

Topic

Access to ICT infrastructure and devices in the South Pacific

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Sub-Theme: Inspiring Innovations (Attendance: In person)

Special focus area: Emerging technologies for education and training

Keywords: Information and Communications Technology; Open, Flexible and Distance Learning; Education and Development.

Abstract

The South Pacific region spreads over more than 30 million square kilometres of the Pacific Ocean. The region comprises more than a dozen island nations ranging from small volcanic islands to even smaller coral atolls. Population masses in the island nations vary from around 2,000 in Tokelau to a little more than 800,000 in the Republic of Fiji. Access to information and communications technologies and internet connectivity in the region is varied. This project involves the design and conduct of a desktop study into access to ICT infrastructure, connectivity and devices and their use by students and teachers in the Pacific. Outcomes of this study will enable COL to make informed decisions about what access and delivery technologies to employ in the *Partnership for Open, Distance and Flexible Learning project in the Pacific*. The study will address issues of access to hardware, software, connectivity and skills, as well as examples of ways in which teachers, institutions or Ministries have found ways to address the challenges in low bandwidth/limited access environments, especially in the nine developing countries of the Commonwealth in the region.

ICT Affordances for learning and teaching

Information and communications technologies (ICT), unlike the conventional printed material, have the potential to capture, store and deliver information to learners and teachers in a variety of formats. These include the integration of text with audio, video and animation (see Naidu, 2008; 2010). In addition, with ICT it is possible to design for more active engagement and provide immediate automated formative feedback on learning. Ethically sound use of learning analytics also provides information for individualised support. Not only do ICTs offer greater capabilities and a wider range of possibilities for the presentation of content they have greater storage capacity as well. Much larger amounts of information and various types of content can be stored using contemporary ICTs, than has been possible using conventional media (see Greenhow, Robelia, & Hughes, 2009). This information can be easily accessed and more readily updated, which is useful in maintaining its currency.

A further unique feature of contemporary ICTs is their ability to support both synchronous and asynchronous communication. This is especially critical for distance learners who are separated in time and place from their teachers, tutors and educational organization. But opportunities for communication and collaboration are not uniquely important for distance learners alone. Full-time students in campus-based educational settings also appreciate the possibilities that these attributes of ICTs afford. Teachers also find these attributes increasingly valuable in supporting their teaching strategies such as collaborative group work activities among their students.

There is also now a substantial body of experience and literature which points to the role of online synchronous and asynchronous communication tools for building and promoting learning communities and communities of practice (see Wenger, 1998, 2007; Wenger, McDermott, & Snyder, 2002). These attributes of ICTs can be organised and harnessed in a variety of ways and combinations to support learning and teaching formats. They include self-paced learning online and offline, and group-based learning synchronously and asynchronously (see Naidu, 2008; 2010). These modes of engagement and interaction oftentimes will also overlap and co-exist (see Figure 1). Many of these learning and teaching opportunities are simply not possible in conventional campus-based learning arrangements, with large numbers and in distributed or distance education settings.

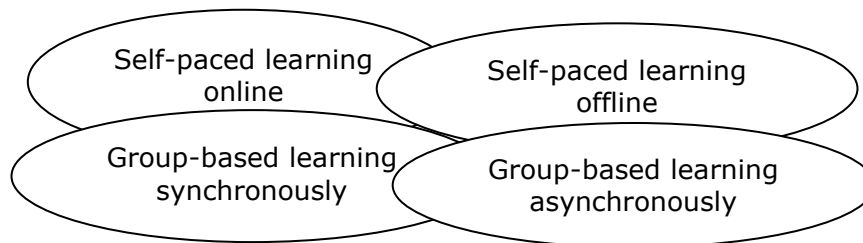


Figure 1: Modes of engagement and interaction with ICT

Self-paced learning offline is possible with the help of PDAs, and laptop computers which enable learners to readily access and use large amounts of information and rich data at their own time, place and pace, a lot more than what is possible via a printed resource. *Self-paced learning online* is possible with the help of a range of technologies and networked resources such as online databases and the Web. These technologies allow users to engage and interact with subject matter content in a variety of ways and also at a pace that is convenient for individuals (see Naidu, 2008; 2010).

The dynamics of learning are altered considerably when learners are able to work in groups collaboratively. A wide range of technologies is becoming increasingly available to support group-based collaborative learning synchronously as well as asynchronously. *Group-based learning* in real time is possible with a range of audio, videoconferencing, and audio-graphic technologies, and i-labs which facilitate remote control of laboratories over the Internet. *Asynchronous group-based learning* is possible through a plethora of online learning environments, discussion forums and Web 2.0 technologies which enable learners to work together from a place and time, and at a pace that is convenient for them (see Greenhow, Robelia, & Hughes, 2009; Naidu, 2008; 2010).

Research Questions

To be able to leverage off these affordances of technologies, access to a range of ICTs is required, and here lies the challenge for the Pacific. There is a lack of comprehensive data on access to ICTs and its use in the Pacific region, which affects decision making about what needs to be done, where and when. This study seeks to address that deficit. It will benchmark *access to ICT* and *its use* in the South Pacific so that shifts in ICT access and use can be monitored over time.

The goal of this study has been to collect data along the following lines:

1. Demography (Gender, Residence Rural/Urban; Employment status/Student).
2. Device Access (Access to, as well as Ownership of ICTs including mobile devices).
3. Use of ICT (How are ICTs currently being used by people).
4. Level of access to the Internet and Connectivity.
5. Adequacy of access to the Internet and Connectivity.
6. Level of competence with ICT and Connectivity.
7. Level of experience in the use of ICT and the Internet.
8. Satisfaction with the access to ICT and connectivity.

Research Methodology

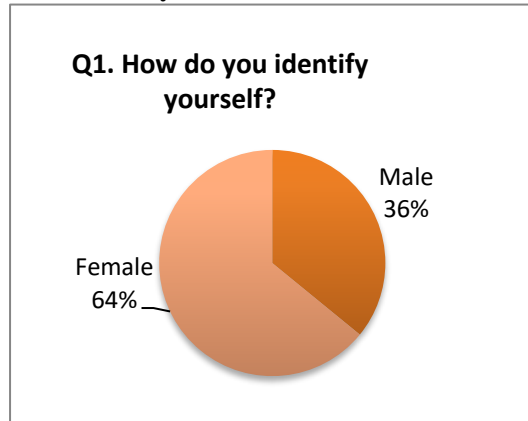
A mixed methods approach was adopted in the conduct of this study. This comprised the use of an online survey and focus group interviews for the collection of both quantitative and qualitative data. Additional country specific data was also sourced from data warehouses.

The online survey (see Appendix 1) consisted of 13 questions. These covered demographic information on respondents, device access and ownership, experience with and use of ICT, perceptions of and satisfaction with ICT, and costs of ICT in relation to income and expenditure.

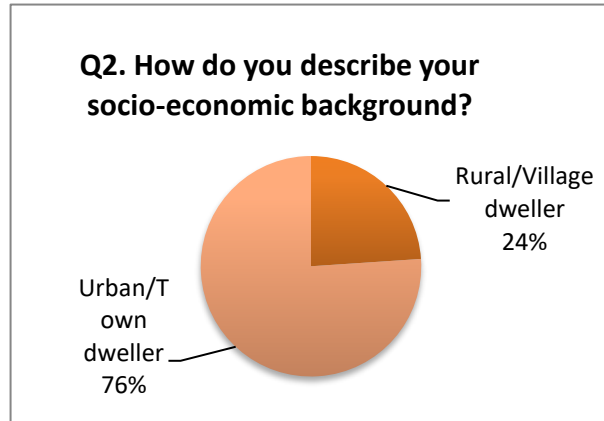
Results

Data from both the online survey is presented in the following.

Online Survey Data

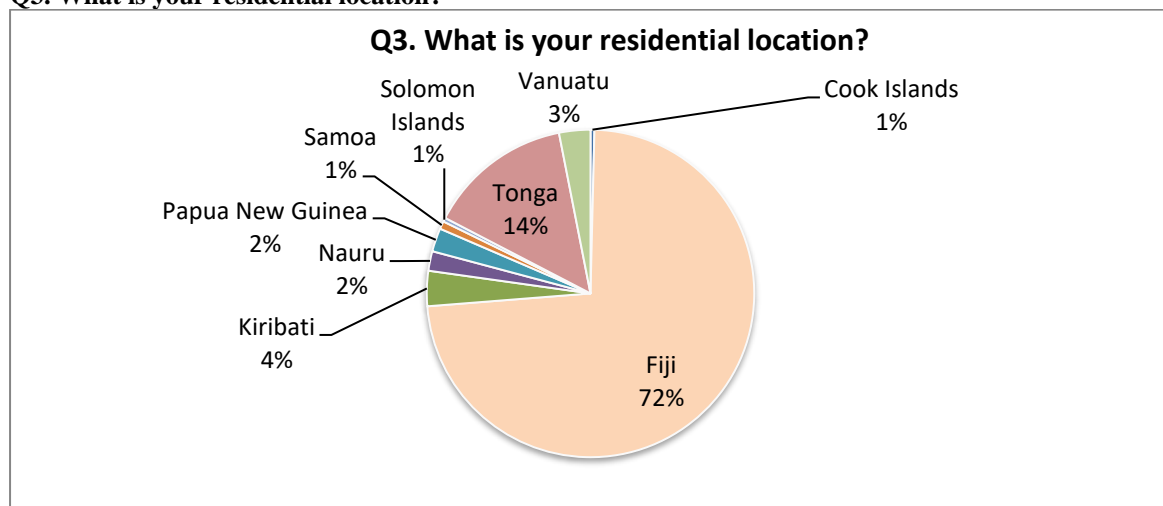


241 responses



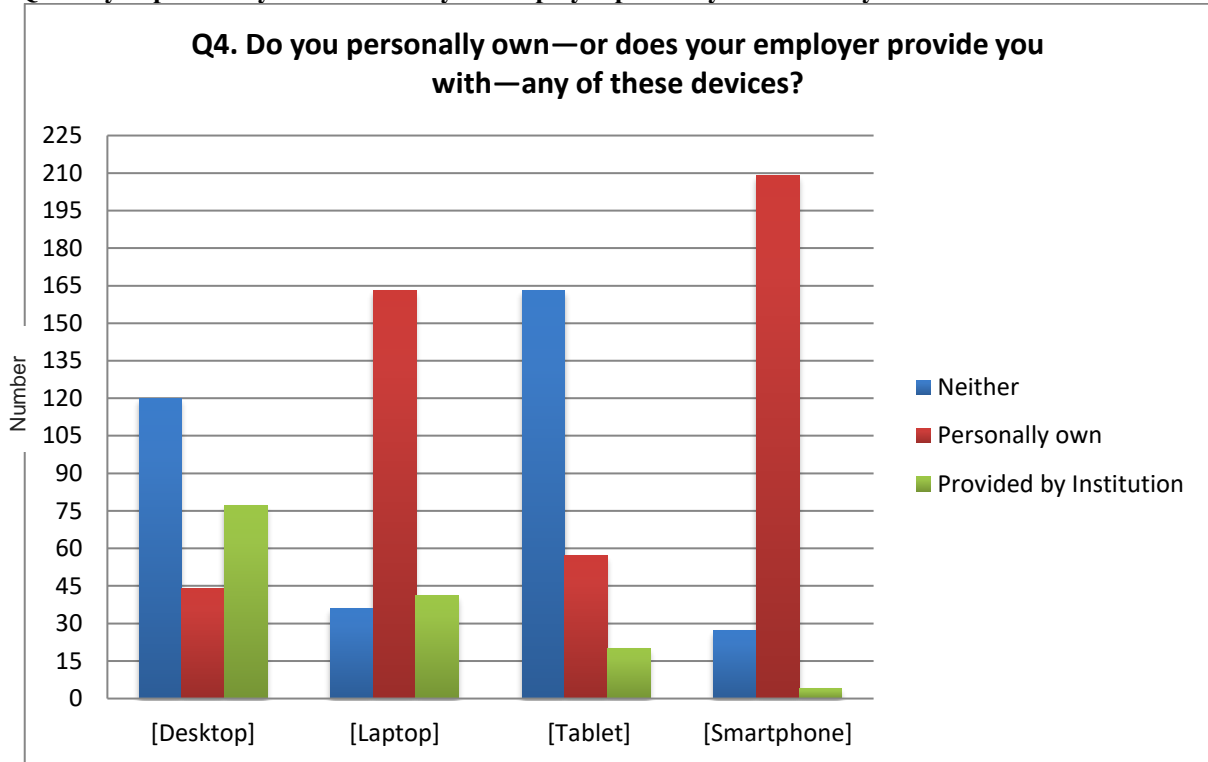
241 responses

Q3. What is your residential location?



