealth Telecommunications Organisation reveals that the decline in fixed telephones corresponded to a tripling of mobile subscriptions between 2010 and 2012. Internet usage was very low.

Table 8. Penetration rates 2010–2012⁸³

Indicator	2010	2011	2012
Fixed telephone subscriptions (M)	8,400	8,391	8,060
Fixed telephone subscriptions per 100 inhabitants	1.56	1.52	1.42
Mobile cellular telephone subscriptions	115,500	274,872	302,147
Mobile cellular telephone subscriptions per 100 inhabitants	21.46	49.77	53.34
Estimated Internet users per 100 inhabitants	5.00	6.00	7.00

Education

The Solomon Islands prime minister has frequently reaffirmed his view that education remains a strong government priority and a key platform for the next generation of the country’s workers and leaders.

The Solomon Islands Government (SIG) contributes a substantial portion of its budget to education (over 27 per cent). This provision includes significant support from international donors, in particular Australia. The SIG as part of the education budget provides support for tertiary education, a major

⁸¹ <http://www.solomontimes.com/news/discussions-begin-on-ict-policy/7884Aug2013>

⁸² <http://www.solomonstarnews.com/news/national/7276-draft-broadcasting-policies-with-pm>

⁸³ <http://www.cto.int/media/ICT-data/Solomon%20Islands.pdf>

component being tertiary scholarships for Solomon Islanders to study overseas, many of whom attend USP.⁸⁴

The Australian Government proposed a 10-year investment plan to support skills for economic growth in Solomon Islands (Schofield, 2012). Subsequently, the Skills for Economic Growth programme was developed, with the stated goal of strengthening the capacity of tertiary education and training in Solomon Islands. The desired outcome was to “produce quality graduates who are in demand in the labour market, and who have the skills and knowledge needed to increase national productivity and competitiveness” (Schofield, 2012).

Four objectives were identified in the Skills for Economic Growth programme:

1. To improve the quality and labour market relevance of post-school education and training in Solomon Islands.
2. To increase the equitable access of young Solomon Islanders, male and female, rural and urban, and especially the poor and people with a disability, to quality-assured, post-school education and training opportunities.
3. To facilitate the emergence of an integrated network of quality-assured post-school institutions in Solomon Islands that provide good learning pathways and career options for young Solomon Islands women and men from school to work and further study.
4. To increase the financial sustainability of the Solomon Islands post-school education and training system.

Consistent with this, as noted in the SIG’s Medium Term Development Plan, the government’s development objectives are to:

1. alleviate poverty and provide greater benefits and opportunities to improve the lives of Solomon Islanders in a peaceful and stable society;
2. provide support to the vulnerable;
3. ensure that all Solomon Islanders have access to quality education and that the country can adequately and sustainably meet its manpower needs; and
4. increase the rate of economic growth and equitably distribute the benefits of employment and higher incomes amongst all the provinces and people of Solomon Islands.

As part of the SIG education reforms, the Solomon Islands Education Act 1978 has undergone a review, and a new act was proposed in a government white paper that seeks to guide the development of education and the SIG investment in education for the nation. The white paper noted that the country is unusual in terms of its demographics (e.g., the age distribution) and is facing rapid societal change. The new act proposes an education system that is inclusive and more cost-effective, maximising the SIG’s return from its investment in tertiary education. The SIG has also signalled that it wants tertiary education which is consistent with the themes identified in the National Education Action Plan (NEAP 2013–2015), with emphases on TVET, inclusive education and quality of provision.

The Solomon Islands education system is currently undergoing a major reform and restructuring in response to the needs identified through the development of the Education Sector Investment and Reform Programme and the Education Strategic Plan. Although the Ministry of Education and Human Resource Development (MEHRD) accounts for approximately 27 per cent of total government expenditure, the gross enrolment at secondary school is below 50 per cent, and upper-secondary enrolment is only 30 per cent. The costs of secondary school fees, transportation, school uniforms and textbooks, along with a lack of qualified teachers, a shortage of teaching materials, poor facilities and high competition, represent significant barriers to secondary education. Another education issue is poor competency in the English language – the language of instruction in schools – and the general lack of literacy (Curtain, 2013). This has major implications for tertiary-level study conducted in English.

⁸⁴ Ibid.

The SIG is thus placing considerable focus on education reform, including in the tertiary sector. There have been a number of reform initiatives and high-level meetings, such as the Tertiary Education Think Tank (Honiara, February 2015) and the Teacher Education Conference (July 2015).

NEAP 2013–2015 proposes three strategic goals:

- Achieving equitable access to education for all people in Solomon Islands.
- Improving the quality of education in Solomon Islands.
- Managing and monitoring resources efficiently and effectively.

The MEHRD's vision statement declares:

Our vision is that all Solomon Islanders will develop as individuals and possess knowledge, skills and attitudes needed to earn a living and to live in harmony with others and their environment. We envisage a united and progressive society in which all can live in peace and harmony with fair and equitable opportunities for a better life. We envision an education and training system responsive to its clients and efficiently managed by its stakeholders and clients. We wish to deliver quality education for everyone in Solomon Islands. (Solomon Islands Government, 2014)

The three levels of schools (early childhood, primary, secondary) are now in separate divisions:

- Early childhood education (ECE) previously functioned under the Primary Education division, but after a new ECE policy was approved, it became a new division within the MEHRD. The Early Childhood Education Division is responsible for children aged three to five.⁸⁵
- The Primary Education Division is responsible for the administration of the act, the constitution and other statutory requirements in respect of all registered primary schools and of kindergartens where these are separate from primary schools. In particular, the division is responsible for all aspects of primary schools.⁸⁶
- Secondary Education Division: With the sector-wide approach undertaken by the MEHRD and its development partners, the Secondary Division's objectives have been clearly outlined. There are underlying issues of human resources and capacity, which requires changes at all levels. This includes a need for a refocus, revitalisation and renewal in the attitudes, behaviours and characters of personnel and colleagues. In this regard, the identified areas have been noted and divided into two parts to achieve better results.⁸⁷

Beyond the school level, the Teacher Training and Development Office contributes to improving accessibility, management and the quality of education, through training and developing quality teachers, who in themselves are central to an effective education system. It is projected that 20 teachers will be trained in ICT in the next five years.⁸⁸

The TVET Division aims to mainstream TVET as a vehicle for empowering Solomon Islanders – especially youths – to achieve sustainable livelihoods, and consequently for developing the nation socio-economically. The overall goal of the division is to promote skills acquisition through competency-based training with proficiency testing, so that individuals can achieve empowerment and sustainable livelihoods and be responsible citizens.⁸⁹

Five universities operate in the country:

1. Solomon Islands National University (SINU)
2. The University of the South Pacific (USP)

⁸⁵ <http://www.mehrd.gov.sb/professional/ece>

⁸⁶ <http://www.mehrd.gov.sb/professional/primary>

⁸⁷ <http://www.mehrd.gov.sb/professional/secondary>

⁸⁸ <http://www.mehrd.gov.sb/tertiary-technical/teacher-training-division>

⁸⁹ <http://www.mehrd.gov.sb/tertiary-technical/tvet>

3. John Coleridge Patterson University (JCPU)
4. The University of Papua New Guinea Open Campus (UPNGOC)
5. The University of Goroka Open Campus

Solomon Island National University⁹⁰

SINU offers tertiary academic programmes and TVET. There is a distance and flexible learning school-based programme that focuses on developing professional competence and robust subject knowledge, offered through a variety of media, including print, audio and contact with local mentors. Radio is used for information dissemination to the teachers and their mentors and to offer guidance in professional studies. Schools are selected on a cluster basis in consultation with the provincial education authorities. All eligible teachers in the selected schools are offered a place on the programme. This, coupled with the involvement of the head teacher and supportive radio broadcasts, promotes a whole-school approach which may have additional benefits to the school. More experienced and qualified teachers in the school are encouraged to assist and support the trainees and invited to participate in programme activities.⁹¹

The university's ICT Department (ICTD) is responsible for the planning, design, installation, operations and maintenance of all ICT services and infrastructures, which include communication systems and works, and students' computer laboratories. Through three divisions, ICTD supports the installation and maintenance of servers, cable networks, network switches, Wi-Fi services, repairs and maintenance of desktop and laptop PCs, printers, email applications, software updates and any other user-related operational and technical issues. It also operates and maintains the SINU website and operates the university's internal telephone switchboard services.

The University of the South Pacific⁹²

USP teaches programmes from pre-tertiary – College of Foundation Studies (CFS) – to post-graduate levels. Whilst the main USP campus is located in Suva, Fiji, the USP Solomon Island campus offers all university programmes, including those on various aspects of IT, either by distance modes or face-to-face, according to demand. Hence, all programmes are accessible. This is due to the university well-developed ICT (see also the section below on "Major Initiatives"). Support includes IT services, and the computer labs are fully utilised. Ministry records indicate that in 2014–2015, 32 students enrolled in two media and computer courses.

John Coleridge Patterson University

JCPU, operated by the Anglican Church of Melanesia, in 2015 began offering courses in Second Chance Education and Theological Education in Distance. Second Chance Education will be offered to students who have completed the Solomon Islands Form 3 and 5 National Examinations Certificates. The Theological Education in Distance will be offered to Anglicans and members of other sister churches in the country. Both certificate and diploma courses will be available.⁹³

The University of Papua New Guinea Open College Campus

UPNGOC provides administrative support to UPNG schools to offer their academic programmes through distance modes. It facilitates the delivery of both sub-degree and undergraduate programmes through ODL. This unit was established in 2002 by converting the former Institute of Distance and Continuing Education into the Open College, thereby enabling UPNG to become a dual-mode university. The structural and administrative setup of UPNGOC is three-fold; (1) Programme Development and Production, (2) Centre and Student Support and (3) Professional and Continuing

⁹⁰ <http://www.sinu.edu.sb/>

⁹¹ <http://www.sinu.edu.sb/dfl.html>

⁹² <http://www.usp.ac.fj/>

⁹³ <http://www.acom.org.sb/ministries/education/john-coleridge-patterson-university>

Education. A network of study centres is established throughout PNG and in Solomon Islands to deliver all ODL-based programmes.⁹⁴

The University of Goroka Open Campus⁹⁵

Opened in May 2014, the Open Campus enables Solomon Islanders to access The University of Goroka's (UOG) degree programme in school management through flexible and open learning, after the establishment of a UOG centre in Honiara. At the opening, UOG Vice Chancellor, Dr. Gairo Onagi, said the university was present in Solomon Islands not to provide competition but as a partner to make education accessible.

Major Initiatives

USP Initiatives (USPNet and mLearning strategies)

As described already, the USP offers courses online in a range of subject areas for all levels: pre-degree, vocational, undergraduate and post-graduate. Hence, the USP Solomon Island Campus, like other USP campuses, provides opportunities for using technology to access learning through the USPNet satellite network for distance and flexible learning in formal and vocational programmes. Through this, students have unlimited Internet access to use the university's Moodle platform to interact with lecturers, tutors and students at other campuses, and to access library databases and email. mLearning support activities have recently been made available to USP students at all 14 campuses (trialled first at the Laucala campus in 2012 in Suva). This initiative involves the use of tablets, iPads and SMS messaging from the Faculty of Science, Technology and the Environment, in the drive to keep in touch and encourage students to continue (and not drop out). As well, several campuses including USP Solomon Islands have proceeded to provide wireless access for students; this helps where there are insufficient PCs to support the enrolled numbers.

SINU Teacher Training by Distance Education

The distance education teacher training programme, using print and radio (described earlier), is making an impact on the production of trained teachers, particularly in rural areas. This initiative is:

- school-based and focuses on developing professional competence and robust subject knowledge;
- offered through a variety of media, including print, audio and contact with local mentors;
- delivered through radio (information dissemination) to the teachers (the learners) and their mentors and to offer guidance in professional studies;
- supported by mentors (head teachers and a master teacher), offering professional support to the learners as they work with their study materials. Master teachers assist clusters of approximately 15–20 teachers in training, visiting each trainee once per term to support initial self-appraisal, observe teaching, carry out formative assessment, give supportive feedback and assist SINU with final assessments;
- co-ordinated through clusters of schools selected by their respective provincial education authorities. All eligible teachers in the selected schools are offered a place on the programme.

Together with the involvement of the head teacher and supportive radio broadcasts, this also promotes a whole-school approach, which may have additional benefits for the school. In addition, more experienced and qualified teachers in the school are encouraged to assist and support the trainees and are invited to participate in programme activities.

People First Network (PFNet)

The UNESCO Metasurvey (2003) described this basic communications initiative in detail and the positive effect it had in rural areas. The UNESCO report also alluded to an ongoing USP study into the

⁹⁴ <http://www.upng.ac.pg/index.php/open-college>

⁹⁵ <http://edunewspng.com/2014/05/uog-opens-center-in-the-solomon-islands/>

impact of the initiative. That study concluded: “the results show that PFNet has reduced the digital divide via increased communication between Solomon Islanders people living in rural and urban areas.”⁹⁶ There is also a possibility that the project could be revitalised with some standard equipment and training at a modest cost of USD 6,000, “to enable sites to join the PFNet for regular email connectivity” (Solomon Islands Rural Link, 2015).

OLPC in Solomon Islands⁹⁷

Solomon Islands was the first site (2008) in the Pacific region to have a substantial OLPC programme in remote schools. At the time, many of the country’s islands were served by nine VSAT⁹⁸ satellite dishes on sites known as Distance Learning Centres. These had been established using EU funding and were administered by the MEHRD in the Distance Learning Centres Project. The Solomon Islands OLPC pilot sites, located at Bekabeka, Patukae and Batuna primary schools on Gatokae island in the Western Province, had access to EU VSAT satellites and another VSAT satellite of the SPC PacRICS programme.

As part of the trials with 75 gifted XO-1s, the whole of Year 1 was saturated in Batuna and Patukae primary schools, with Bekabeka to follow. By March 2009, the three trials schools were saturated with the addition of 300 laptops. In 2010, an independent evaluation of the OLPC initiative was undertaken by the Australian Council of Education Research (ACER).⁹⁹ Whilst the ACER report revealed positive outcomes of the project, at the time of writing, no further information is available on OLPCs in the country.

The Pacific Rural Internet Connectivity System (PacRICS)

With technical assistance from SPC, the SIG implemented in 2011 Phase 1 of the Solomon Islands Government Rural Internet Project (SOLGRIP). Key features of this e-government project¹⁰⁰ are as follows:

- The provision of broadband communications and ICT capacity building to 21 provincial government centres, 54 government offices and 300 government workers.
- Five ministries shared the costs and benefits to strengthen and improve government services.
- Based on the government-approved Phase 1 plan, 17 rural hospitals and health centres were also to be provided with satellite broadband Internet services through PacRICS, thus bringing internet access to provincial hospitals and rural health centres in selected sites.
- SOLGRIP/PacRICS was supplemented by the Provincial Governance Strengthening Programme of the UNDP, whereby five of the 17 rural centres were provided with satellite broadband Internet access. These five were the first sites where the telecommunication system devices were installed.
- Funded by the SIDS DOCK support programme and Denmark, this project was carried out as part of the Pacific Island Greenhouse Gas Abatement through Renewable Energy Project, “PIGGAREP Plus,” by the Energy Division of the Ministry of Mines, Energy and Rural Electrification.
- The project involved the “provision of [a] renewable energy-based power supply (solar PV) to existing telecommunication (VSAT) systems at Provincial Government offices in Tulagi, Buala, Gizo, Kirakira, Taro, Tingoa, and Lata.”
- Implementation was supported by SPREP.

⁹⁶ http://www.usp.ac.fj/jica/ict_research/documents/pdf_files/pfnet_report.pdf

⁹⁷ http://wiki.laptop.org/go/OLPC_Solomon_Islands#Evaluation_Report_by_ACER_available_April_2010

⁹⁸ https://en.wikipedia.org/wiki/Very-small-aperture_terminal

⁹⁹ http://wiki.laptop.org/go/OLPC_Solomon_Islands;

<http://wiki.laptop.org/images/0/0b/SolomonIslandsOLPCTrialsEvaluationByACER2010.pdf>

¹⁰⁰ [http://www.businessadvantagepng.com/announcements/works-tender-solomon-islands-solar-pv-telecommunication;](http://www.businessadvantagepng.com/announcements/works-tender-solomon-islands-solar-pv-telecommunication) <http://www.solomontimes.com/news/rural-internet-connectivity-programme-for-solomon-islands/5829>

- Expected outcomes:
 1. reduced reliance on fossil fuels to operate telecommunication systems in rural centres
 2. reduced operational costs (particularly energy) for telecommunication systems equipment

Prospects and Challenges for TEL¹⁰¹

Prospects

- ICT policy adoption and establishment, including major reform in broadcasting legislation
- universal fund adoption and establishment
- people will have equitable access to telecommunication services, as well as choices of reliable, efficient and affordable services
- capacity building and skill enhancement by the universities (e.g., USP, SINU) through distance education enabled by appropriate technology
- national MEHRD inclusive education priorities and deliverable targets aimed at reaching the rural and disadvantaged population
- the current strong relationships with donor partners have brought much-needed assistance, so maintaining and strengthening these relationships will bring further critically needed support to the national plans

Challenges

- cost and availability of remote power supplies
- remoteness of locations and sparse distribution of the local populations
- cost of computer hardware and accessories
- availability and sustainability of suitable technology and associated costs
- skill availability and the competency levels of facilitators in education initiatives
- limitations in satellite bandwidth, along with bandwidth costs
- land issues
- security, spam and cybercrime issues

¹⁰¹ Source: Lomo (2012).

Tonga

Introduction

Tonga, an archipelago in the South Pacific Ocean south of Samoa, also known as the Friendly Islands, comprises 176 islands, of which 36 are inhabited. There are four island groups, including the mostly low-lying Tongatapu group, the volcanic and coral Ha'apai group, the flat coral islands of the Vava'u group, and the volcanic Niuaus group in the far north. The total area is 748 km².

Tonga has been a constitutional monarchy since 1875. Tonga acquired its independence from the UK in 1970. Tongatapu island is the seat of parliament and the location of the capital, Nuku'alofa, and has the main commercial centre.

The population at the last census (2011) was 103,252,¹⁰² whilst the official estimate for 2015 is 103,335; the gender ratio is 1:1. The people are predominantly Polynesian and speak Tonga and English. The population density is 139.04/km². Almost two-thirds of Tonga's population lives on Tongatapu.

Tonga is a member of the Commonwealth (from 1970), the Pacific Island Forum Secretariat, the Secretariat of the Pacific Community, the University of the South Pacific, and other regional and international organisations.

National ICT Infrastructure and Services

Telecommunications Services

Tonga has enjoyed a telecommunications infrastructure for many years. In 2003, there were two telecommunication organisations: Tonga Communications Corporation (TCC) and Shoreline Communications (Tonfön). TCC operated both landlines and wireless (U-Call), with 4,000 subscribers in April 2003. Also in 2003, the local ISP was under TCC, covering mainly Tongatapu, with approximately 1,500 dial-up subscribers. Tonfön's mobile service currently has over 10,000 subscribers.

In June 2013, a project to provide a high-speed broadband Internet connection to Tonga completed its first major stage when the Tonga end of an 826-kilometre underwater fibre-optic cable link from Fiji came ashore. This new cable was expected to provide a high-speed connection and help reduce the costs of high-speed Internet, making Internet access cheaper for individuals, businesses and especially education.

National Policy Documents include: National ICT Policy; Communications Policy; Communications Act; E-Education Skill Development and Entrepreneurship Policy documents; and the Tonga Government's Strategic Development Plan 2001–2004 and Strategic Development Plan 9 2009–2013.

Despite Tonga having had Internet access for some time, there was no evident national ICT policy in place in 2003 for education or other purposes. However, the Tonga Government Strategic Plan 2001–2004 included:

- the development of an ICT curriculum for secondary and tertiary levels (although a planned pilot for primary schools did not proceed due to lack of funding);
- computer training programmes – also planned but not implemented (again for lack of funding); and
- an ICT strategic plan, which was implemented through AusAID funding.

In recognising the vital role of ICT in terms of national development and as a key enabler to achieving national development goals, the government has developed specific strategies and plans that incorporate ICT into Tonga's national development efforts, culminating in the endorsement of the National ICT Policy.

¹⁰² http://www.spc.int/prism/tonga/index.php?option=com_content&view=featured&Itemid=167

The policy outlines the national ICT vision and the key objectives that are to be achieved through effective use of ICT, including the development of new skills and jobs that will enable Tonga and Tongans to participate in and benefit from the global networked economy.

ICT Access and Use

In 2003, there was very little access and usage for primary schools. At the secondary school level, there was some access, whilst vocational programmes at the government-owned Community Development Centre did have some access, and Tupou Tertiary Institute School had a diploma programme in affiliation with a New Zealand tertiary education provider. However, usage was limited. The Tonga Institute of Education provided computer access for its students.

As a result of innovative ICT initiatives, such as the PacRICS and OLPC projects, the SPC provided resources to support Tongan priorities in a number of key sectors.

Table 9. Indicators of ICT infrastructure and access

Indicator	2010	2011	2012
Fixed telephone subscriptions (M)	31,000	30,000	30,000
Fixed telephone subscriptions per 100 inhabitants	29.79	28.71	28.60
Mobile cellular telephone subscriptions	54,300	55,000	56,000
Mobile cellular telephone subscriptions per 100 inhabitants	52.18	52.63	53.39
Estimated Internet users per 100 inhabitants	16.00	25.00	34.86

Source: Commonwealth Telecommunications Organisation

Status of Internet Access¹⁰³

Despite the availability of the infrastructure, less than one per cent of the population is connected, whilst the remainder have heard of the Web but have never seen it. A phone call or letter will very likely reach someone more quickly than trying an email. Full Internet access is in practical terms only available in Tongatapu. The outer islands have no feasible Internet access, and other telephony services (facsimile, voice) can be limited.

Education

Tonga's public spending on education accounts for approximately five per cent of GDP.¹⁰⁴ Literacy amongst people aged 15–24 is 99.4 per cent (2011). Notably, Tonga has one of the world's highest concentrations of PhDs per capita.¹⁰⁵

The Ministry of Education and Training (MOET) oversees the education system. The Education Act of 1974 enabled the ministry to set aims, syllabi, examinations and teaching methods. The main components of education administration are the Curriculum Development Unit and the Examination Unit.

More than 100 primary and secondary schools provide compulsory education through to the end of high school.¹⁰⁶ Primary school comprises six years and secondary six, with cycles of four and two years. More than 95 per cent of primary students attend state schools, whilst about 90 per cent of secondary students attend church schools. As of 2005, some 90 per cent of pupils completed primary school. The school year starts in February.

¹⁰³ <http://www.tongatapu.net.to/tonga/telecom/default.htm>

¹⁰⁴ <http://www.cedol.org/pacific/tonga/>

¹⁰⁵ <http://www.radioaustralia.net.au/international/radio/program/pacific-beat/unhappiness-in-tonga-over-education-reforms/1232536>

¹⁰⁶ https://en.wikipedia.org/wiki/Education_in_Tonga

Vision, Mission and Framework for Education

Tonga's vision for education is: "The people of Tonga will achieve excellence in education that is unique to Tonga." The mission of the education sector is: "To provide equitable, accessible, relevant, and sustainable quality education for all Tongans that will enable Tonga to develop and become a learning and knowledge society" (Government of Tonga, 2004).

Thus, over the last ten years, Tonga has embarked on an ambitious educational reform programme, which began with the development of a series of planning documents:

- Tonga Education Sector Study (2003)
- Strategic Plan for Education in Tonga (2003–2013)
- Tonga Education Policy Framework (2004–2019)

All of these were aligned to Tonga's Strategic Development Plan 8 (2006–2010), the Pacific Education Development Framework (2009–2015), the Education for All Goals, and the Millennium Development Goals.

The education development programme that emerged from these documents was the Tonga Education Support Programme (TESP). The main goals of TESP I were to improve:

- equitable access to and quality of universal basic education up to Year 8;
- access to and quality of post-basic education; and
- the administration of education and training.

The ministry developed a new Tonga Education Lakalaka 1 Policy Framework (2013–2017), which has become TESP II. Australia has donated AUD 10.5 million and New Zealand NZD 9 million to fund TESP II for the next three years. TESP II focuses on three key policy areas:

- Students' outcomes at all levels, especially in literacy and numeracy, in the early years of basic education
- Teachers' competencies at all levels, which include both pre-service and in-service professional development
- Teaching and learning environments, which include teaching and learning resources, equipment and physical facilities

From these programmes and activities, the ministry expects to achieve at least 99 per cent access, participation, retention and completion at the UBE level. The aim is that all students at the end of Form 7 or Year 15 of compulsory education (ages four to 18) will have achieved the minimal requirements for the core attributes of the Tongan school leaver, and that they will leave school with some meaningful qualifications.

As with all reforms and plans, they are only as good as the capabilities of those who implement them. The Lakalaka Policy Framework is simply a tool to guide the ministry in performing its core functions and responsibilities. The ministry, in theorising about education, its vision and mission, processes and outcomes, uses the Lakalaka Framework to aid it in these exercises. The framework sets the context in which education occurs, the purposes for which it is performed, the processes that are used, the performers, the resources they need and the operational matters that must be considered to achieve excellence, which will generate *mafana* and *malie*, the transforming qualities of education that can leave a legacy of excellence. The Lakalaka is a symbol of excellence, and this is the vision for education in Tonga.¹⁰⁷

¹⁰⁷ The Lakalaka is one of Tonga's major art forms, consisting of poetry that is sung and accompanied by dance. Its importance and uniqueness was recognised by UNESCO in 2003 when the Tongan Lakalaka was declared a "Masterpiece of the Oral and Intangible Heritage of Humanity." It is the only Pacific performing art that has been recognised as a masterpiece.

School Education¹⁰⁸

The education system in Tonga is organised around four basic levels: non-compulsory early childhood education for children aged three to five, primary education for ages six to 11 (Classes 1–6), secondary education (ages 12–18) and post-secondary education (ages 18 and over). All children between six and 14 are legally required to attend school until at least six years of education have been completed. Primary education is free.