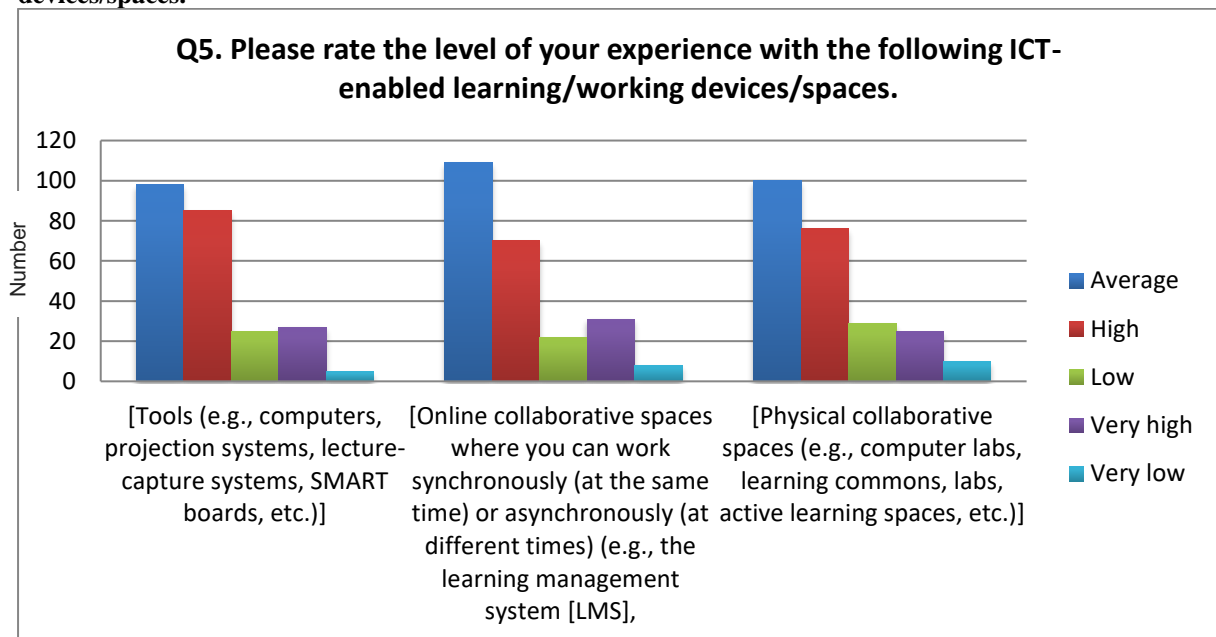
241 responses

Q4. Do you personally own—or does your employer provide you with—any of these devices?



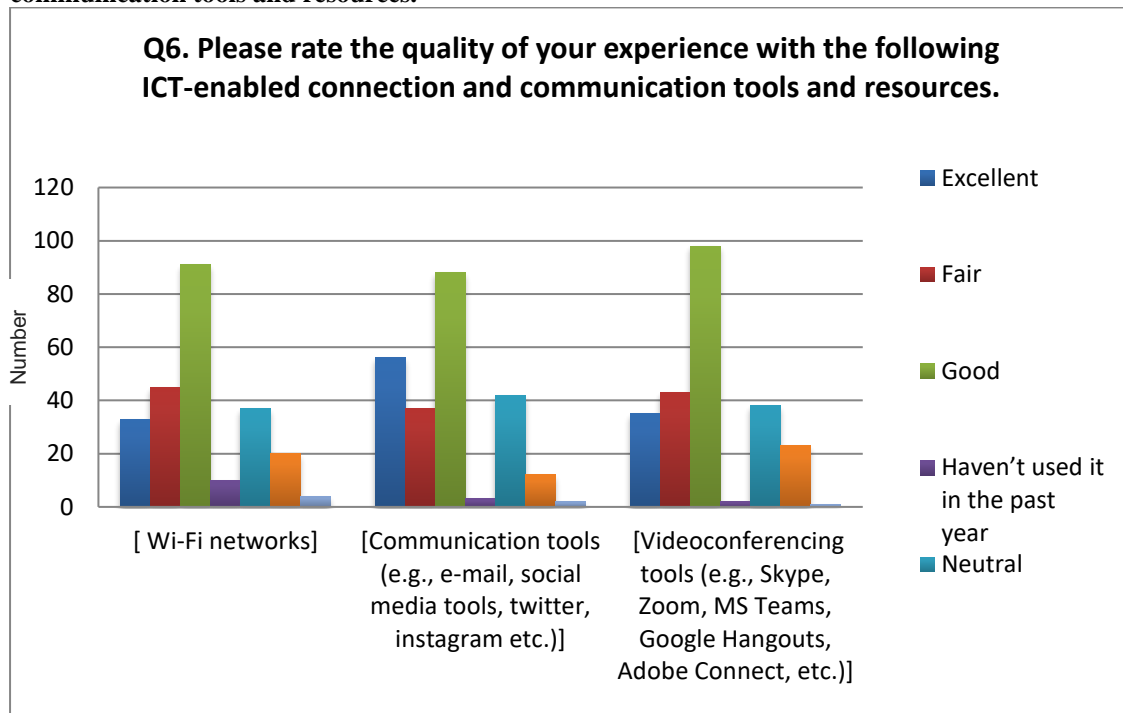
241 responses

Q5. Please rate the level of your experience with the following ICT-enabled learning/working devices/spaces.



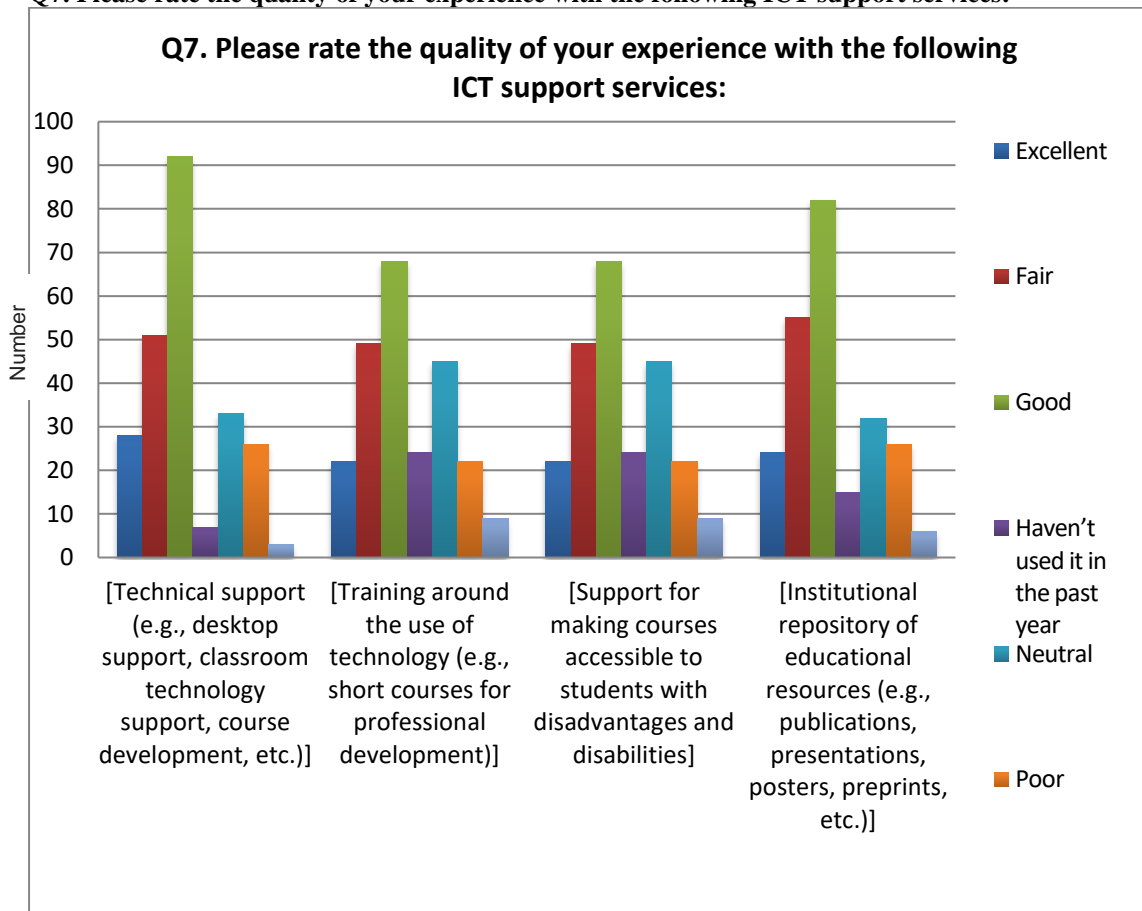
241 responses

Q6. Please rate the quality of your experience with the following ICT-enabled connection and communication tools and resources.



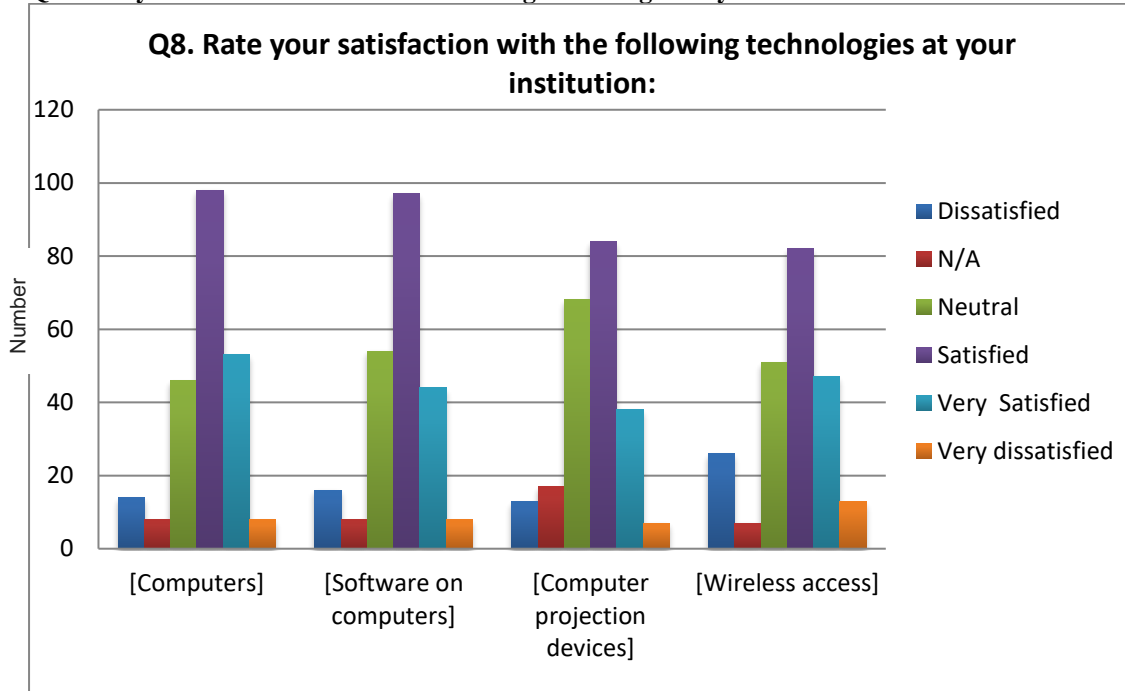
241 responses

Q7. Please rate the quality of your experience with the following ICT support services:



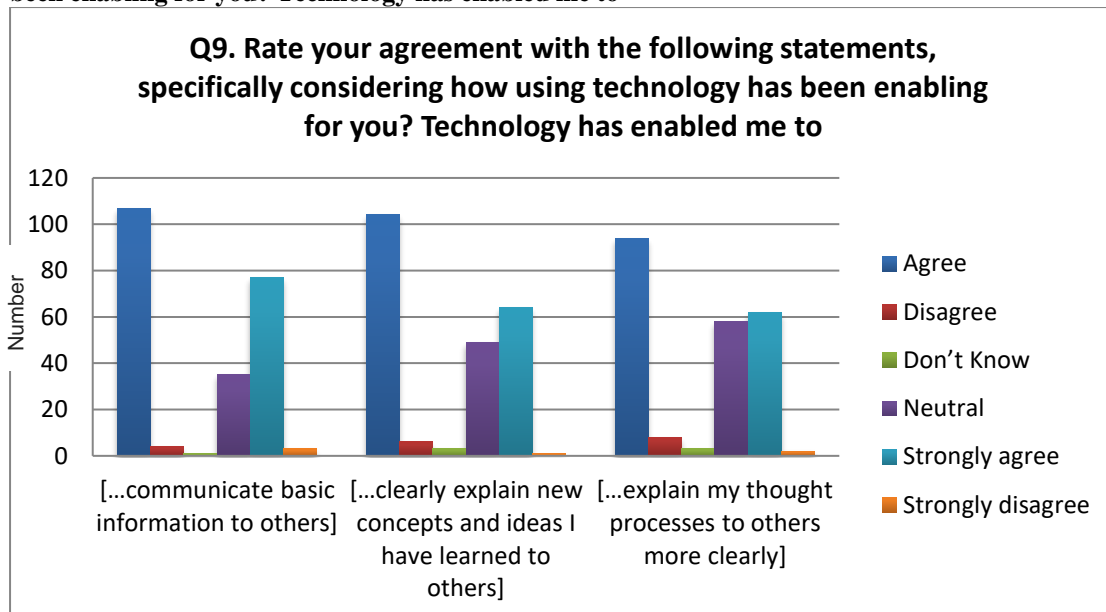
241 responses

Q8. Rate your satisfaction with the following technologies at your institution:



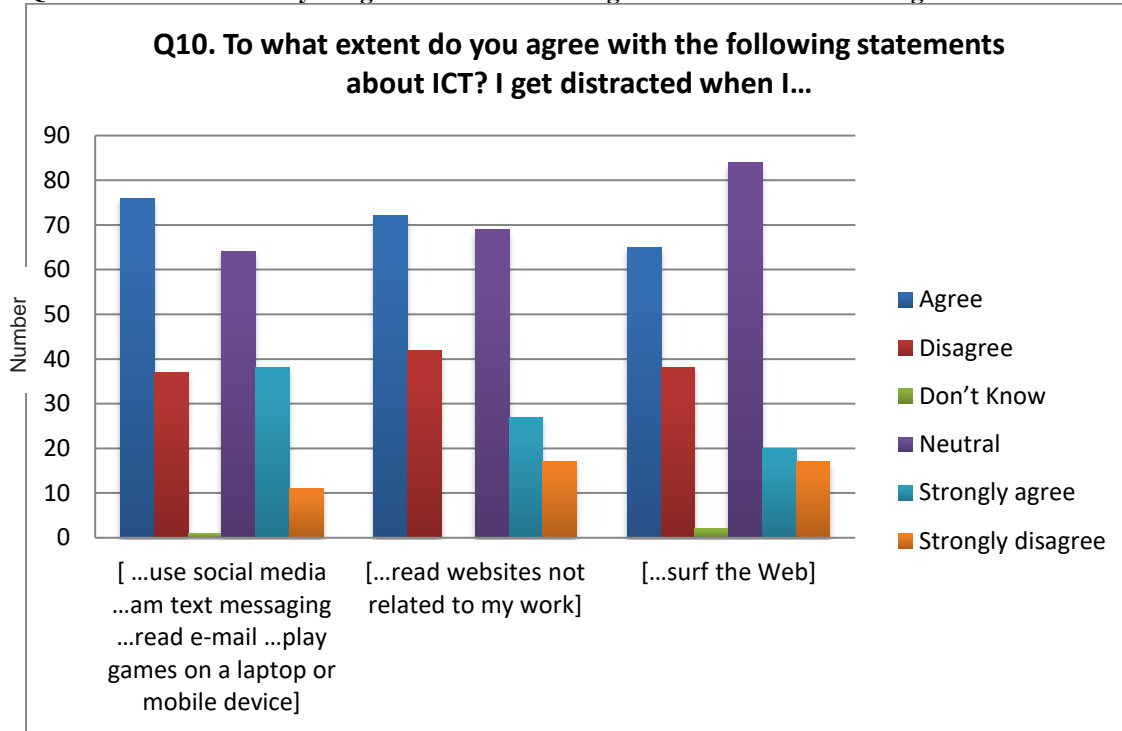
241 responses

Q9. Rate your agreement with the following statements, specifically considering how using technology has been enabling for you? Technology has enabled me to



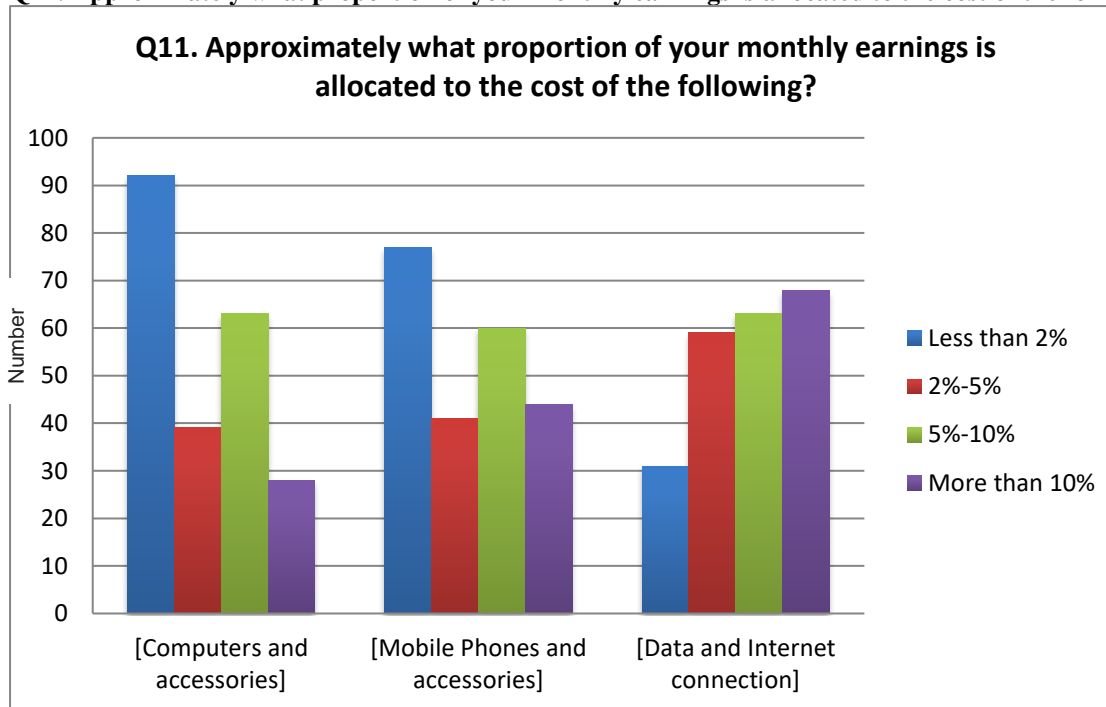
241 responses

Q10. To what extent do you agree with the following statements about ICT? I get distracted when I...



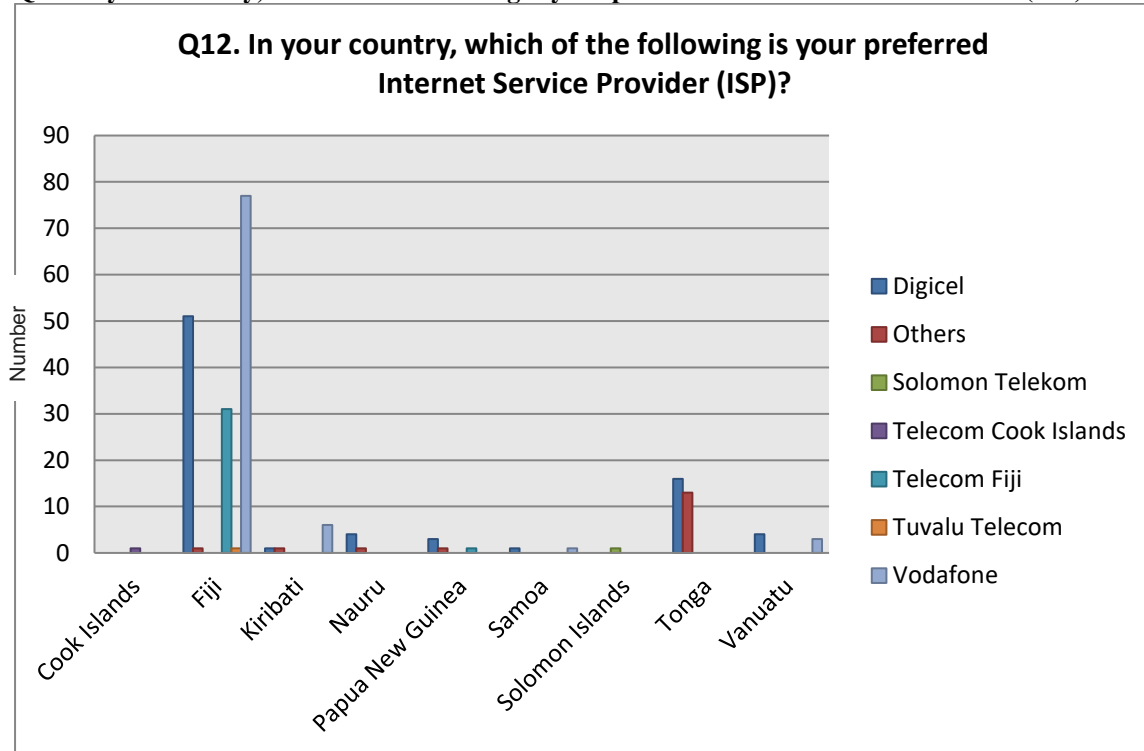
241 responses

Q11. Approximately what proportion of your monthly earnings is allocated to the cost of the following?



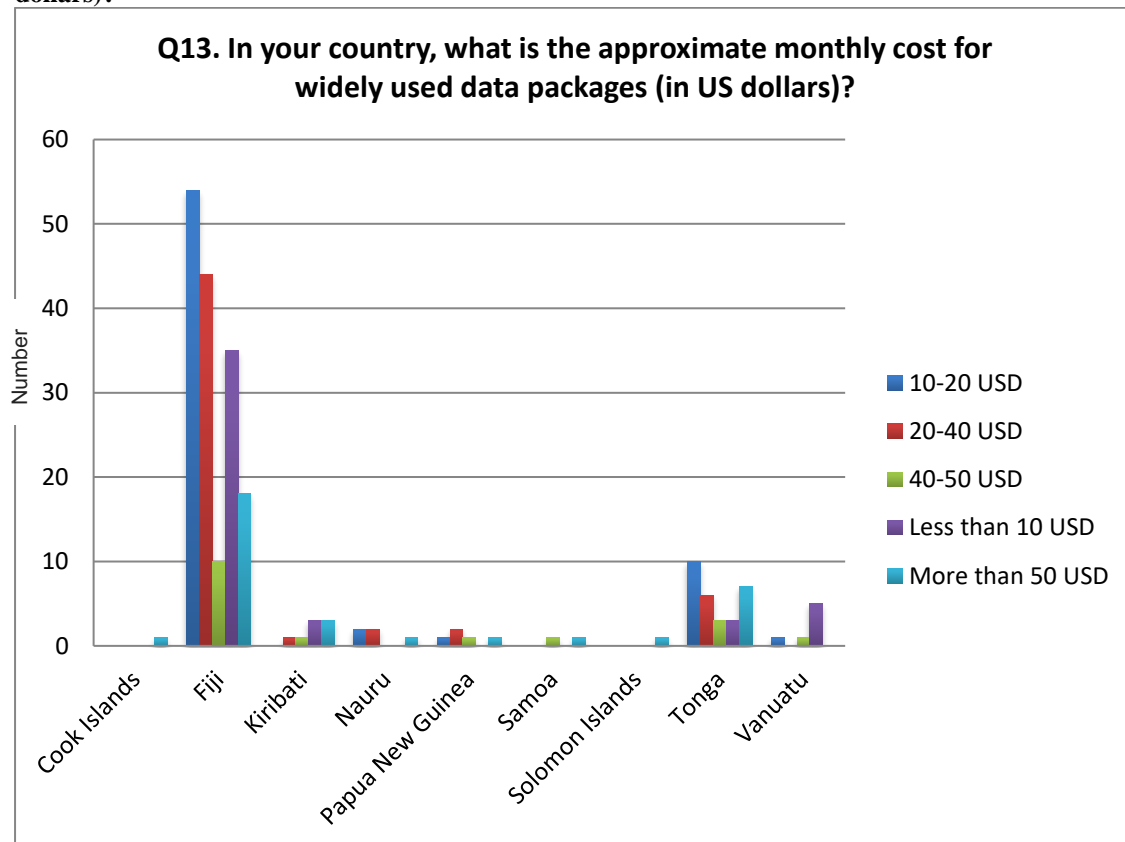
241 responses

Q12. In your country, which of the following is your preferred Internet Service Provider (ISP)?