There is a widespread belief that Tongan education is in decline. This is being attributed to the loss of qualified and experienced teachers to out-migration – driven by the higher wages available overseas – resulting in a concern that the quality of teaching is falling, particular in teacher training. However, there are signs of some progress in terms of the development of physical infrastructure and technological capacity.

There is also concern that secondary education is too narrowly focused and is not paying adequate attention to skills training necessary to meet the needs of the local economy.

Pre-Primary Level

Pre-primary education is provided in the form of dozens of private kindergartens and early childhood centres managed by community organisations, NGOs and religious bodies across the kingdom.

Primary Level

Primary education is compulsory and free for nine years of education between ages six and 14, based on the 1974 Education Act. Most (99 per cent) of primary schools are state-owned.

Secondary Level

About 44 per cent of secondary schools are state-owned. Churches and private organisations provide complementary services within the education sector. Tonga High School was established in 1947 and aims to achieve a level of education equivalent to that offered in neighbouring countries such as New Zealand and Australia. Tupou College, established in 1866, is a Methodist boys' secondary boarding school on the island of Tongatapu and has about 1,000 pupils. The Ocean of Light International School is a Bahá'í school. In 2009, there were eight government secondary schools and one government middle school.

Non-Government Schools

Non-government schools are major education providers. The current number of private secondary schools is unknown, but these substantially outnumber the government-run institutions. The Free Wesleyan Church plays a key role in Tongan education and runs six colleges as part of its independent schools network. The church has an Education Office, responsible for the interschool allocation of staff and resources, as well as in-service training, curriculum development and staff evaluation. Other major education providers are the Roman Catholic Church, the Seventh-Day Adventist Church and the Church of Jesus Christ of Latter Day Saints. These faiths have their own school agencies to co-ordinate the provision of education. As mentioned above, the Bahá'í faith runs the Ocean of Light International School outside Nuku'alofa. The school provides classes from kindergarten (from age three) to the International General Certificate of Secondary Education (IGCSE) level (ages 14 to 16). Education at the Ocean of Light School is based on the Cambridge International Examinations curriculum.

¹⁰⁸ http://www.icde.org/projects/regulatory_frameworks_for_distance_education/country_profiles/tonga/education_system/

Technical and Vocational Education and Training¹⁰⁹

Most vocational education is pursued overseas, but Tonga has some teacher training, nursing and medical training, a small private university, a women's business college and a number of private agricultural schools.

The 'Unuaki-'o-Tonga Royal University of Technology provides a range of courses in the TVET field. These include associate degrees in accounting and a number of medical fields. The Royal University also offers diploma-level programmes in the fields of (i) automotive and vehicle technology, (ii) electro-technology and electrical engineering, (iii) architecture/drafting and (iv) handicrafts and carving.

The Queen Salote School of Nursing (QSSN) trains nurses for work in hospitals and health centres, both government and private. The QSSN is administered by the Tonga Ministry of Health.

The Sia'atoutai Theological College (STC) was established by the Free Wesleyan Church of Tonga to provide training to lay and ordained ministers. The STC now provides theological training to personnel from a range of Protestant denominations (such as the Church of Tonga and the Anglican Church). Courses on offer include: (i) a Certificate in Theology and Pastoral Ministry; (ii) a Certificate in Theology and Pastoral Ministry with Honours; (iii) a Diploma in Theology; (iv) a Bachelor of Divinity; and (iv) a Bachelor of Divinity with Honours. The STC has an annual intake of about 60 students.

The Tonga Health Training Centre is responsible for training health officers, public health inspectors, X-ray assistants, laboratory assistants, district medical officers and dental assistants.

The Tonga Institute of Education (TIOE) is the Tongan government's teacher training college. The TIOE trains teachers for both government and non-government schools. It has programmes leading to the Diploma of Education (Primary), Diploma of Education (Secondary) and Diploma in Early Childhood Education. The TIOE also provides certificate-level programmes and a one-year postgraduate Diploma in Teaching for Graduate Teachers.

The Tonga Institute of Higher Education (TIHE) provides certificates and diplomas in a small range of subjects: (i) accounting and tax, (ii) agriculture, (iii) information technology and computing, and (iv) tourism and hospitality. In addition, the TIHE offers subsidised short courses in IT-related areas. The Community Development and Training Centre at the TIHE also offers certificates and diplomas in (i) accounting, (ii) computing, (iii) information science, and (iv) media and journalism.

The Tonga Maritime Polytechnic Institute (TMPI) trains deckhands, motormen, stewards and cooks for commercial shipping companies. The institute also provides certificate-level training in areas such as general engineering, automotive maintenance, electrical repair and carpentry. In addition, the TMPI offers non-formal maritime training to the owners and crew of smaller vessels.

The Police Training School is run by the Ministry of Police and provides basic training for recruits to the Tongan police force, fire and prison services.

Managed by the Free Wesleyan Church, the Tupou Tertiary Institute (TTI) has four schools: (i) business and management; (ii) architectural and construction technology; (iii) information technology and communication technology; and (iv) teacher education. Students at the TTI can study for the following qualifications: NZIM Certificate in Management; Diploma in Business; Diploma in Construction (Level 5); National Diploma in Architectural Technology (Level 6); Certificate of Information Technology; Bachelor of Information Technology; Certificate in Computing; Certificate in Office Administration; Certificate in Teaching; and Diploma in Teaching. Teaching qualifications are offered only to teachers in Free Wesleyan Church schools.

¹⁰⁹ http://www.icde.org/projects/regulatory_frameworks_for_distance_education/country_profiles/tonga/education_system/

The TTI offers New Zealand-accredited study programmes in association with New Zealand institutions. Courses in business, management and technology are delivered in collaboration with the Whitireia Community Polytechnic. Programmes in architecture and construction are in conjunction with the Wellington Institute of Technology. The teacher education programme is provided with the Bethlehem Tertiary Institute. In addition, the TTI teaches USP foundation courses. The TTI campus is also the site of training academies run by ITU and Cisco.

The Free Wesleyan Church also manages Hango Agricultural College, which offers agricultural training to school leavers and adults. Courses up to diploma level are available in conjunction with Massey University.

The Tonga Defence Force Royal School of Science offers programmes up to a bachelor's level on defence and information technology. In addition, the Tonga Defence Force offers training to service personnel in areas such as construction, electrical and motor mechanics and computer technology.

The Catholic Church has a number of TVET institutions in Tonga, three of which the government subsidises: St. Joseph's Business College, 'Ahopanilolo Technical College and Montfort Technical College (see below). St. Joseph's provides training in the areas of business, typing and secretarial work for school leavers. The college also offers in-service training to public and private sector employees. The 'Ahopanilolo Technical College specialises in training staff, including chefs, for the hospitality and tourism industry. The college also offers training in fashion and design. The Montfort Technical Institute provides training for school leavers in areas such as carpentry, automotive, painting and welding. Although significant in Tongan terms, the Catholic TVET institutions are small-scale operations. In 2008, St. Joseph's had 125 students, 'Ahopanilolo 70 and Montfort 60.

The National Centre for Vocational Studies (NCVS) is administered by the Ministry of Training, Employment, Youth and Sports. The NCVS provides certificate and diploma programmes in tourism and hospitality, agriculture, information technology and international business.

The Tonga Chamber of Commerce and Industry works with foreign aid agencies and other donors to provide in-country training in business skills and entrepreneurship for Tongan business people and their employees. The chamber's new Tonga Business Enterprise Centre will play a major role in this area.

Higher Education

USP Tonga Campus

The main tertiary education provider in Tonga is the University of the South Pacific, in which Tonga is a partner. The Tonga campus is located at 'Atele, in the village of Ha'ateiho, about seven kilometres from the capital. Smaller USP centres are located in the Vava'u and Ha'apai island groups. In 2008, USP enrolments in Tonga were 205 EFTS; this translates to 1,400 students each semester, with a staff of 20, including about 12 tutors. USP Tonga offers a range of programmes – from pre-tertiary preliminary and foundation to vocational certificates and diplomas and degrees (undergraduate and post-graduate) – by distance from lecturers based at the main campus in Suva, Fiji; agriculture programmes are offered from the Alafua campus in Apia, Samoa; and law programmes are delivered from the School of Law based in Port Vila, Vanuatu. The USP also offers certificate-level courses through its continuing education programme. Tonga is part of USPNet, a privately owned satellite system used extensively to support the students studying at a distance, through satellite tutorials and Internet access.

Tonga High Schools Connectivity¹¹⁰

USP and Australia's Academic and Research Network have successfully connected four schools in Tonga as part of their pilot project. This project has allowed these tertiary and high schools to access various services via USPNet. Services include Moodle, REACT, and the Internet, similar to what it are

¹¹⁰ Source: unpublished report to USP Communications, Information, and Technology Committee by USP Director, IT Services, September 23, 2015.

available at the regional USP campuses. This project will run for six months, during which data will be collected for analysis, with a view to seeking donor assistance for further ICT-related education initiatives in the region.

Other higher education institutions are:¹¹¹

- ‘Unuaki-‘o-Tonga Royal University of Technology (mentioned above) offers Bachelor of Science degrees in Nursing and in Business Administration. The highest qualification available is a Master of Business Administration (MBA).
- The private ‘Atenisi Institute runs two educational bodies, ‘Atenisi University and ‘Atenisi Performing Arts Foundation. Atenisi University, established in August 1975, offers two-year study programmes leading to the award of associate diplomas in arts and science, Associate of Arts and Associate of Science, as well as a four-year Bachelor of Arts, a four-year Bachelor of Science, and Master of Arts and Doctor of Philosophy programmes. The Performing Arts Foundation provides training in choral music and dance. In 2008, the university and foundation had a combined student population of about 150.
- YWAM Tonga Campus is a small private university run by the Christian organisation Youth With A Mission International. The Tonga campus runs courses in basic construction techniques, primary healthcare, and discipleship training designed to equip participants for Christian outreach.

Overview of Distance Education¹¹²

Tonga has a long history of distance education (DE) by Pacific standards; the Ministry of Education began broadcasting weekly, radio-based DE programmes as long ago as 1963. However, the main DE provider in Tonga is the University of the South Pacific. The USP Tonga campus was established as an extension centre in 1971. During its early years, the centre was based in the old Vaiola Hospital in Nuku‘alofa. In 1987, the centre relocated to its present site at ‘Atele. Tongan students are able to choose from hundreds of courses at different levels, from certificate-level programmes to post-graduate qualifications available through the USP’s Distance and Flexible Learning programme. Print-based materials are the primary method of distance delivery, supplemented by a range of different media: audio/video tapes, CD-ROMs and DVDs, satellite-based videoconferencing and audio conferencing, and eLearning using the Moodle platform. However, USP’s goal is to move eventually to fully online delivery, and courses are gradually being converted to online versions – significantly, the whole Bachelor of Laws programme is now fully online. The university has also set a target for a proportion of its courses to be online by 2018. These include pre-tertiary through to post-graduate programmes.

The Pacific Open Learning Health Network has two learning centres in Tonga: one at the Queen Salote School of Nursing and another at Vailo Hospital, in Vava‘u. These facilities are used for the delivery courses in nursing, health and medical technology. POHLN provides a wide range of short, self-paced, online courses on health and medical technology, using Moodle. These courses are accessible to all. Registration is necessary only when the student intends to sit for the final exam. Passing the final exam allows the student to save or print a Certificate of Achievement. In addition to its own courses, POHLN provides 90 courses from Lippincott’s NursingCenter range and 50 radiology courses from the Philips Online Learning Centre.

The US Faith Evangelical College provides DE-based tuition to Tongan students through the local Faith Evangelical College.

Higher Education Reforms¹¹³

Reform of higher education in Tonga is largely dependent on the direction of USP policies.

¹¹¹ http://www.icde.org/projects/regulatory_frameworks_for_distance_education/country_profiles/tonga/education_system/

¹¹² Ibid.

¹¹³ http://www.icde.org/projects/regulatory_frameworks_for_distance_education/country_profiles/tonga/education_system/

Future Direction of Tertiary Education

The future direction of tertiary education in the country depends largely on development at the Tonga Campus of the USP.

ICT Initiatives

Information Society Strategy

The government-owned Tonga Communications Corporation (TCC) provides local and international telecom services, including fixed-line connections, mobile phone services and Internet access. There is also a second mobile phone provider, Digicel, which has operated in Tonga since 2008. Deregulation of the mobile phone market has resulted in sharp declines in call costs and rising mobile phone ownership. By 2007, Wi-Fi services were available throughout the main island of Tonga. TCC now provides broadband as well as dial-up Internet access. However, the major constraint on the development of ICT in the islands is the high cost of satellite bandwidth. The result is that most use of ICT in distance education is on a small scale. An example is a recent pilot project in which students from Tonga High School participated in videoconferencing classes at the University of Canterbury. This experiment was successful and now has more chance of being translated into wider practice with the new fibre-optic underwater cable in operation.

Support for OER

Tonga is a participant in the Commonwealth of Learning's Virtual University for Small States of the Commonwealth (VUSSC) project. VUSSC is actively engaged in the development of OER materials for use amongst member states.

The Tonga Institute of Higher Education (TIHE)

Formerly known as the Community Training Centre, TIHE is a tertiary education branch of the Ministry of Education for the Kingdom of Tonga. Its umbrella spans a number of programmes that focus on educating students in a variety of professional aptitudes and vocations.¹¹⁴

ICT in Education Policies, Strategies and Programmes

Major Initiatives

USP Initiatives (USPNet and mLearning Strategies)

The USP Tonga campus provides opportunities for using technology to access learning through the USPNet satellite network for distance and flexible learning formal and vocational programmes. Through USPNet, students have unlimited Internet access to use the university's Moodle platform to interact with lecturers, tutors and students at other campuses, and to access library databases and email.

mLearning support activities have recently been made available to USP students at all 14 campuses of the university (trials first in 2012 at the Laucala campus in Suva and now being used by other campuses). This initiative involves the use of tablets, iPads and SMS messaging from the Faculty of Science, Technology and the Environment in the drive to keep in touch and encourage students to continue (and not drop out). While several campuses have proceeded to provide wireless access for students, which helps where there are insufficient PCs to support the enrolled numbers, USP Tonga is yet to join this group.

USP Tonga was connected to the **fibre-optic cable** in 2014, resulting in much more reliable Internet access for its students and staff. In June 2015, the second phase of this project involved piloting the connection of two schools (Apifo'ou College, Tailulu College) and two tertiary institutions (TTI and TIOE) to USPNet so that these institutions could thereby have access to the Internet. This aims to

¹¹⁴ <http://www.tihe.org/>

provide cheaper access to Internet and educational learning resources for educational institutions in Tonga.

SPC support to the ICT sector in Tonga during the period 2009–2013 included assistance to develop ICT policy, regulations and e-government, and e-government assistance to the Prime Minister’s Office to develop a filing and retrieval system for past, present and future Cabinet documents.

Distance Education Initiatives¹¹⁵

In 2006, the Tonga Broadcasting Corporation (TBC) developed a community education programme for broadcast on radio and television. The documentaries reported on the progress made towards improved living standards in each of the island groups in Tonga, offering different strategies for poverty reduction. The intended audience was government personnel, staff and members of NGOs, and ordinary Tongans. Funding for the radio and television series was provided by the UNESCO International Programme for the Development of Communications. The documentaries were broadcast on the TBC radio station and TV network to widespread acclaim.

The history of the Distance Education and Communication Centre at Pahu provides an example of the challenges facing DE in Tonga. The centre is part of the Community Development and Training Centre at the TIHE. External funding allowed the Ministry of Education to establish a Distance Education and Research Centre in 1992. Its initial role was to carry out research into DE and develop DE programmes for delivery within Tonga. Although the centre has operated under different names for almost two decades, it has never fulfilled its original purpose in terms of DE. Instead, its role is limited to providing classroom instruction in computer technology to Tongan civil servants, private sector employees and members of the community.

Rural Internet Connectivity System (RICS)

A pilot Rural Internet Connectivity System was also proposed, which included ensuring the sustainability of the RICS pilot project by introducing new services in sectors such as education, health and emergency services. For this, SPC provided technical assistance to develop and implement RICS scaling-up plans and ensure a sustainable RICS operational capacity.

One Laptop Per Child Project

Technical and other assistance to implement a pilot project with appropriate governance, including measurement and evaluation components, was provided by SPC. Local content was encouraged and an Internet safety programme developed, prior to the design and implementation of scale-up plans based on the success of the pilot programme. At the time of writing, no further information is available about this project.

Fiji–Tonga Cable System

The Fiji–Tonga Cable System¹¹⁶ project brought high-capacity, high-speed telecommunications to Tonga. It established a connection point in Tonga to the global telecommunications network via a new fibre-optic submarine cable terminating in Suva, where it joins to the western arm of the Southern Cross network. Southern Cross is a telecommunications loop that links Australia and New Zealand with the continental USA via Fiji and Hawaii. The Fiji–Tonga cable will have a scalable capacity that can grow with demand over a design life of 25 years.

The Fiji–Tonga Cable System is a significant development for the Kingdom of Tonga. It will help bridge the “digital divide” that besets countries with small populations, dispersed over great oceanic distances, with limited connectivity to the outside world. The proposed development is a first step in bringing the advantages of secure, high-capacity, high-speed and lower cost communications to Tonga,

¹¹⁵ http://www.icde.org/projects/regulatory_frameworks_for_distance_education/country_profiles/tonga/education_system/

¹¹⁶ From Newsome and Comley (2011).

with an expected positive outcome in terms of improved economic and social development and a country better able to play its part in the Pacific and world communities.

Prospects and Challenges for TEL

Prospects

Despite the concerns and uncertainties, Tonga's prospects for ICT-enabled learning are excellent. The 2013 connection to the Southern Cross fibre-optic submarine cable through Fiji immediately increased access.

- There are high prospects for capacity building and skill enhancement through eLearning at institutions and individually.
- The people of Tonga will have equitable access to telecommunication services.
- They will have choices of affordable services.
- They will have reliable and efficient services.

Challenges

There are, however, challenges that must be addressed. These include:

- ICT policy adoption and establishment to regulate access rates;
- training of facilitators/teachers to assist and guide learners;
- cost and availability of remote power supplies;
- cost of computer hardware and accessories, particularly to ensure regular upgrading;
- setting priorities and targets to develop relevant learning programmes at different levels of instruction; and
- maintaining and strengthening relationships with donor partners.

Tuvalu

Introduction

Previously known as the Ellice Islands, when it was part of the British Gilbert and Ellice colony, Tuvalu consists of nine low-lying coral atolls (no more than five metres above sea level), and more than 100 islets, all spread over 1.3 million km². Eight atolls are inhabited. The two largest atolls are Vaitupu (5.6 km²) and Funafuti (2.8 km²). The total land area is 26 km². Transportation between the nine atolls is by boat.

The economy of Tuvalu is agricultural. Although an ideal venue for tourism, the islands have yet to fully develop that industry. Tuvalu's population of 11,810¹¹⁷ is predominantly Polynesian and largely bilingual (speaking Tuvaluan and English). Thus, population density if spread across total land area would be 384.62/km². However, 4,492 live on Funafuti.

Tuvalu is an independent state and a member of the Commonwealth, the Pacific Islands Forum Secretariat, the Secretariat of the Pacific Community, the University of the South Pacific and other organisations.

National ICT and ICT Access and Use

Tuvalu has serious environmental and economic challenges. The low elevation means its islands are vulnerable to tropical cyclones and future sea-level rises. It also faces increasing isolation and economic disadvantage in a world where connectivity is largely taken for granted. For example, there are currently no ATMs on Tuvalu. The country has only expensive, congested, low-speed Internet connectivity. This constrains innovation and economic development, which means businesses are unable to afford broadband connectivity, even if it were available. Telecom services are provided by the Tuvalu Telecommunications Corporation (TCC), a state-owned enterprise of the Tuvalu government, established under the Tuvalu Telecommunications Corporation Act (1993), and the only operator in Tuvalu. Other telecommunication initiatives are described below under "Major Initiatives." TTC provides fixed-line telephone communications and Internet services to subscribers on each island and mobile phone services on Funafuti, Vaitupu, Nukulaelae, Nanumea and Niutao. TTC is also a distributor of Fiji Television service (Sky Pacific satellite television service). It provides mainly satellite-based services for communications and broadband connectivity between the atolls and the rest of the world.

Table 10. ICT access and use as of 2012¹¹⁸

Fixed (wired) broadband subscriptions per 100 inhabitants	5.57
Estimated Internet users per 100 inhabitants	35.00
Fixed telephone subscriptions	1,450
Fixed telephone subscriptions per 100 inhabitants	14.70
Mobile cellular telephone subscriptions	2,800
Mobile cellular telephone subscriptions per 100 inhabitants	28.38

There was some increase by 2013, as revealed in the 2010 FAIDP review (see Appendix 3).

¹¹⁷ http://www.spc.int/sdd/index.php/en/downloads/cat_view/28-pacific-data/104-populations-a-demographic-indicators

¹¹⁸ <http://www.cto.int/media/ICT-data/Tuvalu.pdf>

Education¹¹⁹

Since independence in 1978, Tuvalu has followed the British “Education for Life” programme to improve the general level of learning in Tuvaluan schools. Those who wish undertake teacher training are given the opportunity to attend international institutes of higher education.

The education system is loosely based on the 3-8-4 model. Attendance at both primary and secondary school is compulsory between the ages of seven and 15. The Tuvalu education system is divided into three stages: early childhood education (ECE) for ages three to five, primary school for ages six to 13 and secondary school for ages 14-17.

Levels of Instruction¹²⁰

Pre-Primary Level

Nineteen ECE centres provide preschool. The ECEs receive some financial support from the Tuvalu government but otherwise are primarily run by their communities.

Primary Level

The first eight years of formal education, from age six, are within a primary school model covering grades one to seven, with an apparent near 100 per cent completion. There are ten primary schools – two on Funafuti and eight on the other islands.

Secondary Level

The next three years (Forms 1-3) are compulsory. A further three years of study in secondary school are available to students wishing to pursue tertiary pathways. There is a single government secondary school on Vaitupu, a boarding school with capacity for about 600 pupils. The school takes students from all of Tuvalu’s nine islands. There is also a non-government secondary school run by the Congregational Christian Church of Tuvalu.

TVET

Tuvalu has three post-secondary institutions of higher education. The Technical Education Centre offers training in the building trades. The Tuvalu Maritime Training Institute (TMTI), established in 1979, is the major TVET provider in the country. The TMTI provides basic training in seamanship for young Tuvaluans seeking employment aboard foreign ships; however, the demand for trained seamen is declining due to the global economic crisis. The UNDP-funded Tuvalu Business Centre provides specialised training courses to assist business development.

The Tuvalu government also provides limited pre-departure training for labour migrants. This includes training for recognised seasonal employer workers departing to New Zealand, as well as seafarers and others. The Tuvalu government depends heavily on NGOs and donor assistance to deliver vocational training relevant to the Tuvalu economy. AusAID was to spend to AUD 2.265 million between 2009 and 2013 to support TVET delivered through rural training centres and Tuvalu secondary schools. AusAID provides short training courses taught by Australian trainers flown into Tuvalu. These courses cover vocational subjects such as motor vehicle maintenance, industrial electronics, joinery, plumbing and electrical generator maintenance.

¹¹⁹ http://www.icde.org/projects/regulatory_frameworks_for_distance_education/country_profiles/tuvalu/education_system/;

http://www.spc.int/prism/images/EducationDigests/TUVALU/Tuvalu_Education_Statistical_Report_2014.pdf

¹²⁰ http://www.icde.org/projects/regulatory_frameworks_for_distance_education/country_profiles/tuvalu/education_system/

Higher Education

Pre-Tertiary and Tertiary Education

Pacific Theological College Education by Extension (PTCEE)

This programme is active in Tuvalu. The PTCEE is aimed at candidates for the ministry as well as lay people. Courses available include a Certificate in Theological Studies, a Diploma in Theological Studies and a Bachelor of Theology.

University of the South Pacific

USP is the main provider of university education in Tuvalu, but the number of USP Tuvalu students is small; in 2008, total enrolments at the Tuvalu campus were only 91 EFTS. However, recent developments of USP programmes to cater to the specific needs of its member countries have resulted in increasing enrolments in Tuvalu. The campus was established as an extension centre in 1988, when course delivery was through printed materials and audio tutorials. In the late 1990s, the USP's delivery of its distance learning programmes moved to online delivery and video-conferencing. In the mid-2000s, its law programme was fully online. The 2006 increase in USPNet bandwidth has encouraged the wider use of new teaching modes, including blended learning.

Like students in other USP countries, those in Tuvalu can choose from hundreds of distance education courses. The 2006 upgrade to USPNet has provided students in Tuvalu with increased electronic access. Those with access to the Tuvalu campus can participate in satellite (USPNet) presentations – tutorials, lectures – to communicate with lecturers and other students. If they miss a session, Tuvalu students on all nine islands have access to recordings. Print-based materials still form the primary method of distance delivery, supplemented by a range of different media: audio/video tapes, CD-ROMs and DVDs, satellite-based videoconferencing and audio conferencing, and eLearning using the Moodle platform. The USP's goal is to move eventually to fully online delivery.

The Future Direction of Tertiary Education

The International Council for Open and Distance Education (n.d.[b]) states:

Reform of higher education in Tuvalu is largely dependent on the direction of USP policies. Adult Education is one area that needs urgent co-ordination with regards its implemented activities. Education of adults has been in the form of unstructured non-formal education. Literacy has come to be recognised as an essential tool for bringing about basic changes in the society. In Tuvalu, illiteracy is not a problem but functional literacy is a major concern. ..

[G]overnment will strengthen [the] adult education network. This will be achieved through the establishment of adult education centres and provision of adult learning resources on all the islands. The Tuvalu Education Technical Centre will be an important part of this network and will provide opportunities for mature age men and women in Funafuti and on the outer islands to learn useful trades as required for the betterment of their lives in rural areas.

ICT in Education Policies, Strategies and Programmes

Although ICT policies have yet to be developed, Tuvalu schools are equipped with computers. The USP also adheres to its institutional ICT policies.