241 responses

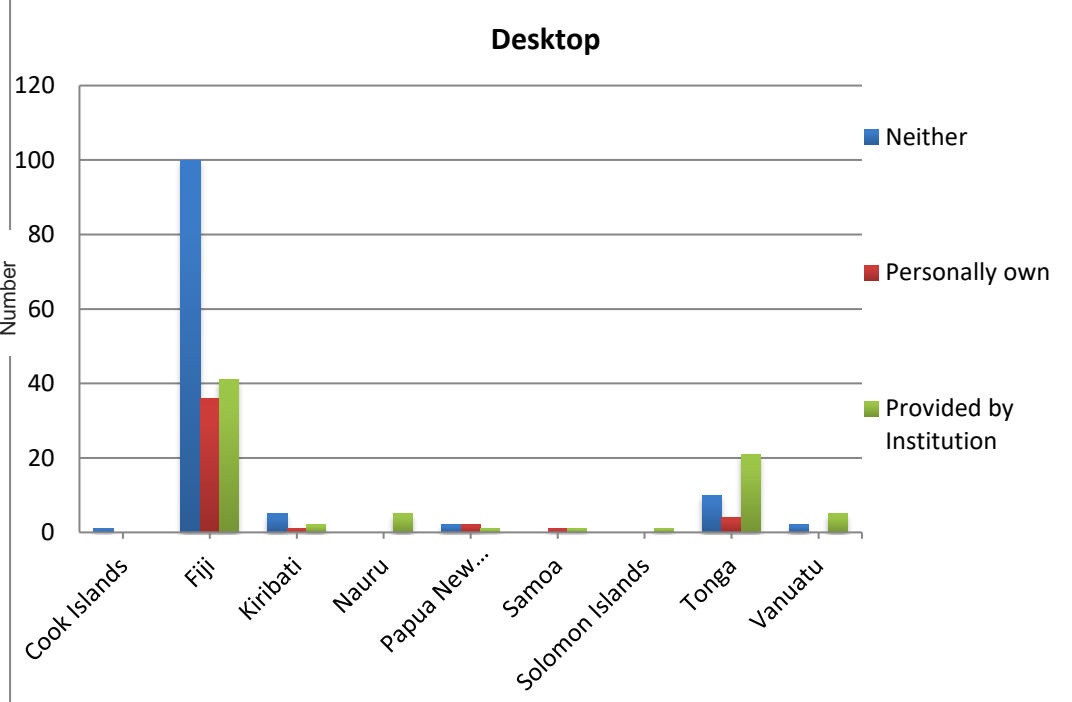
Q13. In your country, what is the approximate monthly cost for widely used data packages (in US dollars)?



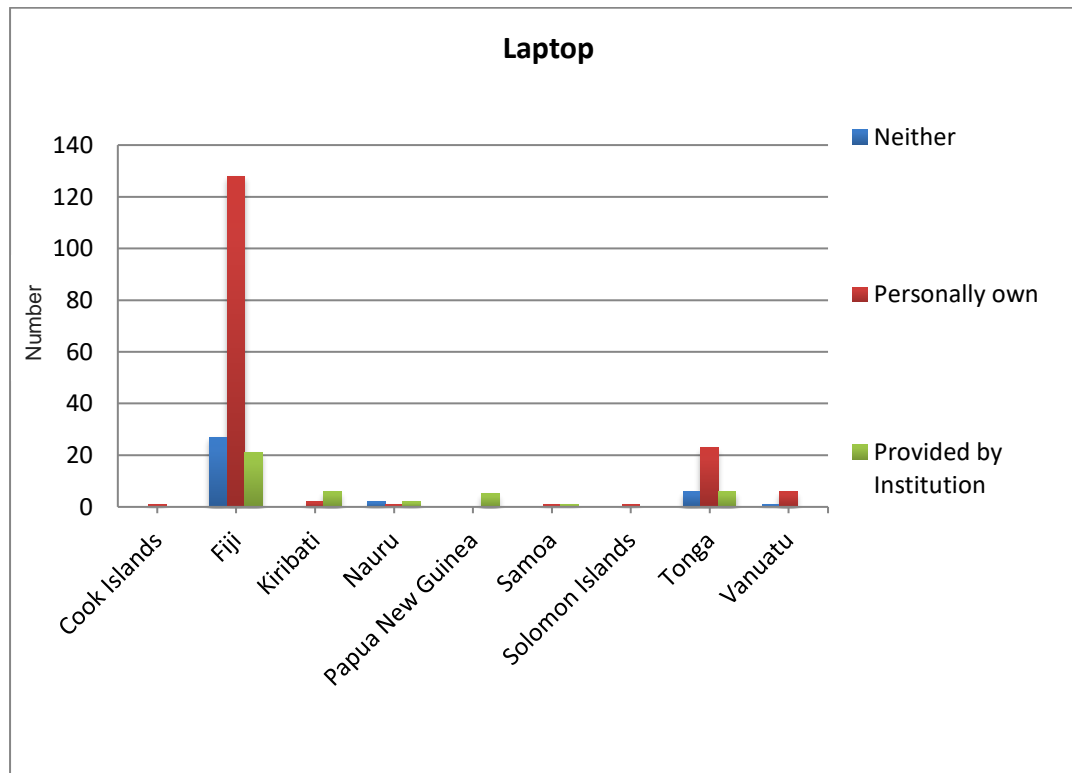
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Online Survey Data Disaggregated by Country

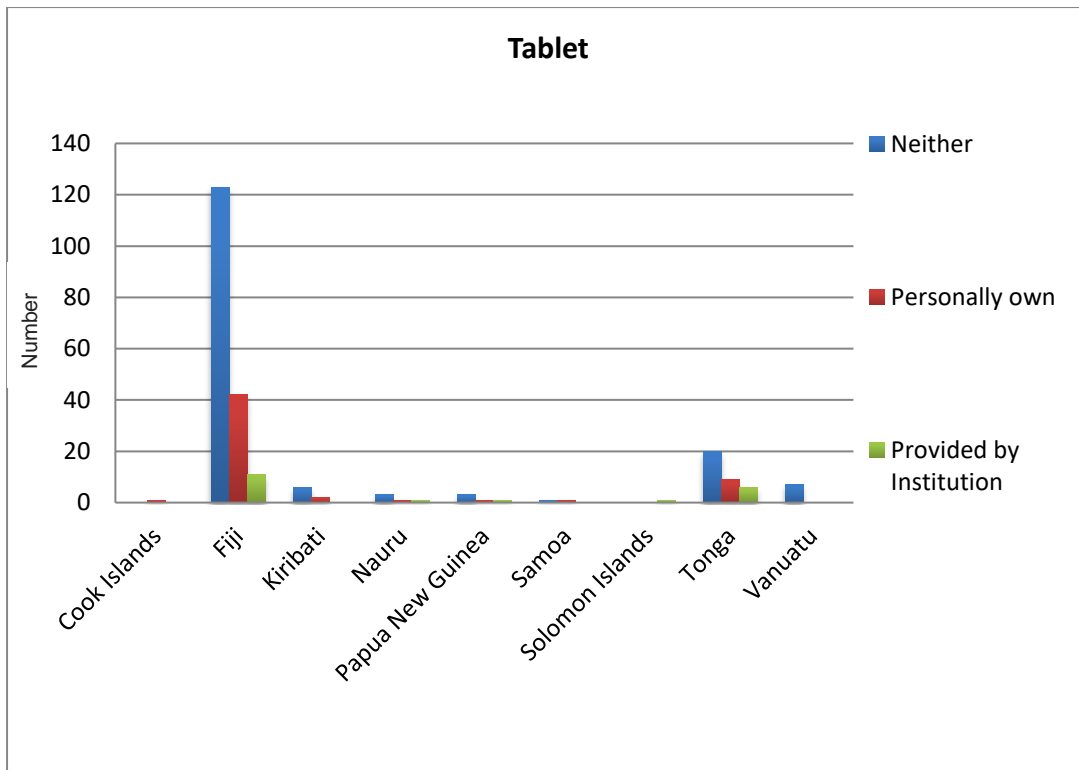
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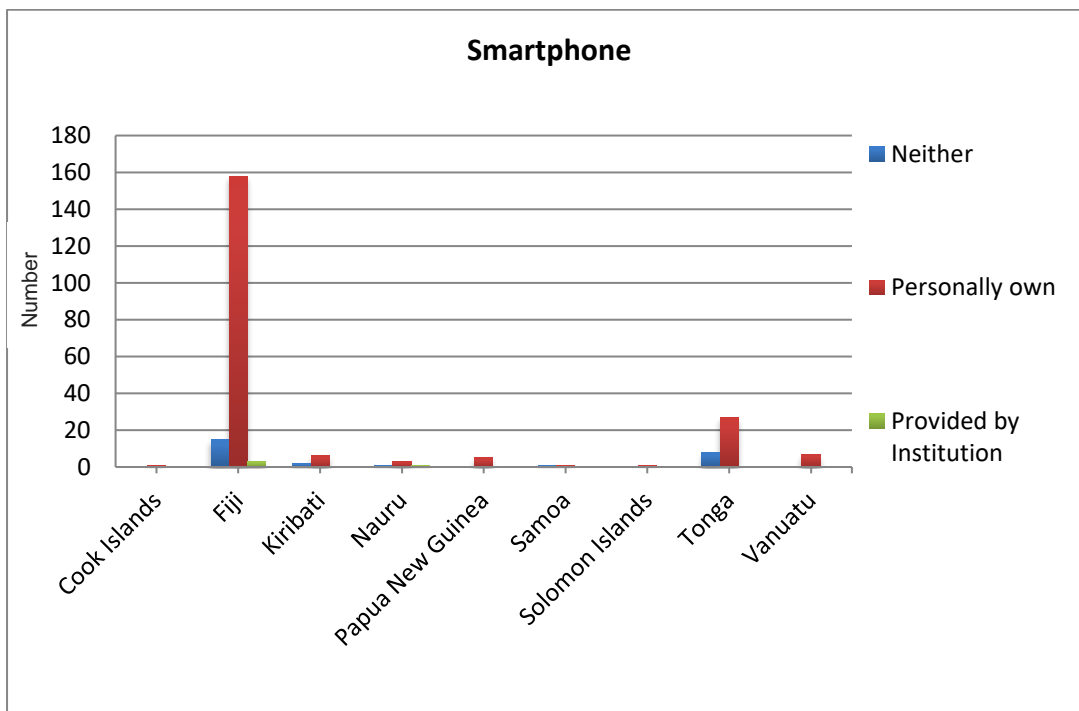
241 responses



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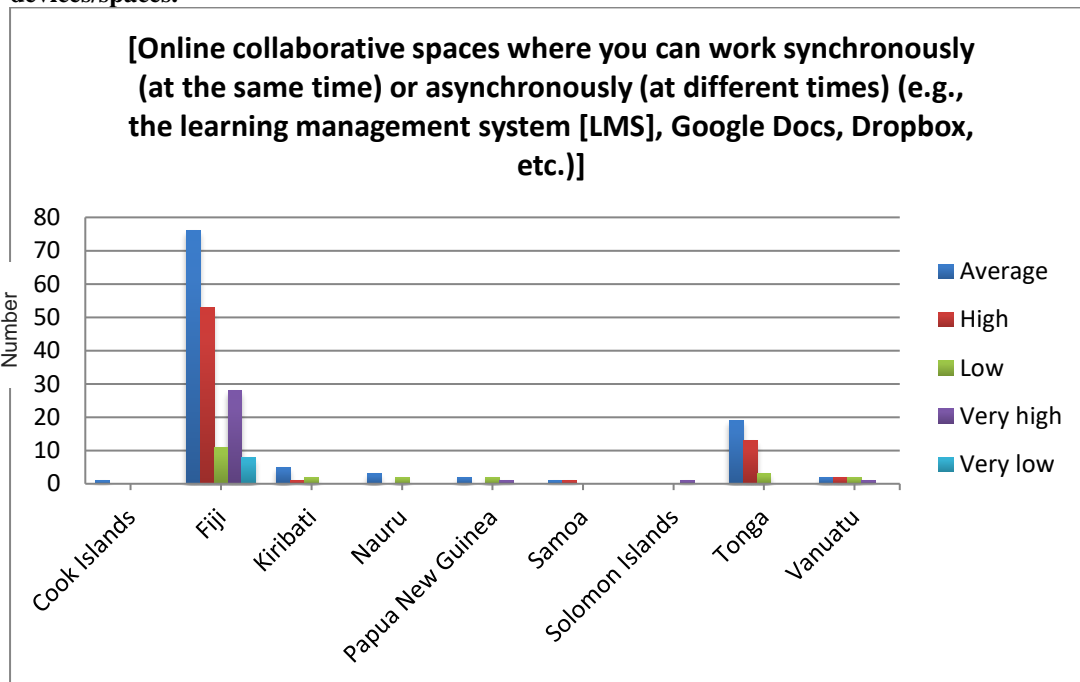


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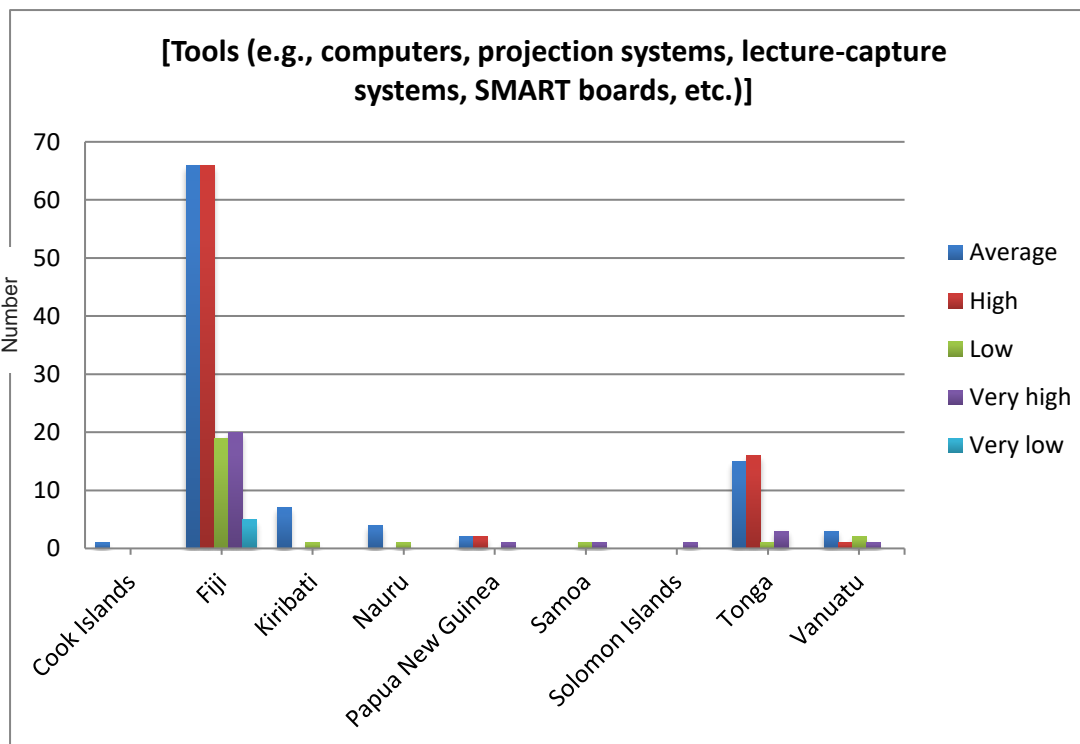


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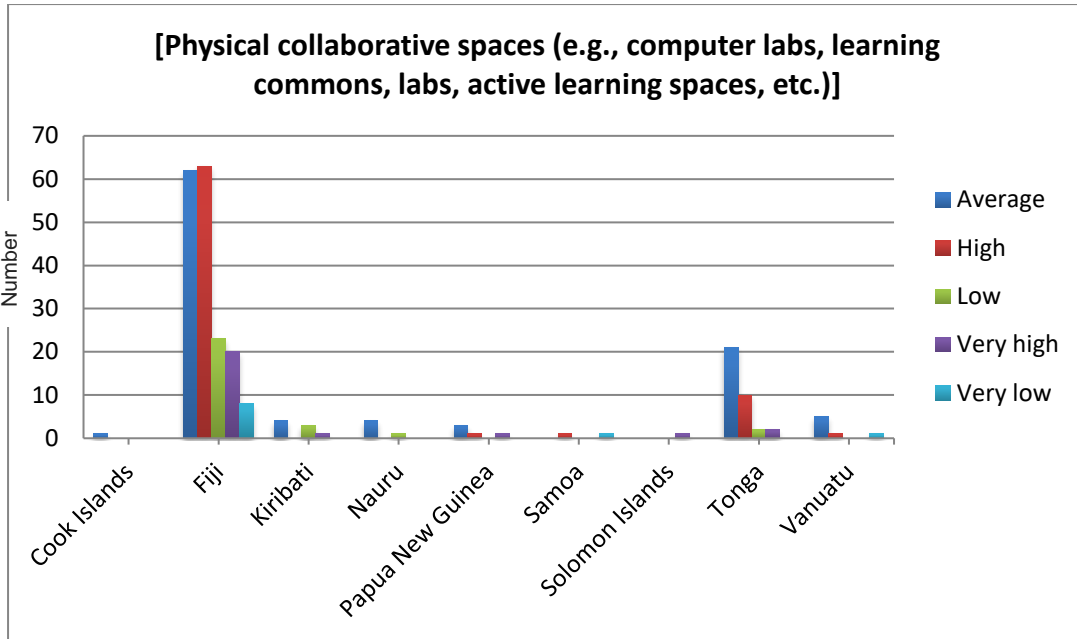
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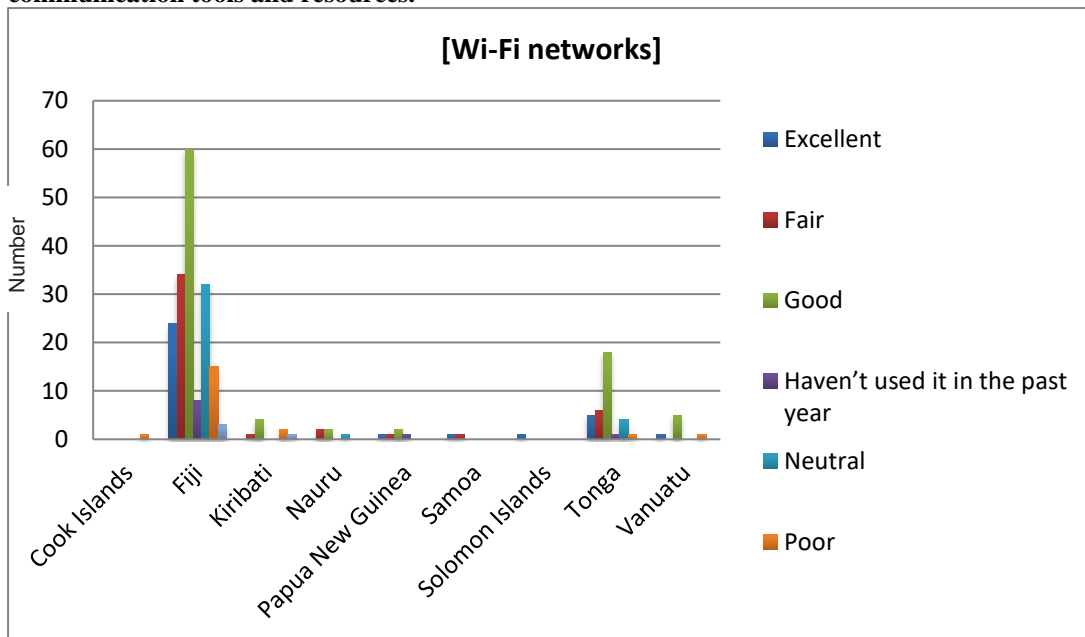


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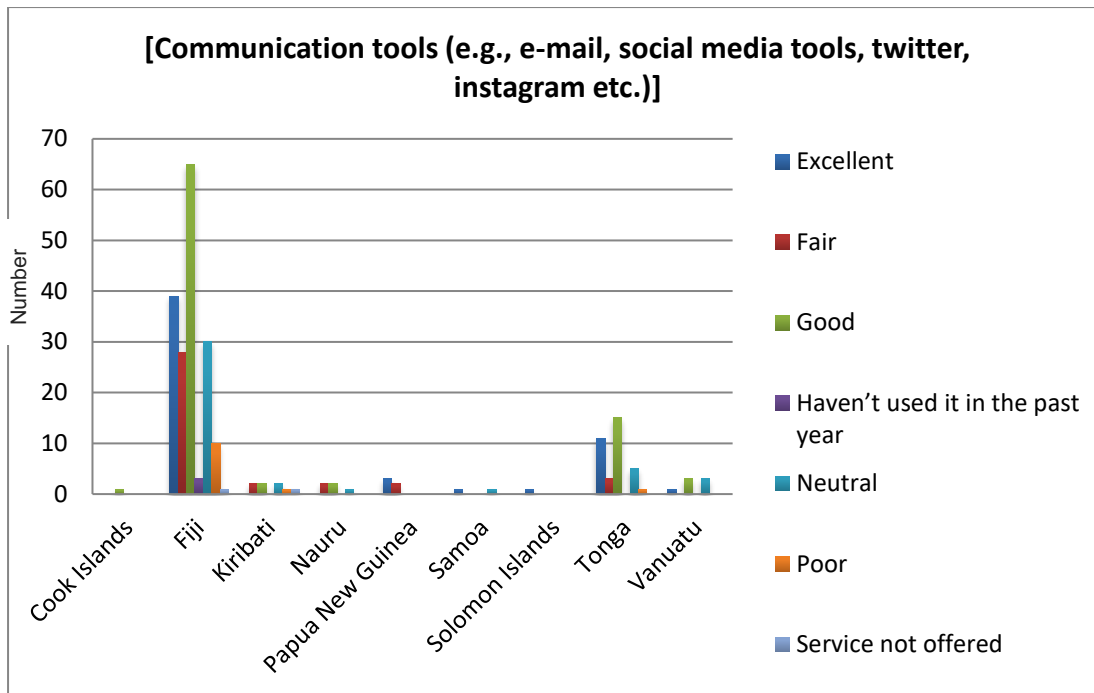


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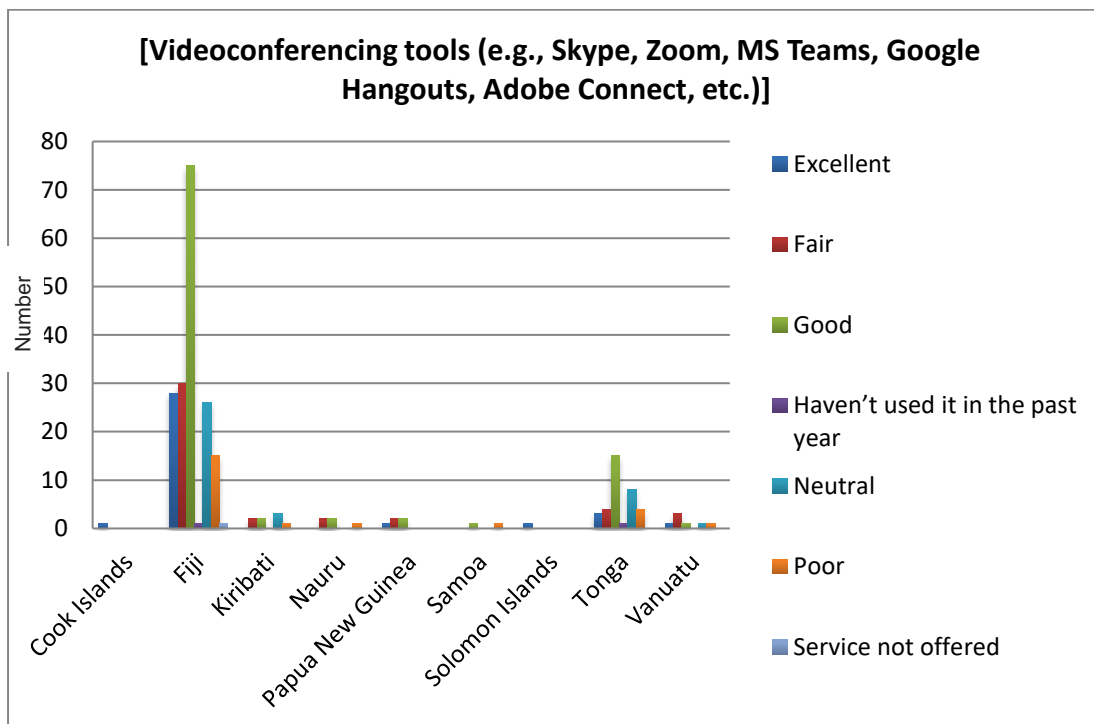
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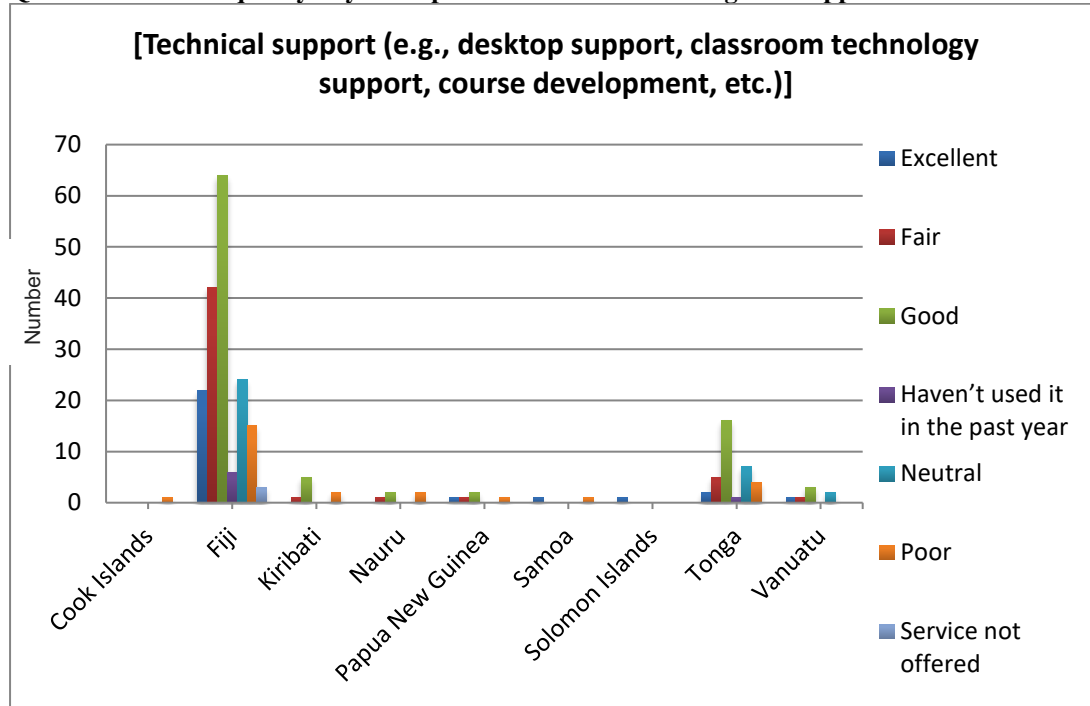