Major Initiatives

The USP Tuvalu campus provides opportunities for using technology to access learning through the USPNet satellite network for distance and flexible learning formal and vocational programmes. Through USPNet, students have unlimited Internet access to use the university's Moodle platform to interact with lecturers, tutors and students at other campuses, and to access library databases and email. mLearning support activities have recently been made available to USP students at all 14 campuses of the university (trials first in 2012 at the Laucala campus in Suva and now being used by other campuses). This initiative involves the use of tablets, iPads and SMS messaging from the Faculty

of Science, Technology and the Environment in the drive to keep in touch and encourage students to continue (and not drop out).

OLPC and VUSSC

Tuvalu is a participant in the OLPC Oceania project and the COL Virtual University for Small States of the Commonwealth project. Neither project appears to have had any significant impact on Tuvalu to date.¹²¹

Support for OER¹²²

Two Learning for Content (L4C) workshops were held on Vaitupu from 25 November to 2 December 2008. The workshops were sponsored by the Hewlett Foundation, WikiEducator, the Commonwealth of Learning and Otago Polytechnic. These workshops resulted in the creation of WikiEducator pages on Tuvalu education. In addition, there are significant OER components in the OLPC Oceania and VUSSC projects. In a recent communication, an official of the Ministry of Education, Youth and Sports stated that OER is in the draft policy being developed.

ABS–TTC Partnership for High-Speed Internet¹²³

This five-year project will provide high-speed Internet connectivity to support TTC's growing infrastructure. Under the multi-year contract, TTC will use the C-band -- a beam capacity on ABS-6 to increase the volume of traffic to the Tuvalu islands, offering high-speed Internet to support schools, banks, hospitals and IP backhaul for its mobile network. A dish has been erected on Funafuti (main island), and plans were underway to build another disk on the island of Vaitupu during July 2015, to help provide services to the government high school there. The ABS focus is on networks – mobiles and wireless – and the disturbance caused by rain and strong winds is minimal using ABS. Similar setups are planned for other outer islands, subject to funding availability.

TTC-Kacific Singapore

This is also a five-year agreement to provide high-speed bandwidth to the company and the people of Tuvalu. The multimillion-dollar service agreement is the first that Kacific has signed with a national telecommunication service provider. This will have a footprint approximately 800–1000 km wide, sufficient to cover not just the 26 km² of land but most of Tuvalu's 900,000 km² of the EEZ. The Tuvalu beam will be optimised so that all islands in the group will receive sufficient satellite power for customers to operate at high throughput speeds using only a small (75 cm to 1.2 m diameter) terminal. Because TTC committed to Kacific at the design stage of the project, it has been able to secure a high-bandwidth, high-power, dedicated beam. Since Kacific is not a one-size-fits-all satellite, its team will now customise its satellite design and the Tuvalu beam to ensure that the required level of service and future bandwidth growth can be sustained throughout the Tuvalu island group. This is expected to have a very significant impact on telecommunications services in Tuvalu, multiplying bandwidth and coverage by a factor of 15 or more. That will in turn spur economic growth and lead to improvements in all sectors, particularly education and health, as schools and medical clinics on outer islands are currently without Internet access. That is, the TTC agreement with Kacific will solely focus on providing Internet connections to homes, hospitals, island clinics, schools – primary and secondary – in Funafuti and outer islands. There will be costs attached to usage, but connections will be reliable. The project is expected to be implemented by 2017.¹²⁴

Pilot eLearning Project to Three Primary Schools

A personal email communication from an official in the Ministry of Education in July 2015 stated the following:

¹²¹ http://www.icde.org/projects/regulatory_frameworks_for_distance_education/country_profiles/tuvalu/education_system/

¹²² Ibid.

¹²³ Personal communication from the campus director of USP Tuvalu on discussions with the CEO of TTC, 16 June 2015.

¹²⁴ Ibid.

This initiative is being trialed this year (2015), right across levels at Funafuti primary and two outer islands schools. Funafuti primary school has a school population of over 800 students and, with the two outer island schools with average school population around 200 students each, this means over 1,000 students involved in this trial-run initiative. After the trial run, the initiative will be extended to all other schools.

The project has two components: first it relates to resources/curriculum and the other focus [is] on Moodle. In other words, the project runs across all subject areas in the primary [level].

As is the nature of pilots, this initiative will serve as a proof of concept as well as a means of identifying practical challenges and limitations of the pilot design/specification so as to ensure adjustments for improvement are optimised in the full implementation that will follow the pilot. The initiative has a short-term goal of playing a role in improving literacy and numeracy in the primary school level through improved access to teaching and learning resources. The initiative also has a longer term goal of providing an environment at all school levels that will allow for independent learners to blossom and flourish so as to provide a smoother transition to higher education and the work force. Both the short- and long-term goals will be driven by exposure to information and capacity building on information literacy.

As our outer islands have limited to no Internet access (only the Island Council Offices, locally referred to as Kaupule, have Internet access), the pilot design/specifications include a Web server to provide an intranet for each school (much like USPNet services, including Moodle, BANNER, SOLS, etc.) which, by nature, does not require an Internet connection. The intranet setup will include four core components: a digital library (based on the World Possible Rachel¹²⁵ project), Moodle as a learning management system (LMS), a wired and wireless network infrastructure, and access devices, including computer labs, tablets, etc. Other intranet services will be gradually introduced to avoid information overload, and of course, when nationwide Internet access is available and reliable, the schools can then be connected with their existing network infrastructure (something that is currently non-existent for most schools).

Prospects and Challenges for TEL

According to a Tuvalu Ministry of Education, Youth and Sports IT official, in a personal email communication on 1 September 2015:

There are prospects in leveraging the eLearning intranet infrastructure to support teacher training programmes (through multimedia training resources), EMIS [education management information systems], and possibly even school management systems (for administrative work such as time-tabling, school report generating, etc.).

The official confirmed that there is currently no ICT in education policy; however, work is being carried out on the National Development Plan (Te Kakeega II, or TKII), and aligned to this revised TKII will be the education sector plan (Tuvalu Education Strategic Plan II). In the review and revision work (during 2014), a national ICT plan was drafted.

The official also confirmed that

ICT in education is mentioned in the draft ICT policy, in the recommendations for the revised TKII, and also within the review of TESP II. Upon finalisation of these policies, with reference to the ICT in education policy, we plan to then develop and implement a national ICT in education policy to link up to relevant priority areas mentioned in the other three policies.

As well, “there is also mention of OER in the draft ICT Policy – a topic that will be elaborated and strengthened a bit more in the ICT in education policy, not forgetting the licensing side of things.”

¹²⁵ https://www.google.ws/?gws_rd=cr,ssl&ei=pMUHVtDcJcPLmwXYxo-YAQ#q=world+possible+rachel and <http://worldpossible.org/>

Thus, whilst there is “no ICT policy in place, it is definitely a priority area so as to map out a way forward to clear goals on leveraging ICT to support existing and new education initiatives. This also applies to related topics such as gender issues and open licensing.”

Prospects

Tuvalu is poised to have significant access through the two projects outlined. This will ensure the following:

- The people of Tuvalu will have equitable access and a choice of telecommunication services.
- According to the Tuvalu Electrical Corporation management, soon all outer islands will have 24-hours power supplies.¹²⁶
- The installation of solar-powered generators will reduce electricity supply costs.
- It is expected that the developments will mean affordable, reliable and efficient services.
- ICT in education is set to increase after the pilot project involving three primary schools.
- The education prospects are also promising, with learning projects now underway in three primary schools.
- Further USP ICT developments in mLearning also provide future prospects for education in the country.

Challenges

- Cost and availability of remote power supplies for outer islands
- Remoteness of locations and sparse distribution of the local population
- Cost of computer hardware and accessories
- Availability of suitable technology and associated costs
- Skill availability and competency levels

¹²⁶ Statement by the GM of TEC to the USP Campus Advisory Committee at a June 2015 meeting.

Vanuatu

Introduction

Formerly known as the New Hebrides, Vanuatu includes 13 larger islands and about 70 smaller ones in a Y-shaped chain that spreads across 848,000 km² of sea. Most are mountainous (volcanic in origin, highest peak 1,877 m) and covered in lush rain forests. Many are protected by coral reefs. The largest island is Espiritu Santo (3947 km²). The total land area is 12,190 km². Some active volcanoes exist on Ambrym, Gaua, Tanna and Lopevi. The main island, Efate, has Port Vila, the capital and the centre of administration and commerce. The islands are subject to devastating cyclones, such as Cyclone Pam in March of 2015. In 1980, the country became independent from the UK and assumed the name Vanuatu as well as a new constitution.¹²⁷

The official population estimate in 2015 was 277,506. Some 39,300 reside in Port Vila, and 24.9 per cent live in urban areas.¹²⁸ There are over 110 distinct languages and dialects in Vanuatu. Bislama, English and French are the national languages.

National ICT and Internet Access and Use

Prior to 2008, Telecom Vanuatu Limited (TVL) was the sole telephony provider, but the liberalisation of the country's telecommunication market introduced Digicel into the mobile sector, bringing competition and considerable rate reduction. This resulted in a huge increase in subscriptions. A recent study by the Vanuatu-based Pacific Institute of Public Policy revealed that 96 per cent of households in Vanuatu own a mobile phone and 99.4 per cent have access to one. The country's ICT revolution has also seen the increasing penetration of the Internet through new licensees entering the market, further supported by projects such as the Rensarie Telecentre facility. In addition, the government broadband network connects government agencies in all of the provinces, providing a foundation for better intra-government communication, which has increased government efficiency and the deployment of e-government services.

According to a senior government official,¹²⁹ four ICT developments were the most significant:

1. "the decision by government in 2007/8 to open up the sector to competition," which resulted in increasing "both coverage and penetration in relation to mobile phone usage . . . from about 16–20 per cent coverage and penetration to more than 90 per cent coverage, including penetration as well . . . one of the highest levels of penetration in the Pacific, even compared to New Zealand."
2. "to establish a robust and integrated institutional governance framework, which included amalgamating several relevant portfolios within the Prime Minister's Office and establishing the Telecommunications and Radiocommunications Regulator (TRR)."
3. "the arrival of submarine fibre-optic cable in Vanuatu in early 2014 . . . [which] has significantly increased the international capacity by more than 50 per cent. And obviously the speed of Internet over fibre, it's non-comparable to the satellite connectivity. That's now put us on a level playing field with any of our regional or international competitors."
4. "the adoption of key policies: The national ICT policy provides a very clear roadmap for the development of the sector around eight core priorities:
 - Access to ICT in education

¹²⁷ <http://www.worldatlas.com/webimage/countrys/oceania/vn.htm>

¹²⁸ http://www.spc.int/sdd/index.php/en/downloads/cat_view/28-pacific-data/104-populations-a-demographic-indicators

¹²⁹ See Cain and Tarisongtamate (2014).

- Access to ICT infrastructure and devices
- E-government
- Integration of ICT into sectoral policies (e.g. agriculture, trade, finance, forestry, health)
- Building trust, and mitigating risks and threats related to ICT development
- Developing locally relevant content
- Building capacity, including literacy
- Establishing a platform for multi-sector coordination and collaboration

Alongside this, the Universal Access Policy (UAP) sets an ambitious target of making ICT available to 98 per cent of the population of Vanuatu by 2018.”

Significant to this study, this government official also confirmed that there are numerous other opportunities in many sectors, including education:

we’re connecting Internet for 15 schools, as well as giving a tablet programme for, at first, five schools. . . . With the tablet, provided it’s connected to the Internet, you have access to 100s of millions of items of online content and library books. So, once the teachers and students have access to all this great information in real time that will obviously help their capacity. And hopefully ICT will contribute to the improvement of literacy in Vanuatu. Our goal is to start with 15 then . . . to try and connect all . . . 80 schools and make sure all of them are connected to ICTs.

Vanuatu’s prospects are also expected to be boosted at the completion of the second submarine telecom cable construction, which will link Port Vila to Fiji.¹³⁰

The establishment of the National ICT Development Committee (NIDC) in January 2013 led to a resolution to bring to Vanuatu services available in most of the world, such as online education, e-commerce, mobile banking, telemedicine, phone or online consultations with experts – in agriculture, transport and other fields – registering new businesses online, e-democracy and public consultation, amongst others. The NIDC comprises 25 members, from the public, NGOs (including the Vanuatu Society of Disabled People, chiefs, women representatives and church leaders) and private entities.

Recent key developments include the following.¹³¹

- The telecom regulator has been holding public consultations on spectrum for fixed telecoms services, mobile broadband, and Long Term Evolution (LTE) or 4G.
- The government has approved a national ICT policy.
- WanTok Network Ltd. has launched broadband in Port Vila over a 4G LTE TDD¹³² network.
- A second submarine cable, ICN2, is scheduled to be ready for service in June 2016.
- The submarine cable system ICN1 has an initial capacity of 20 Gb/s, upgradable to 1.28 T/s, whilst ICN2 will have an initial capacity of 40 Gb/s, upgradable to 1.2 Tb/s.
- In September 2014, Vanuatu was one of 11 island nations to become the recipient of an agreement between ITU and satellite company Kacific under which the latter would establish 55 e-centres in remote islands of the Pacific region.