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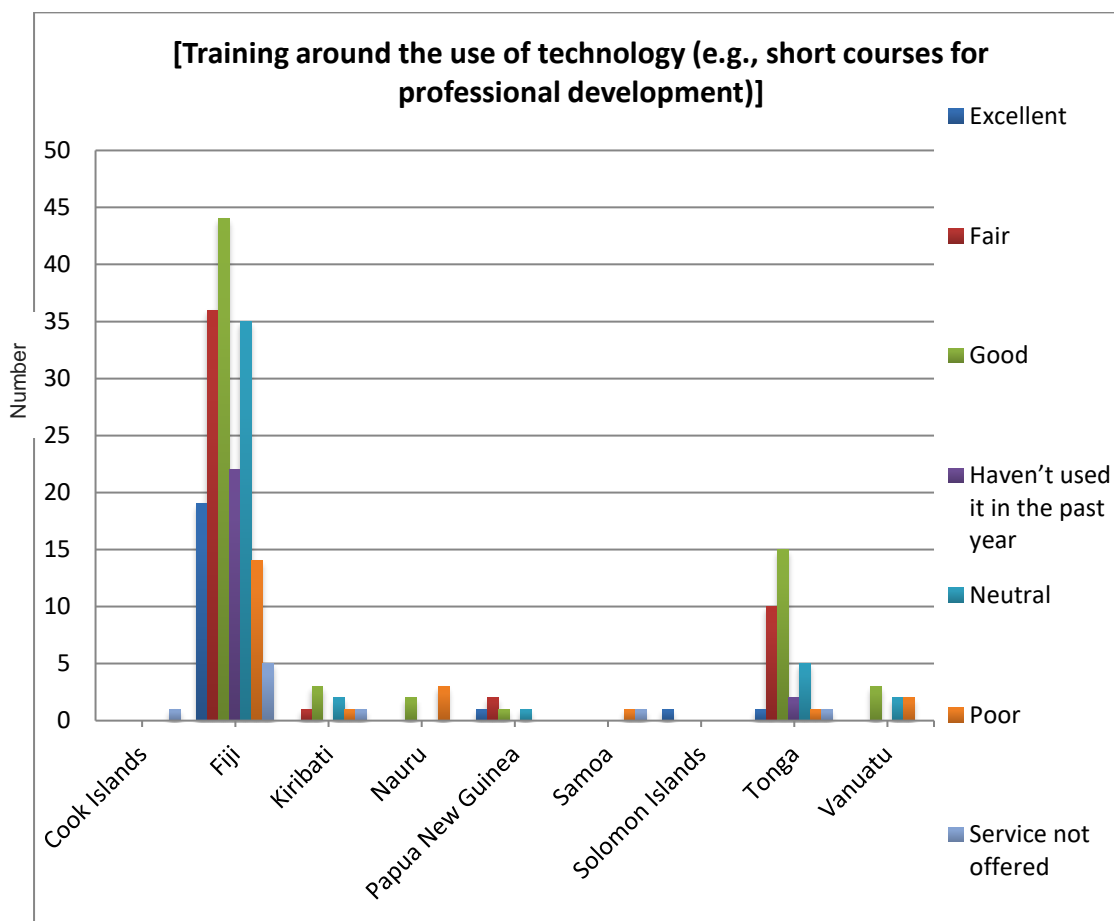


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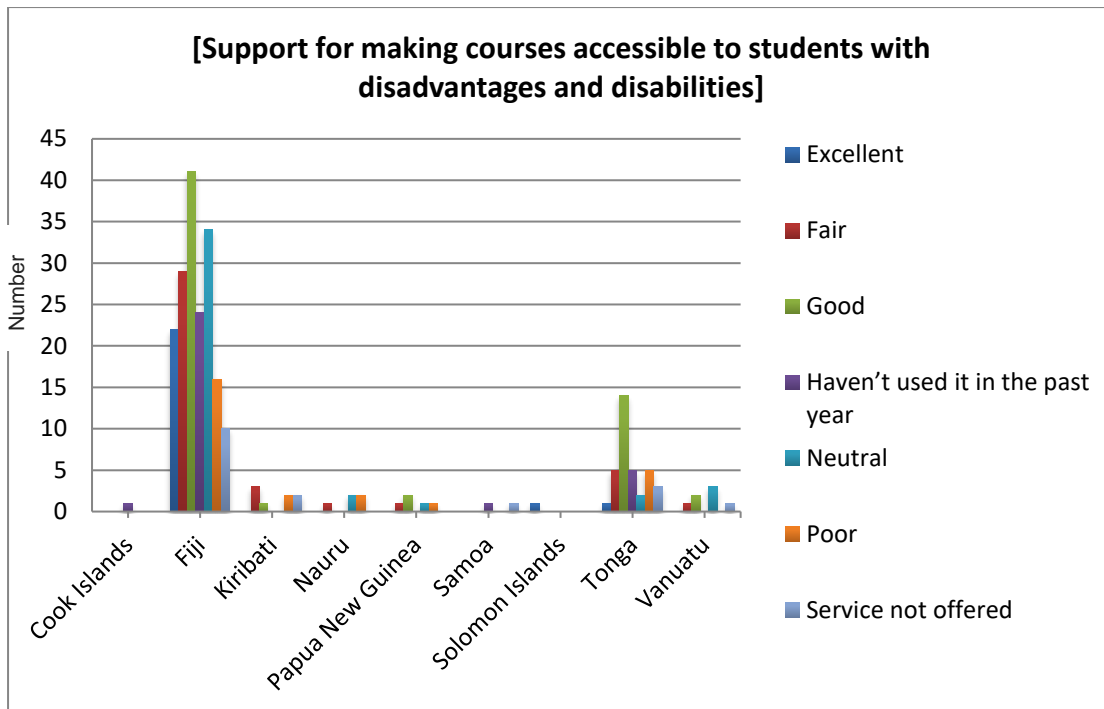
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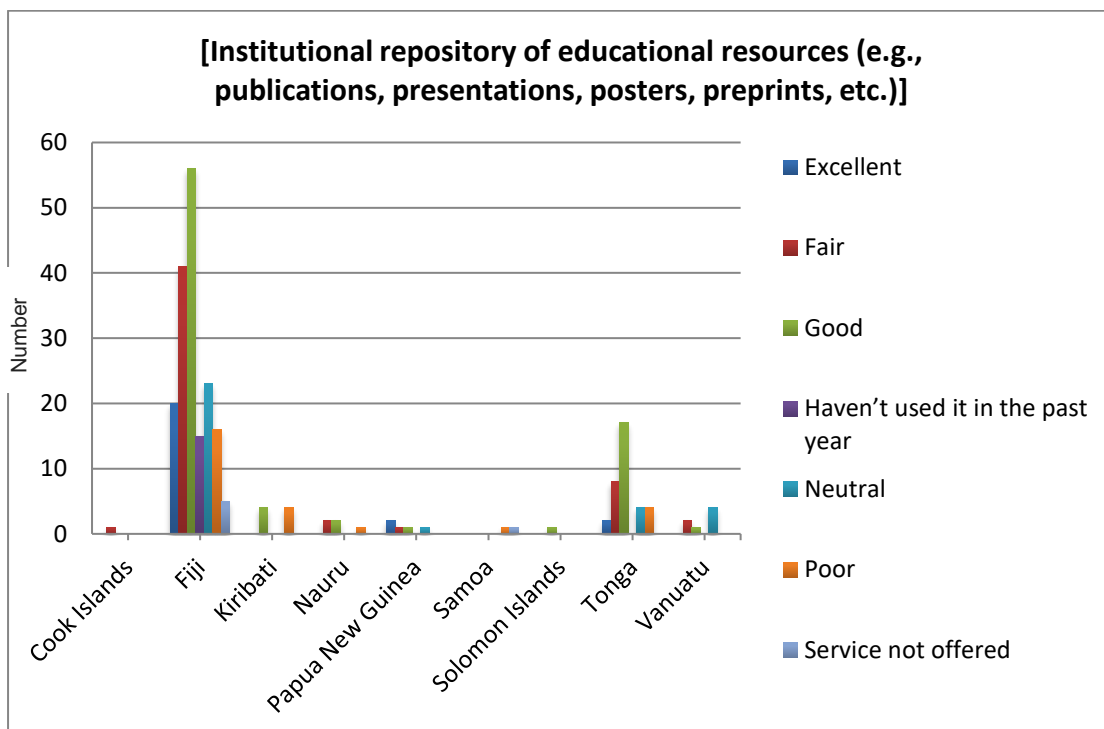
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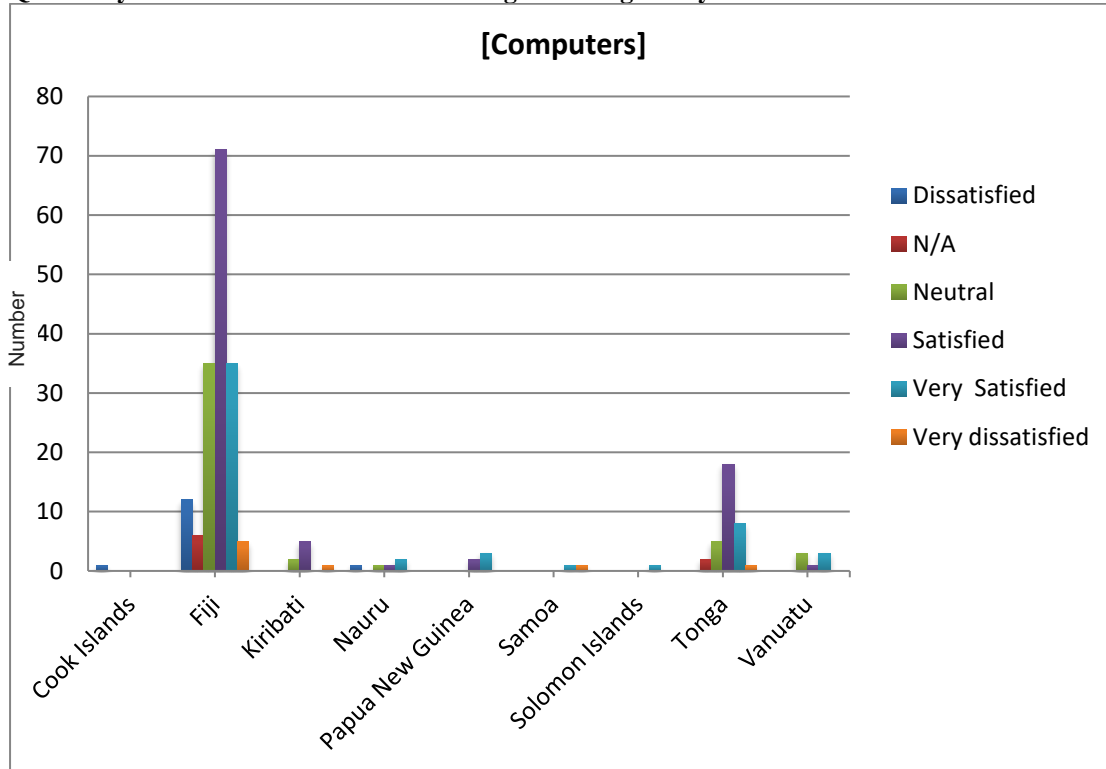