Whilst these developments are very promising, the reality is that considerable challenges remain:

“We need energy. We definitely need a quality, reliable power source in all the rural areas of Vanuatu. I can tell you specifically that with the three major operators – the e-government network, TVL and Digicel – we still build our own power sources to reach some of the most remote places in Vanuatu.” . . . Vanuatu also needs roads, wharves, airports and “financial

¹³⁰ <http://www.islandsbusiness.com/component/k2/item/706-vanuatu-taps-into-ict-sector-moves-closer-to-a-nat>

¹³¹ <http://www.budde.com.au/Research/Vanuatu-Telecoms-Mobile-and-Broadband-Market-Insights-and-Statistics.html?r=51#sthash.Q6kUYtys.dpuf>

¹³² <http://www.lightreading.com/mobile/4g-lte/just-what-is-lte-tdd-anyway/d/d-id/688906>

infrastructure,” by way of access to financial services, for more people so that they can use ICT tools to improve their livelihood opportunities and contribute to the economic growth of the country. (Cain & Tarisongtamate, 2014)

The following reveals the situation prior to the FAIDP 2010 review.¹³³

Table 11. Penetration rate in 2012

Fixed (wired) broadband subscriptions per 100 inhabitants	1.03
Estimated Internet users per 100 inhabitants	10.60
Fixed telephone subscriptions	5,800
Fixed telephone subscriptions per 100 inhabitants	2.30
Mobile cellular telephone subscriptions	137,000
Mobile cellular telephone subscriptions per 100 inhabitants	54.44

National ICT Policy

The policy declares that “[a]ccess to ICTs in schools in particular, and also for Vanuatu citizens and residents in general, will be radically expanded,” and that “ICTs will transform government services and public administration, as well as supercharge advance in all areas related to socio-economic development,” whilst recognising the “risks and downsides of the increased utilisation of and dependence on ICTs and provid[ing] an impetus for their mitigation, especially through empowerment of users of respective tools and services” (Republic of Vanuatu, 2013).

Education

The Vanuatu Education Sector Programme Design Document (15 October 2012) covers development partners’ support for the Vanuatu Education Road Map 2009,¹³⁴ from 2013 to 2017. Development partners, for example AusAID, have acknowledged that results will only be realised over a longer term, ten-year planning horizon, to which partners are committed. The Vanuatu Ministry of Education and Training (MoET) is responsible for delivering education and is the largest service deliverer and employer in the country. The education system is trilingual, with vernacular education in Bislama, French and English.

Some significant issues that impact education are:

- high levels of poverty and vulnerability, despite a moderate gross national income per capita (USD 1,737 in 2009) and a medium Human Development Index ranking (125th out of 187 countries);
- a dramatic rural–urban income difference – over 80 per cent of the population depends on agriculture for their livelihood, yet the rural sector contributes only eight per cent of GDP;
- around 13 per cent of people live below the national basic needs poverty line, and a further 22 per cent are estimated to be vulnerable to experiencing poverty (i.e., from food or fuel price increases), as they are close to the poverty threshold;
- the adult literacy rate is only 33 per cent; and
- the country is extremely vulnerable to violent natural shocks, including tropical cyclones, volcanic eruptions, earthquakes, flood and droughts.

Primary Education

Primary education is a priority for Vanuatu’s development. Education is a key driver of economic development and poverty reduction. It enhances people’s ability to make informed decisions, be better parents, sustain a livelihood, adopt new technologies, cope with shocks and be responsible citizens. Women with at least a basic education have higher standards of hygiene, health and nutrition.

¹³³ <http://www.cto.int.country-ict-data/pacific/ict-data-for-vanuatu/>

¹³⁴ http://planipolis.iiep.unesco.org/upload/Vanuatu/Vanuatu_Education_Road_Map_2009.pdf

Investing in good education that is empowering makes people aware of their human rights, fosters democracy and contributes to political stability.

The Government's development agenda, *Priorities and Action Agenda for Vanuatu 2006–2015*, has as its vision "an educated, healthy and wealthy Vanuatu." One of its three overarching goals is improved access to primary education. It strongly endorses the education MDG and the international "Education for All" goals. The agenda identifies four main policy objectives for the sector:

- Improve access to education and ensure gender and rural/urban balance
- Raise the quality and relevance of education
- Improve planning, fiscal and financial management in the sector
- Develop a distinctively ni-Vanuatu education system.

Access, Equity and Quality of Primary Education

The net enrolment rate for primary education – the proportion of school-age children enrolled – fell from 88.1 per cent in 2010 to 87.9 per cent in 2011, so achieving the education MDG is unlikely. The seven per cent increase in 2010 corresponded to the first year of the school grants scheme, but the increase was only 1.2 per cent in the scheme's second year. The high gross enrolment rates (GER) (over 100 per cent) reflect a high proportion of over-age children. Net enrolment rates are also low and static for ECE and secondary education.

Post-Secondary Education

The University of the South Pacific in Port Vila is an educational institution co-owned by 12 Pacific countries. The Vanuatu campus teaches Pacific languages and hosts USP's only law school. The Australia-Pacific Technical College's Schools of Tourism and Hospitality and Health and Community Services also operate in Port Vila, offering vocational training for ni-Vanuatu.

ICT in Education Policies, Strategies and Programmes

The government's Universal Access policy (UAP) was announced in October 2014.

A project supported by DFAT (Australia) was planned to start in August 2015 through 22 pilot learning centre sites with tablets and servers. This initiative was the subject of a press release in October 2014 from the Office of the Government Chief Information Officer,¹³⁵ and further details were provided by government officials through the USP campus group manager:

Two years ago the Ministry of Education was assisted by the Office of the Government Chief Information Officer (OGCIO) under the office of the Prime Minister. This effort was guided by the National Policy on ICT and the MoE ICT policy. As one of its main implementation goals the National Policy aimed at reaching the communities through the schools.

- Introducing Internet and communications technology, or ICT, into schools was first established as a priority when the National ICT policy was announced in late 2013.
- The office of the OGCIO collaborated with the Telecommunications and Radiocommunications Regulator in partnership with the Ministry of Education to implement this project.
- A pilot was decided on and after a survey of over 300 schools, applications were offered to the schools that showed interest and 22 were selected. Of the 22, 15 schools will be provided with computer labs and seven with tablets. A thousand tablets will be provided.
- Three private sector bids to provide commercial Internet café services to rural communities were also selected so that three communities will be provided with Internet cafés.

¹³⁵ See http://ogcio.gov.vu/images/press%20stories/A%20new%20dawn%20in%20education-ICT%20Enabler_final.pdf

- This pilot phase is expected to reach around 9,000 students, teachers and education professionals in secondary and primary schools.
- Contracts with companies to provide the equipment have been signed, and work will start in the schools by August 2015. Sixty participants (teachers and some Zone Curriculum Advisors) will be trained.
- From the pilot and with lessons learnt, more schools will be assisted and provided with computer labs and tablets in the coming years until all schools are reached. This will take some years but this is the government's intention.
- The Ministry of Education is riding on the national policy being driven by the prime minister's office, which facilitated this whole process. Initially, the Australian government is financially assisting, but OGCIO through TRR obtained the co-operation of all the telecommunication companies to complement this effort.
- Currently, the curriculum development unit has provided the curriculum materials to be put in the tablets. Other resource materials will also be installed and the means to update will be put in place.

Other Major Initiatives

In addition to the pilot learning centre sites, other initiatives include the following.

University of the South Pacific

The USP Emalus campus in Vanuatu provides opportunities for using technology to access learning through the USPNet satellite network for distance and flexible learning formal and vocational programmes. Through this, students can access online courses and have unlimited Internet access to use the university Moodle platform to interact with lecturers, tutors and students at other campuses, as well as to access library databases and email and attend tutorials. USP teaches programmes from pre-tertiary (College of Foundation Studies) to post-graduate. Whilst the main campus is located in Suva, Fiji, the USP Emalus campus offers all university programmes, including those on various aspects of IT, either by distance modes or face-to-face by demand. That is, all programmes are accessible (agriculture from the Alafua campus in Samoa, and others from the Laucala campus in Fiji. Support services include IT services, and computer labs are fully utilised. Although students are able to access the Internet, the Emalus campus has too few computers, given its very high enrolment.

mLearning support activities have recently been made available to USP students at all 14 campuses of the university (trials first in 2012 at the Laucala campus in Suva and now being used by other campuses). This initiative involves the use of tablets, iPads and SMS messaging from the Faculty of Science, Technology and the Environment in the drive to keep in touch and encourage students to continue (and not drop out). As well, several campuses including USP Vanuatu have proceeded to provide wireless access for students, which help where there are insufficient PCs to support the high enrolled numbers.

Telecentre Facility in Rensarie

This gives the local community, a secondary school and a health centre access to the Internet and relevant training.

OLPC

Two pilots were organised by the Ministry of Education for Vanuatu. Whilst the education system is trilingual, only English and French pilots were able to start, due to time constraints. The French pilot was to link to the Haiti OLPC project, which has developed resources to match the French education system. The trials were to be implemented in collaboration with the Wan Smolbag community theatre group, to link with the educational drama activities and produce local content for the XO laptops. This is the only reported OLPC programme in the Pacific that was facilitated by an NGO.

Deployments in Vanuatu commenced in July 2008 with the delivery of 25 XO laptops to Wan Smolbag in Port Vila. A well-established NGO providing education and awareness-raising services in Vanuatu

and around the Pacific Islands, Wan Smolbag produces educational programmes in various media, including DVDs, films, documentaries and live performances. By November 2008, Wan Smolbag had successfully “incorporated the use of the OLPC into the pikinini literacy classes, and was using these three times a week to explore news ways in teaching and also to encourage the children to learn, explore and take control of their own learning” (One Laptop per Child, 2014). No further information is available as to the current status of this project.

COL Aptus

The Government of Vanuatu, through the Ministry of Education, and the Commonwealth of Learning, have collaborated to deploy the COL Aptus in support of the national project for distribution of tablet computers in education. Aptus is a recent development by COL, based on the idea of a “classroom without walls.” This is where “a learner in a typically unconnected environment can access a lesson in a learning management system and complete an assignment, with her/his credentials intact and available to the teacher. Learners can also participate in a socialising process through visiting and commenting on a blog related to the learning materials and courses” (Commonwealth of Learning, n.d.). Launched in September 2013, Aptus has been tested in 17 countries.

The current version of Aptus provides access to about 3,000 videos from the Khan Academy, about 100,000 articles from the Simplified Wikipedia in English, and Wiktionary, which contains about three million entries. It can hold thousands of books in PDF or EPub format. It also provides a WordPress installation to allow teachers to add their own content. File sharing is available through OwnCloud,¹³⁶ an open source solution.

Prospects and Challenges for TEL

Prospects

- ICT policy development through the work of the NIDC: Universal Access Policy
- Capacity building and skill enhancement in the MoET plans
- All students in secondary and primary education will eventually use ICT and access the Internet
- The people of Vanuatu will have equitable access to telecommunication services
- Consumers will have a choice of service providers
- Services will be affordable, reliable and efficient

Challenges

These are related to the high levels of poverty and vulnerability that exist, despite the moderate per capita income. Around 13 per cent of citizens live below the national basic needs poverty line, and a further 22 per cent are estimated to be vulnerable to experiencing poverty (i.e., from food or fuel price increases), as they are close to the poverty threshold. The challenges are:

- the cost and availability of remote power supplies;
- the remoteness of locations;
- the cost of computer hardware and accessories;
- the availability of suitable technology and associated costs; and
- skill availability and competency levels.

¹³⁶ <https://owncloud.com/>

Summary of Findings

In the nine countries covered by this study, the story is similar in almost all. Evidently, very few have managed to take advantage of the technology available, and challenges remain for the majority. It is also clear that donor agencies have been helpful to the struggling nations, providing funds – especially in the form of grants – so that the necessary basic technological infrastructure is installed and equipment can be donated or purchased.

Difficulties in establishing the requisite information technology infrastructure have been the main cause of delay. However, apart from one or two, these countries have found possible solutions and are moving forward in establishing the much-needed basic infrastructure to enable communication technologies that can support and enhance education. Some countries have developed alternatives alongside main access – for example, Samoa is using both fibre-optic and satellite technology. All of the countries have experienced and continue to experience insurmountable affordability issues, particularly in their rural areas, where electricity is also a significant challenge in terms of cost. Nonetheless, progress has been made in the Pacific Commonwealth nations.

Appendix 2 provides a summary of the information gathered. Much diversity remains, from nations that have progressed and developed policies to assist in regulating technology, to those that have yet to draft any guidelines. Plans to ensure the sustainability of initiatives have been developed by some, and in at least two countries, the responsible ministry has followed up the initial externally funded project by including ongoing support in its central resources.

With access to high-speed Internet through its connection to the Southern Cross fibre-optic cable since 2000, Fiji has been able to move forward rapidly, establishing widespread Internet access in primary and secondary schools as well as communities through national projects overseen by the MoEHA. One such successful project is OLPC, piloted in 2010 in three primary schools and expanding to include 72 more schools to date. Significantly, 100 teachers have been trained to facilitate learning using the laptops. Further, in the Fiji ministry's strategic plan, 15 per cent of school grants must be spent on ICT. Currently, nearly all Fiji secondary schools have a computer lab and Internet access and teach IT as a subject, whilst 75 primary schools, mostly rural, have the OLPC laptops and over 100 teachers have been trained by the Teachers' Educational Resource and E-Learning Centre. The recent donation of 5,000 tablets from India will boost the efforts of MoEHA to expand the project to more schools, as the "green laptops" are no longer being manufactured.