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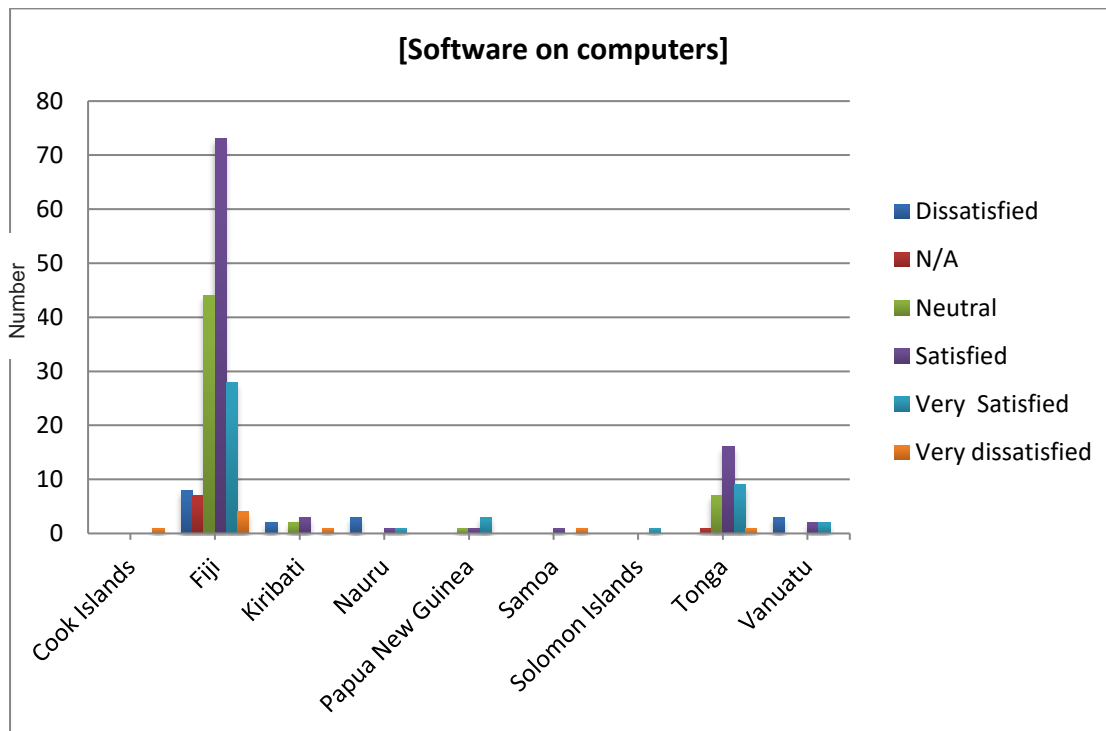


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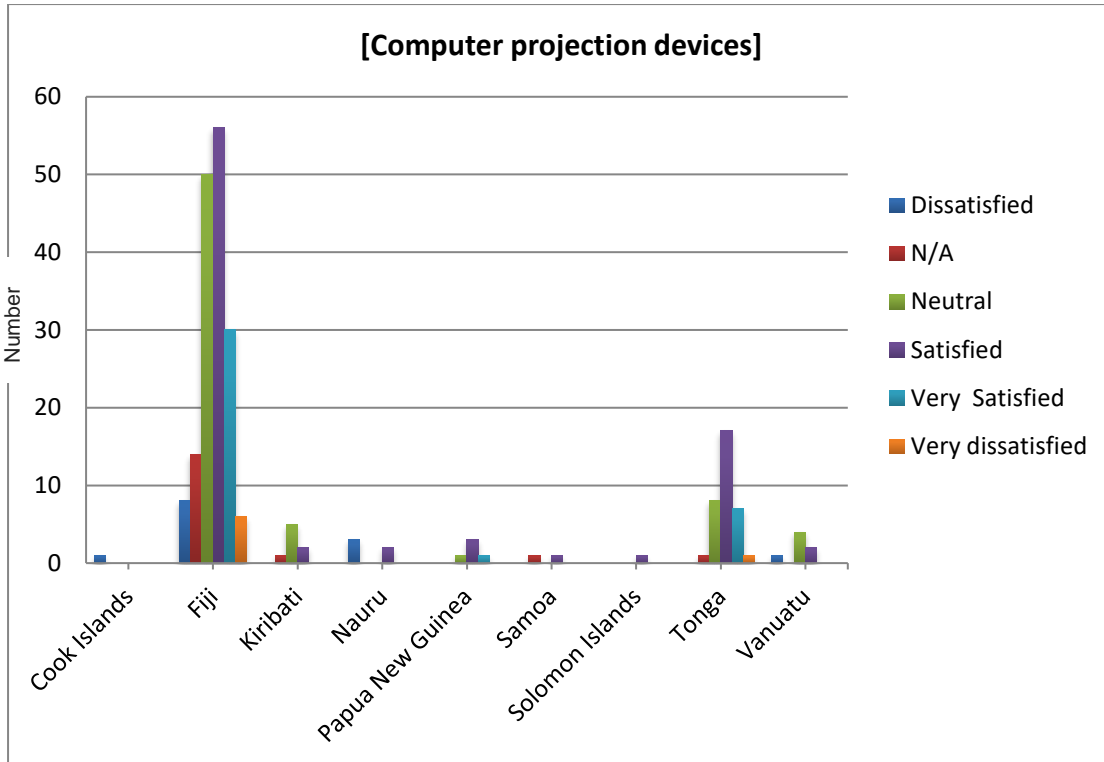
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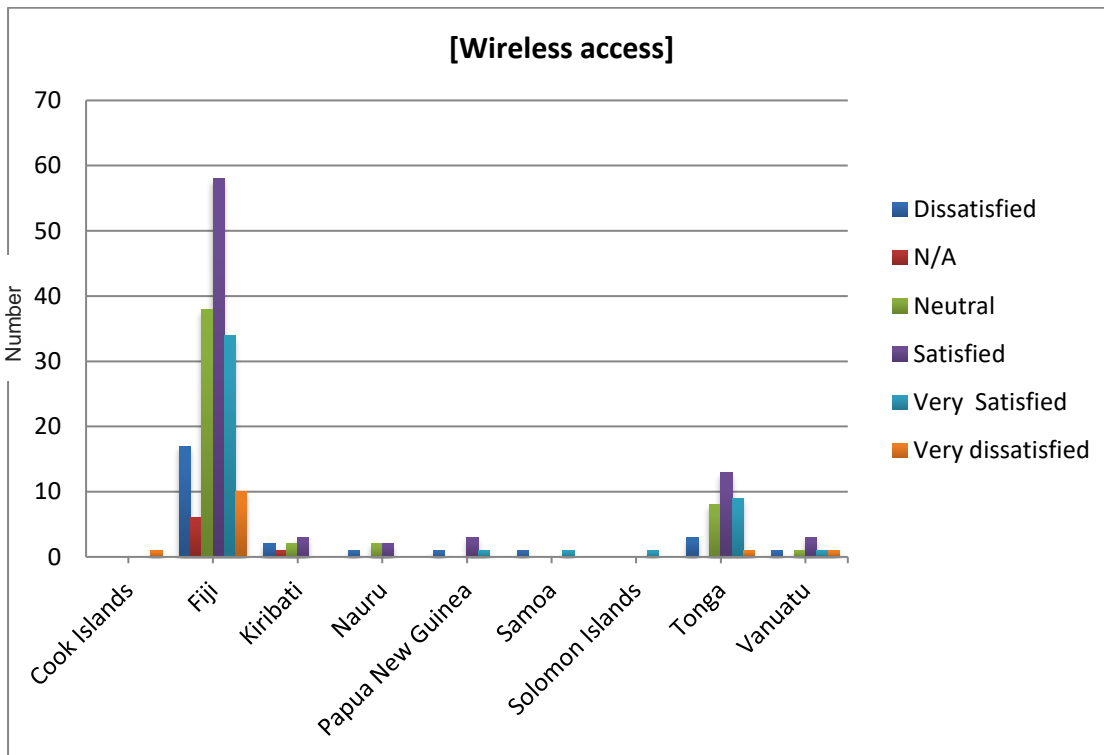
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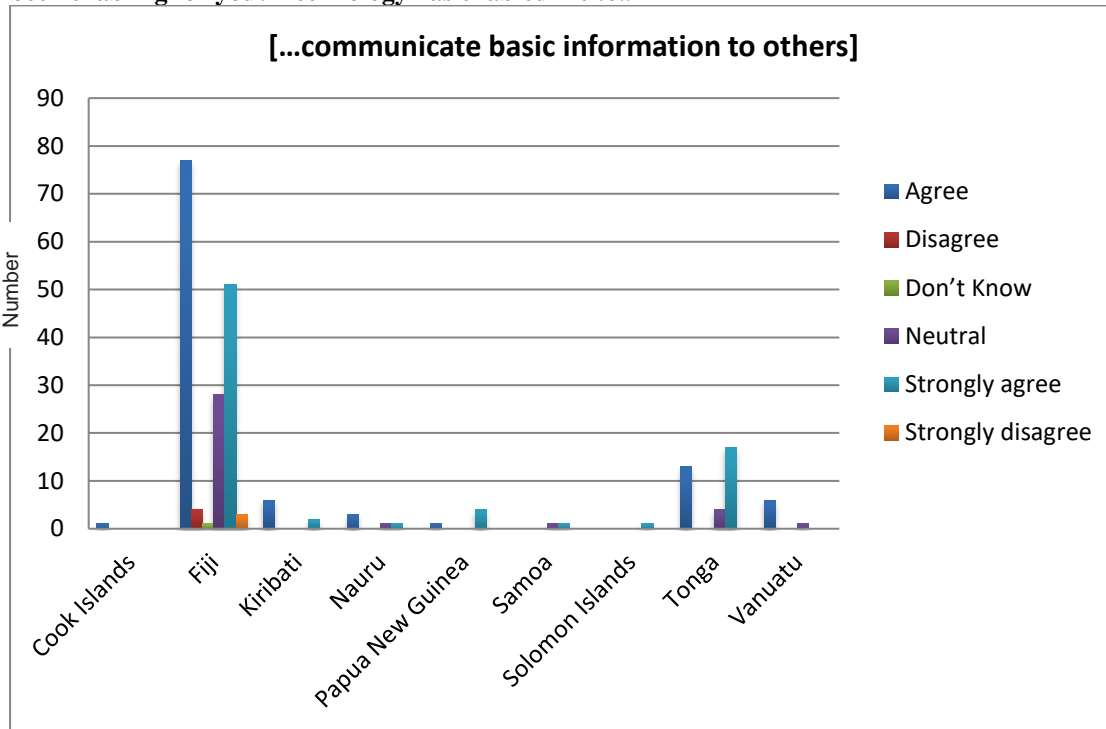