In Solomon Islands, at the National University, the teacher development programme – delivered by distance and flexible learning methods – uses radio for disseminating information to teachers and their mentors and for offering guidance in professional studies, whilst printed course materials are studied with support from mentors (the head teacher and a master teacher). Thus, radio is the technology being used.

Many ICT-related projects have not succeeded, from satellite networks to OLPC. Common threads in these ventures include a disconnect or mismatch between the facilitators/teachers and the purpose of the initiative for which equipment is specifically tailored. The OLPC initiative is a classic case: whilst the children were reportedly fascinated, the teachers were mostly untrained and were unable to understand the activities on the laptop or the purpose for which they were created. The children obviously connected with the technology, but they needed support from facilitators to help them engage with the technology appropriately. In most countries, the children could not use the activities as they were intended, and the technology lay idle. In Fiji, over 100 teachers have been trained, and now 75 primary schools are using the laptops.

Much needs to be included in plans for ICT applications for education – for example, skills development to ensure that the content of the materials provided to learners is presented through quality instructional design, assessment and course management, and that facilitators and teachers will receive appropriate training to ensure delivery. Training of teachers has been acknowledged as the basis for the success of the Samoa SchoolNet where almost all secondary schools are involved, and

which the Ministry is incorporating into its central resources after the donor funding ends. Moreover, various factors must be considered during planning, including costing, sustainability and, given the lifespan of current technology, plans for periodic replacement.

Producing relevant programmes that use new technology can be assisted by accessing OER, now readily available through various links. In a few countries covered by this study, the use of OER is being explored and actively pursued as a time- and cost-saving source of learning materials.

The challenge of affordability has been highlighted in many countries. Inevitably this will lead to technology being put aside and discarded. It has been seen that not only are the high costs of telecommunication access challenging, but so is obtaining the hardware necessary for the classroom. There are examples of projects either not starting or not being sustained after a grand launch because of hardware issues. Indeed, as was experienced in Samoa, the dynamic nature of technology has introduced a need to regularly upgrade and revise curricula content and teacher training, to avoid obsolescence. This essentially requires substantial financial resources. At the Fesoota'i centres, hardware replacement is a significant challenge. This is related to management practices that should be in place to ensure regular upgrades of equipment.

Whilst the OLPC "green laptops" are no longer produced, a new technology – the XO Tablet – debuted in 2013 at US Wal-Mart locations for USD 149.¹³⁷ This new technology could be a replacement for the "green laptop."

The attraction is the affordable cost. However, the contents may be unsuitable for Pacific users.

Another new technology is the COL Aptus, which is also affordable and offers a very large amount of resources.

As countries become more aware of the challenges, and successful solutions are devised, adopted or adapted, technologies that enable learning can be of great assistance to teachers and facilitators as they strive to achieve targets for learning in their institutions.

In summary, there is a need for (i) sound planning to address all of the factors that will ensure the successful implementation of any initiative and (ii) policies that will direct/guide the various processes involved, including those that will ensure a regulatory environment for telecommunications.

For education initiatives to succeed and be sustainable, the technology must be appropriate, and those facilitating learning must be trained prior to working with the new technology and have a thorough understanding of the programmes for which it is to be used. The OER community is now able to offer a wide variety of learning resources. However, only a few countries in this study are contemplating using such resources, despite the offer of free materials. Cautionary comments have been made to ensure the content is relevant to the context of each country.

Thus, it is not just the technology but the whole package that must be thoroughly prepared/understood. The factors to be considered in each instance are:

- the programmes it can deliver/enhance/support;
- who are the most appropriate target users;
- whether the programmes/content are appropriate and relevant to the context of the Pacific nations; and
- whether the technology is affordable, not just for the institution, but also for individual users.

Finally, the countries of the Pacific region have been strengthened through partnerships that enable development to proceed and progress. Several regional groups have been successful and continue to be successful in their mandates to serve the region. Nationally, successful partnerships between

¹³⁷ http://blog.laptop.org/2013/07/16/family-oriented-xo-tablet-debuts-at-walmart-for-149/#.VgeW_pdAdtQ

government and donor agencies, the private sector, NGOs, as well other regional organisations have overcome the difficulties faced by these island nations, where small size and lack of natural resources lead to issues of scale, vulnerability and sustainability. It makes sense, therefore, that relationships between countries and donor agencies be maintained and partnerships nurtured to ensure continuing success.

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Appendix 1: Terms of Reference

To undertake a desktop study by reviewing documents available on the Web and through online/email surveys of stakeholders, so as to develop a baseline study report for COL in the area of technology-enabled learning in the Commonwealth countries of the Pacific region, covering Fiji, Kiribati, Nauru, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu.

The report shall include the following:

- Country-wide status of ICT in education, including the availability of policies related to ICT, ICT in education, open educational resources (OER), etc.;
- National priorities and initiatives on ICT in education, including the presence of major donors and their activities in the area of technology-enabled learning;
- Identification of key agencies/institutions and ministries involved in technology-enabled learning;
- Identification of institutions offering courses using technology (especially online learning) and the availability of institutional policy for eLearning/technology-enabled learning;
- Availability of OER repositories in different subjects, including identifying gaps in the topics/subjects related to media and ICT skill development;
- Estimate of approximate number of teachers to be trained in the next six years in the area of technology-enabled learning in each of the countries;
- Estimate of approximate number of students studying ICT and media-related courses in each of the countries.

The report should critically examine the country-wide reports and also present consolidated tables as appendices, as needed.

The expected length of the reports shall be about 30 pages (A4 size, with about 320 words per page), excluding appendices, and will use APA 6th edition reference style.

Chapter Outline for Regional Baseline Reports

Overview of the region (geography, population, uniqueness; about 500 words)

Regional ICT in education trends (about 800 words)

Country reports (each about 1,000 words):

- Introduction (covering geo-political, economic and socio-educational contexts)
- National ICT and ICT in education policies, strategies and programmes
- ICT access and use
- Major initiatives
- Prospects and challenges for technology-enabled learning

Appendix 2: TEL in the Commonwealth Pacific Island Countries – Summary Information

Country	Fiji	Kiribati	Nauru	PNG	Samoa	Sol. Islands	Tonga	Tuvalu	Vanuatu
ICT in education policy? If yes, see link(s) to source(s).	Y MoEHA http://www.education.gov.fj/images/Legislation/Policies/SIMS%20POLICY%202012.pdf http://www.education.gov.fj/index.php/services/policies	N MOE Policy being developed	Y www.naurugov.nr a/a	Y http://www.education.gov.pg/QL_Policies/index.html	Y MESC www.mesc.gov.ws	N	Y MIC www.mic.gov.to MOET http://www.mic.gov.to/ministrydepartment/14-govt-ministries/moet?layout=default	Being drafted in 2015	Y MoET www.moet.gov.vu www.ogcio.gov.vu...ICT%20Policy-Vanuatu-National-ICT-Policy
Year of ICT in education policy. Is revision due?	2012, not due for revision	Policy being developed	N/A	N/A	2006–2015 Y	2015 (draft)	N/A	Policy being developed	2013 N
ICT in education policy covers OER?	Y www.fijieducators.fhec.org.fj	N	N/A	N/A	N/A	N/A	N/A	Y (draft)	N/A
ICT in education policy covers gender issues?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Y (draft)	N/A
National open licence policy available? If yes, see the link.	Y www.itc.gov.fj www.ptc.org/ptc11/images/papers/upload/Smith_Daniel_PPT.pdf	Y Communications Commission of Kiribati http://www.cck.ki/index.php/downloads/finish/23-publication/48-communication-act-2012.html http://www.mfe	N	Y http://www.acma.gov.au/webwr/_assets/main/lib312019/4.2%20plenary;%20session%20ofocussing%20on%20needs%20of%20asia-pacific%20%28une%20o'omi%	Y www.mcit.gov.ws www.ptc.org/ptc11/images/papers/upload/Smith_Daniel_PPT.pdf	Y www.ptc.org/ptc11/images/papers/upload/Smith_Daniel_PPT.pdf	Y www.ptc.org/ptc11/images/papers/upload/Smith_Daniel_PPT.pdf	Y www.En.wikipedia.org/wiki/Tuvalu	Y www.ogcio.gov.vu...ICT%20Policy-Vanuatu-National-ICT-Policy www.ptc.org/ptc11/images/papers/upload/Smith_Daniel_PPT.pdf

Country	Fiji	Kiribati	Nauru	PNG	Samoa	Sol. Islands	Tonga	Tuvalu	Vanuatu
		d.gov.ki/sites/default/files/Kiribati-ICT-Policy-Mar-2-2011.pdf www.ptc.org/ptc11/images/papers/upload/Smith_Daniel_PPT.pdf		20nicta%29.pdf www.ptc.org/ptc11/images/papers/upload/Smith_Daniel_PPT.pdf					
Open licence policy for projects/institutions ? If yes, see the project/institution and the link.	Y ITC www.itc.gov.fj www.ptc.org/ptc11/images/papers/upload/Smith_Daniel_PPT.pdf	Y Communications Commission of Kiribati http://www.cck.ki/index.php/downloads/finish/23-publication/48-communications-act-2012.html http://www.mfed.gov.ki/sites/default/files/Kiribati-ICT-Policy-Mar-2-2011.pdf www.ptc.org/ptc11/images/papers/upload/Smith_Daniel_PPT.pdf	N	Y http://www.acma.gov.au/webwr/_assets/main/lib312019/4.2%20plenary;%20session%20ofocussing%20on%20needs%20of%20asia-pacific%20%28une%20o'omi%20nicta%29.pdf	MCIT www.mcit.gov.ws www.ptc.org/ptc11/images/papers/upload/Smith_Daniel_PPT.pdf	Y www.ptc.org/ptc11/images/papers/upload/Smith_Daniel_PPT.pdf	Y www.ptc.org/ptc11/images/papers/upload/Smith_Daniel_PPT.pdf	N/A	Y https://ogcio.gov.vu/ICT%20Policy/Vanuatu-National-ICT-Policy-EN.pdf
Major OER repositories ? If yes, see the name and the link.	Being planned www.fijieducators.fhec.org.fj	N/A	N/A	N/A	N/A	N/A	N/A	In draft	N/A
Institutions offering online programmes	USP www.usp.ac.fj	USP Kiribati www.usp.ac.fj/kiribaticampus	USP Nauru www.usp.ac.fj/naurucampus	N/A	USP Samoa www.usp.ac.fj/alafua	USP Solomon Islands www.usp.ac.fj/solomoncampus	USP Tonga www.usp.ac.fj/tongacampus	USP Tuvalu www.usp.ac.fj/tuvalucampus	USP Vanuatu www.vanuatu.usp.ac.fj

Country	Fiji	Kiribati	Nauru	PNG	Samoa	Sol. Islands	Tonga	Tuvalu	Vanuatu
Institutions with policy on eLearning and/or TEL	<p>FNU: http://ict.fnu.ac.fj/policy.html</p> <p>UoF: http://www.unifiji.ac.fj/information-and-communication-technology-ict-policy/</p> <p>USP: www.usp.ac.fj</p> <p>USP Labasa: www.usp.ac.fj/labasacampus</p> <p>USP Lautoka: www.usp.ac.fj/autokacampus</p>	<p>USP: www.usp.ac.fj/kiribaticampus</p> <p>National Library: http://www.moe.gov.ki/archives/greenlaptopsinkiribati</p>	<p>USP www.usp.ac.fj/naurucampus</p>	<p>UPNG: www.upng.ac.pg</p> <p>PNG University of Technology: www.unitech.ac.pg/</p> <p>University of Goroka: www.uog.ac.pg/</p> <p>Divine World University: http://www.dwu.ac.pg</p> <p>PAU: http://www.pau.ac.pg/</p>	<p>USP: www.usp.ac.fj</p> <p>MES: www.mesc.gov.ws</p> <p>NUS: www.nus.edu.ws</p>	<p>USP: www.usp.ac.fj</p> <p>SINU: http://www.sinu.edu.sb/</p>	<p>USP: www.usp.ac.fj/tongacampus</p> <p>Government of Tonga: www.tongaportal.gov.to</p> <p>TIHE: www.tihe.org/moe</p>	<p>USP www.usp.ac.fj/tuvalucampus</p>	<p>MoET: www.moet.gov.vu</p> <p>Vanuatu Institute of Teacher Education (VITE) www.ifev.edu.vu/about/about.html</p> <p>www.ifev.edu.vu/about/history.html</p> <p>USP: www.vanuatu.usp.ac.fj</p> <p>VIT: vit.edu.vu</p>
Key national priorities or initiatives in ICT in education	<p>Develop or cause to be developed an academic broadband facility for use by higher education institutions.</p> <p>Develop the ICT sector in Fiji and strengthen the country's position as the ICT regional hub.</p> <p>www.fiji.itc.com</p> <p>USPNET: www.usp.ac.fj</p> <p>OLPC</p> <p>MOEHA</p>	<p>National strategy: To deliver a high-quality and relevant school curriculum by the end of 2015.</p> <p>http://planipolis.iiep.unesco.org/upload/Kiribati/Kiribati-ESSP_Education-Sector-Strategic-Plan_2012-15.pdf</p> <p>Outer island strategy: To deliver education to remote islands in a more</p>	<p>Training and education to prepare Nauru's future generations for the challenges ahead.</p> <p>http://www.paddle.usp.ac.fj/collect/paddle/index/assoc/nau006.dir/doc.pdf</p> <p>* Improve literacy and numeracy rates</p> <p>* Improve primary and secondary school attendance</p> <p>* Develop Nauruan-based</p>	<p>Substantial improvement of the telecommunication infrastructure (e.g., Rural Communication Project; http://www.worldbank.org/projects/P107782/rural-communication-project?lang=en)</p> <p>* Develop institutional capacity through training and attachment/study visits</p>	<p>Broadband Internet access by the beginning of 2017; e-government</p> <p>MCIT: www.mcit.gov.ws</p> <p>Compulsory education primary, secondary</p> <p>MESC <i>Strategic Plan 2006-2015</i>: www.mesc.gov.ws</p> <p>* Develop an ODL policy</p> <p>* Create infrastructure</p>	<p>Skills for Economic Growth Programme, with stated goal of strengthening the capacity of tertiary education and training, to produce quality graduates in demand in the labour market, who have the skills and knowledge to increase national productivity</p> <p>MEHRD: www.mehrd.gov.sb</p>	<p>Provide equitable, accessible, relevant and sustainable quality education for all Tongans that will enable Tonga to develop and become a learning and knowledge society.</p> <p>http://planipolis.iiep.unesco.org/upload/Tonga/Tonga_Final-draft_policy_framework_2004-2019.pdf</p> <p>* Develop modules for ICT</p>	<p>Optimise telecommunication services that will in turn spur economic growth and lead to improvements in all sectors, especially education and health, including schools and medical clinics on outer islands</p> <p>* Develop core modules for ICT Teacher Education programme</p> <p>* Build capacity of teachers to use ICT in teaching and</p>	<p>* Universal Access Policy, 98% of population will have access to broadband Internet by the beginning of 2018</p> <p>http://www.trr.vu/attachments/article/390/more_than_300_submissions_to_its_ict_programs.pdf</p> <p>An educated and healthy Vanuatu</p> <p>Vanuatu Education Road Map 2009-2017 http://planipolis</p>

Country	Fiji	Kiribati	Nauru	PNG	Samoa	Sol. Islands	Tonga	Tuvalu	Vanuatu
	<p>Newsletters: http://www.webmedia-staging.com/ntlheritage/?page_id=158</p> <p>https://www.google.com.au/?gfe_rd=cr&ei=mAvtVbmMLqHu8we35rSYBw&gws_rd=ssl#q=One+Laptop+Per+Child+Fiji</p> <p>blog.laptop.org/tag/fiji/</p> <p>PACRICS: http://www.usp.ac.fj/news/story.php?id=1562</p>	<p>effective way. http://www.mfed.gov.ki/sites/default/files/Kiribati-ICT-Policy-Mar-2-2011.pdf</p> <p>* Address the disparate geographic profile of outer islands</p> <p>* Build the capacity of educators as part of the school improvement programme</p> <p>* Increase the English proficiency of primary, junior and senior secondary school teachers through a "surge programme": https://www.col.org/member-countries/kiribati</p> <p>OLPC laptops being recycled: http://www.move.gov.ki/archives/greenlaptopsinkiribati</p> <p>PacRICS http://www.worldbank.org/en/results/2012/08/02/kiribati-</p>	<p>curriculum with programmes in life skills, culture, language, TVET, and traditional subject areas (e.g., English, Maths, Science and Social Sciences)</p> <p>https://www.col.org/member-countries/nauru</p> <p>USPNET: www.usp.ac.fj/naurucampus</p>	<p>* Develop a policy framework for teacher training through ODL</p> <p>* Develop in-country capacity for ICT-enhanced learning</p> <p>* Promote OER and in-country collaboration for content development</p> <p>* Support the establishment of the Papua New Guinea Open University, https://www.col.org/member-countries/papua-new-guinea</p> <p>UPNG: www.upng.ac.pg</p> <p>OLPC Divine World University: http://www.dwu.ac.pg</p> <p>PacRICS: www.ptc.org/ptc11/images/papers/upload/Smith_Daniel_PPT.pdf</p>	<p>(such as SNBH and SchoolNet) to reach all schools and secure sustainable connectivity</p> <p>* Build capacity to produce both online and offline materials which are affordable or free</p> <p>* Establish eLearning programmes for vocational and lifelong education opportunities for youths and adults</p> <p>* Establish a support unit to provide pedagogical and technical support to teachers using ICT in the curriculum delivery</p> <p>* Develop core modules and training for teacher use of ICT for teaching and student learning</p> <p>* In health sciences, develop online methods for course delivery</p>	<p>* Support basic education, including education for out-of-school youths and those with disabilities</p> <p>* Include practical subjects, TVET courses and ICT knowledge in junior secondary school curriculum</p> <p>* Revise senior secondary school curriculum</p> <p>* Develop new programmes and modules, such as computing studies, for training centres https://www.col.org/member-countries/solomon-islands</p> <p>USPNET: www.usp.ac.fj</p> <p>SINU: http://www.sinu.edu.sb/</p>	<p>teacher education to be delivered to untrained graduate teachers in the outer islands and main district areas</p> <p>* Train teachers to develop online materials at higher education levels</p> <p>* Build capacity to upskill teachers in using ICT in teaching and learning</p> <p>* Establish new physical infrastructure in the Tonga Institute of Higher Education to provide technical support to train teachers to use ICT and to deliver TVET curriculum programme https://www.col.org/member-countries/tonga</p> <p>USPNET: www.usp.ac.fj</p> <p>Initiatives include most recent through</p>	<p>learning</p> <p>* Develop modules in selected learning programmes for TVET to be delivered through flexible mode</p> <p>* Train teachers in developing online materials at various levels</p> <p>* Support Education Department (Supervisory Unit) to provide pedagogical and technical support to teachers using ICT in curriculum delivery https://www.col.org/member-countries/tuvalu</p> <p>USPNET: www.usp.ac.fj</p> <p>Pilot eLearning project to three primary schools</p>	<p>.iiep.unesco.org/upload/Vanuatu/Vanuatu_Education_Road_Map_2009.pdf</p> <p>Vanuatu Education Sector Programme Design Document (October 2012)</p> <p>Increase awareness of what COL is providing and work with COL to be able to tap into resources for training https://www.col.org/member-countries/vanuatu</p> <p>USPNET: www.usp.ac.fj</p>

Country	Fiji	Kiribati	Nauru	PNG	Samoa	Sol. Islands	Tonga	Tuvalu	Vanuatu
		telecommunications-and-ict-development-project USPNET: www.usp.ac.fj			in biomedical sciences and specialty areas https://www.col.org/member-countries/samoa SchoolNet project: schoolnet@mes.c.gov.ws USPNET: www.usp.ac.fj		USP Tonga Connected to the fibre-optic cable in 2014, four schools now linked to this connection TIHE: www.tihe.org Community development programmes using IT to enable, enhance and support learning		
Key ministries and institutions	MoEHA: http://www.education.gov.fj/index.php/services/policies Ministry of Communication –Department of Information: www.itc.gov.fj FHEC: http://www.education.gov.fj/index.php/services/policies FNU: www.fnu.ac.fj UoF: www.unifiji.ac.fj USP Laucala campus: www.usp.ac.fj USP Lautoka campus:	MoET: www.mfed.gov.ki MOE Technology division: http://www.moe.gov.ki/divisions/technology-support-and-information-management Telecom services: www.fosigrid.org/oceania/kiribati USP Kiribati campus: www.usp.ac.fj/kiribaticampus	Department of Education: www.naurugov.nr USP Nauru campus: www.usp.ac.fj/naurucampus	PNG Department of Education: http://www.education.gov.pg/QL/plan/png-2050 http://www.education.gov.pg/Home/index/html http://www.planiapolis.iiep.unesco.org/papua/20%New/20%Guinea/Papua New Guinea/UBE 2010-2019.pdf NICTA: www.nicta.gov.pg http://www.acma.gov.au/webwr/_assets/main/lib312019/4.%20plenary;%20session%2	MESC: www.mesc.gov.ws MCIT: www.mcit.gov.ws USP Samoa: www.usp.ac.fj/alafua NUS: www.nus.edu.ws	MEHRD: www.mehrd.gov.sb USP Solomon Islands: www.usp.ac.fj/solomoncampus SINU: http://www.sinu.edu.sb/ JCPU: http://www.acom.org.sb/ministries/education/john-coleridge-patterson-university UPNG Open Campus: http://www.upng.ac.pg/index.php/open-college Goroka University Open Campus:	MIC: www.mic.gov.to MOET: http://www.tongaeducation.gov.to/ USP Tonga: www.usp.ac.fj/tongacampus TIHE: www.tihe.org/moe	TTC: www.En.wikipedia.org/wiki/Tuvalu MEYS: http://www.spc.int/prism/images/EducationDigests/TUVALU/Tuvalu%20Statistics%20Digest%202012.pdf USP Tuvalu: www.usp.ac.fj/tuvalucampus	MoET: www.moet.gov.vu Vanuatu Institute of Teacher Education: www.ifev.edu.vu/about/about.html www.ifev.edu.vu/about/history.html USP Vanuatu: www.vanuatu.usp.ac.fj

Country	Fiji	Kiribati	Nauru	PNG	Samoa	Sol. Islands	Tonga	Tuvalu	Vanuatu
	www.usp.ac.fj/l autokacampus USP Labasa campus: www.usp.ac.fj/l abasacampus			0focussing%20 on%20needs% 20of%20asia- pacific%20%28 une%20o'omi% 20nicta%29.pdf		http://edunews png.com/2014/ 05/uog-opens- center-in-the- solomon- islands/			
Est. number of students enrolled annually in media and ICT courses	N/A	N/A	N/A	N/A	N/A	Tertiary: 100	N/A	N/A	N/A
Est. number of teachers to be trained in TEL in the next six years	N/A	N/A	N/A	N/A	N/A	24	N/A	N/A	N/A

N = no

N/A = information not available

Y = yes

Appendix 3: ICT Data – Penetration Rate

Country	Fixed telephone subscriptions per 100 inhabitants	Mobile cellular subscriptions per 100 inhabitants	Fixed (wired) broadband subscriptions per 100 inhabitants	Mobile broadband subscriptions per 100 inhabitants	Households with a computer (%)	Households with Internet access at home (%)	Individuals using the Internet (%)
Fiji	8.5	101.1	1.2	53.5	34.2	26.7	37.1
Kiribati	8.8	16.6	1.1	0	6	2.5	11.5
Nauru	0	67.8	0	10	18	28	54
PNG	1.9	41	0.2	0	3.4	2.9	6.5
Samoa	10.8	47.2	0.1	0	N/A	N/A	15.3
Solomon Islands	1.4	57.6	0.3	8	5.5	4.2	8
Tonga	29.4	54.6	1.6	0.1	15.5	12	35
Tuvalu	14.7	34.4	7.1	0	23.4	19.7	37
Vanuatu	2	59.3	0.1	7.4	11.2	3.5	11.3

Sources:

Secretariat of the CROP ICT Working Group (2015), p. 28

ITU Statistics: <http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx>

N/A = information not available

Appendix 4: ICT and Human Capacity Building

Country	Secondary schools have access to computers	Secondary schools have Internet access	ICT curriculum included in teacher training
Fiji	Y	Y	Y
Kiribati	Y	Y	N
Nauru	Y	Y	N
PNG	Y	Y	N/A
Samoa	Y	Y	N/A
Solomon Islands	Y	Y	N
Tonga	Y	Y	N/A
Tuvalu	Y	Y	N
Vanuatu	Y	Y	N

Sources:

Secretariat of the CROP ICT Working Group (2015), Table 3.6, p. 20

ITU Statistics: <http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx>

N/A = information not available

Appendix 5: National ICT Policies

Country	National ICT policies	Cybercrime legislation	Regional strategy to combat cybercrime	Electronic files admissible in court	Data protection legislation	ICT in education policy	ICT in health policy
Fiji	Y	Y	N/A	N/A	N	Y	Y
Kiribati	Y	N	N/A	N	N	N	N
Nauru	N	N	N/A	N/A	N	Y	N/A
PNG	Y	N	N/A	N/A	N	Y	N/A
Samoa	Y	Y	N/A	N/A	N	Y	N/A
Solomon Islands	N	N	N/A	N	N	N	N
Tonga	Y	Y	N/A	Y	Y	Y	N/A
Tuvalu	N	N	N/A	N	N	N	N
Vanuatu	Y	Y	N/A	N/A	N	Y	N/A

Sources:

Secretariat of the CROP ICT Working Group (2015), Table 2.6, p. 16

ITU Statistics: <http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx>

N/A = information not available