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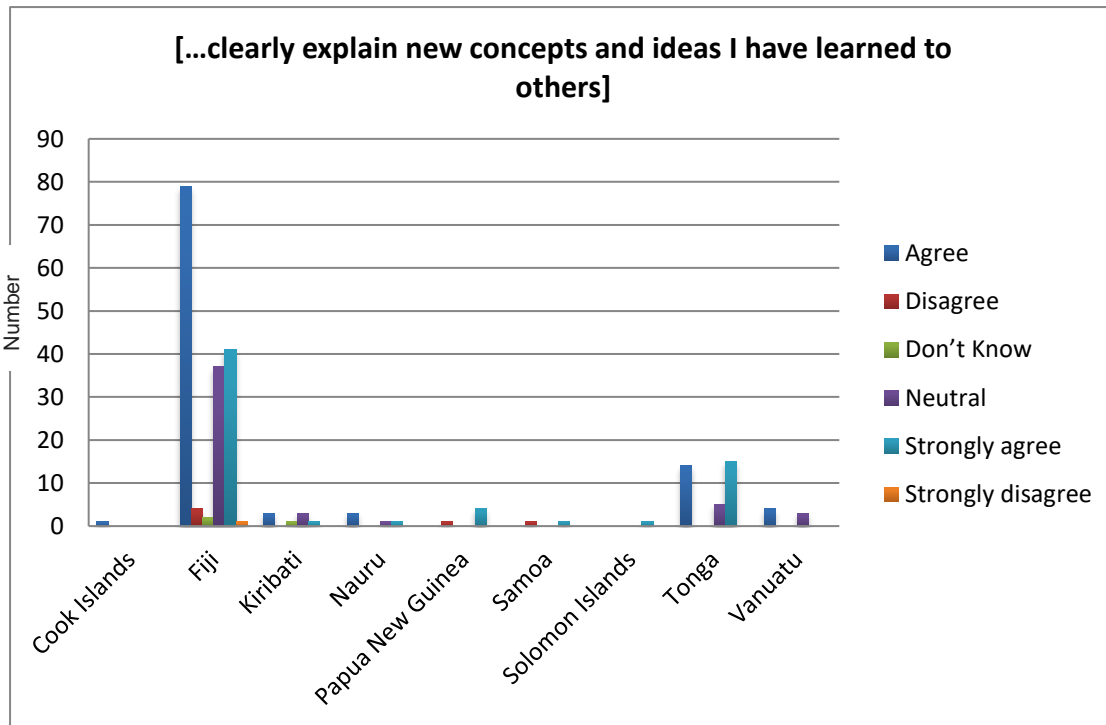


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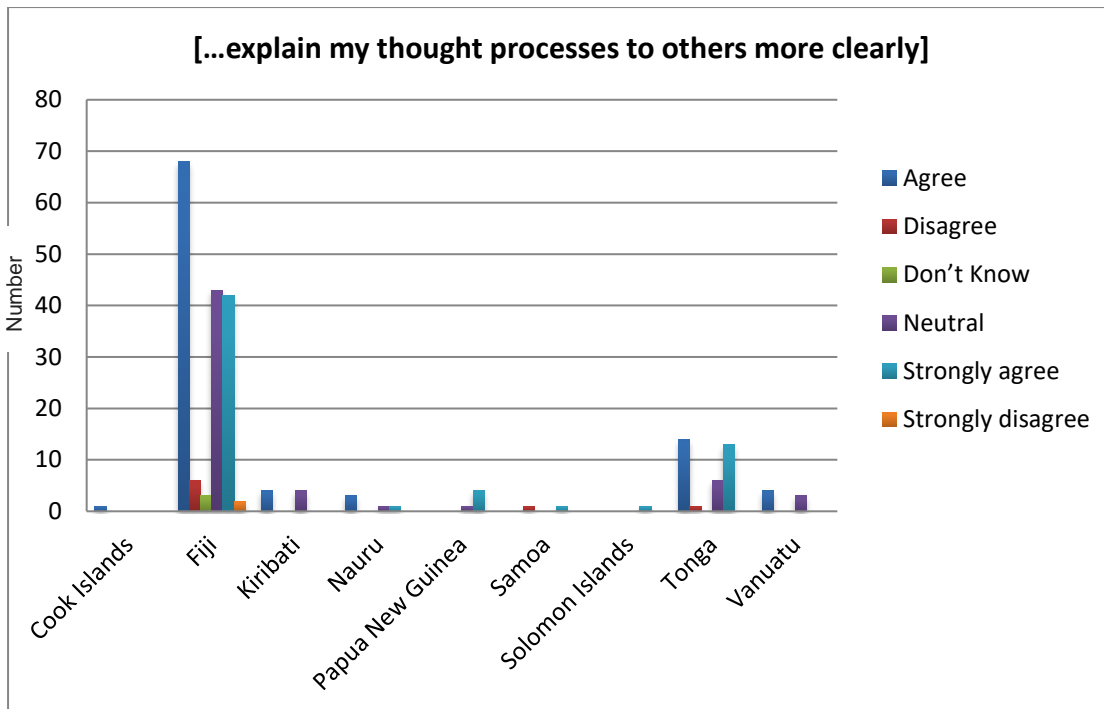
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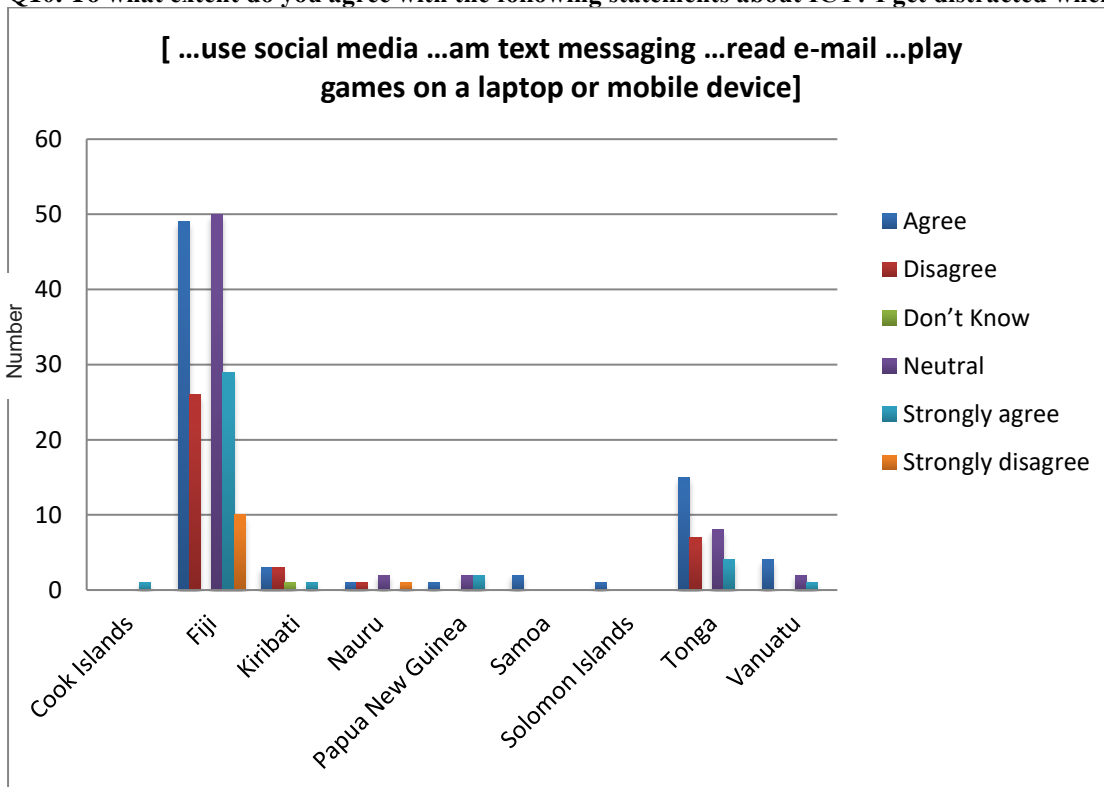


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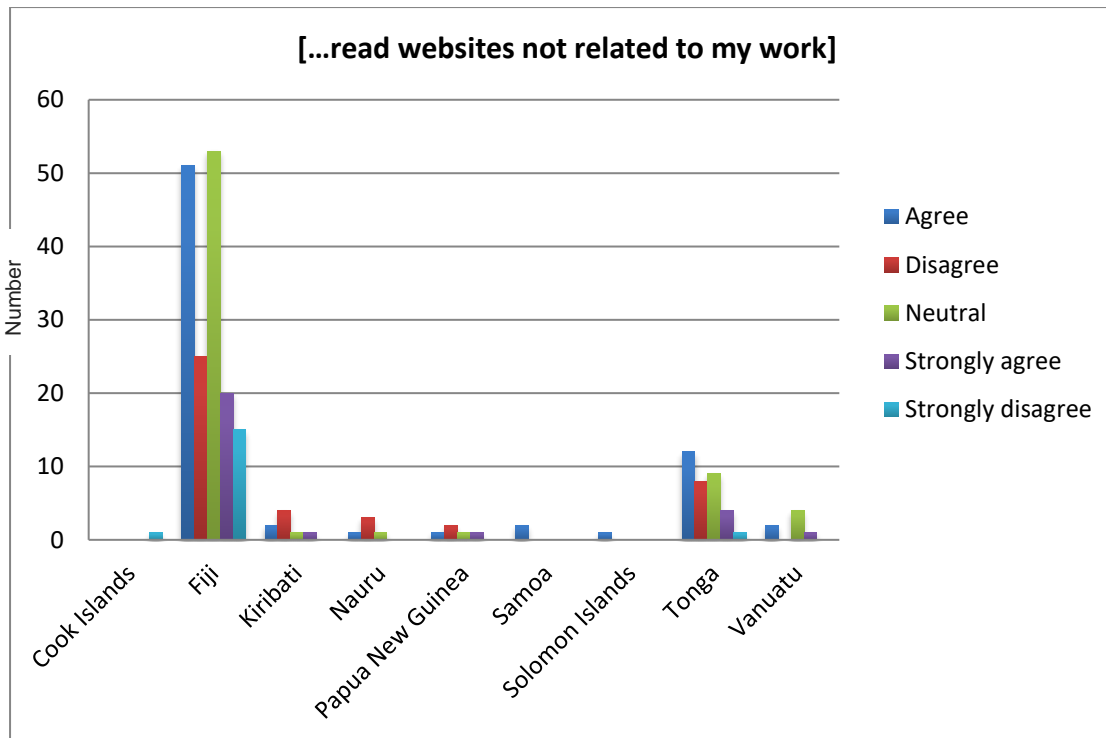


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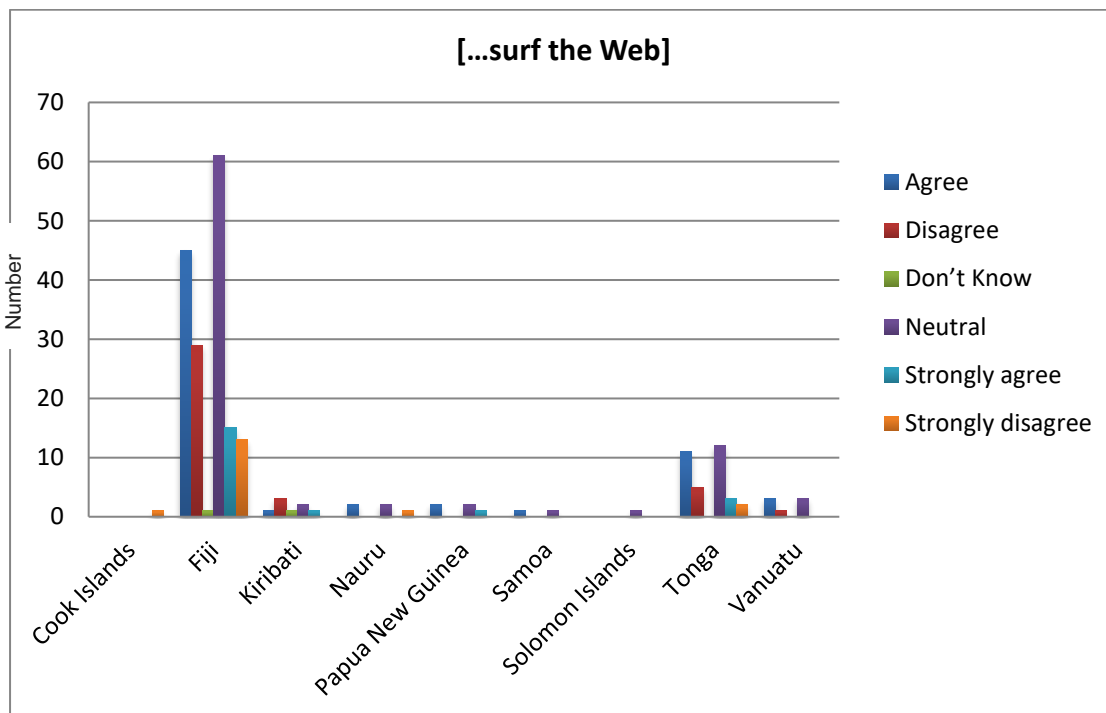
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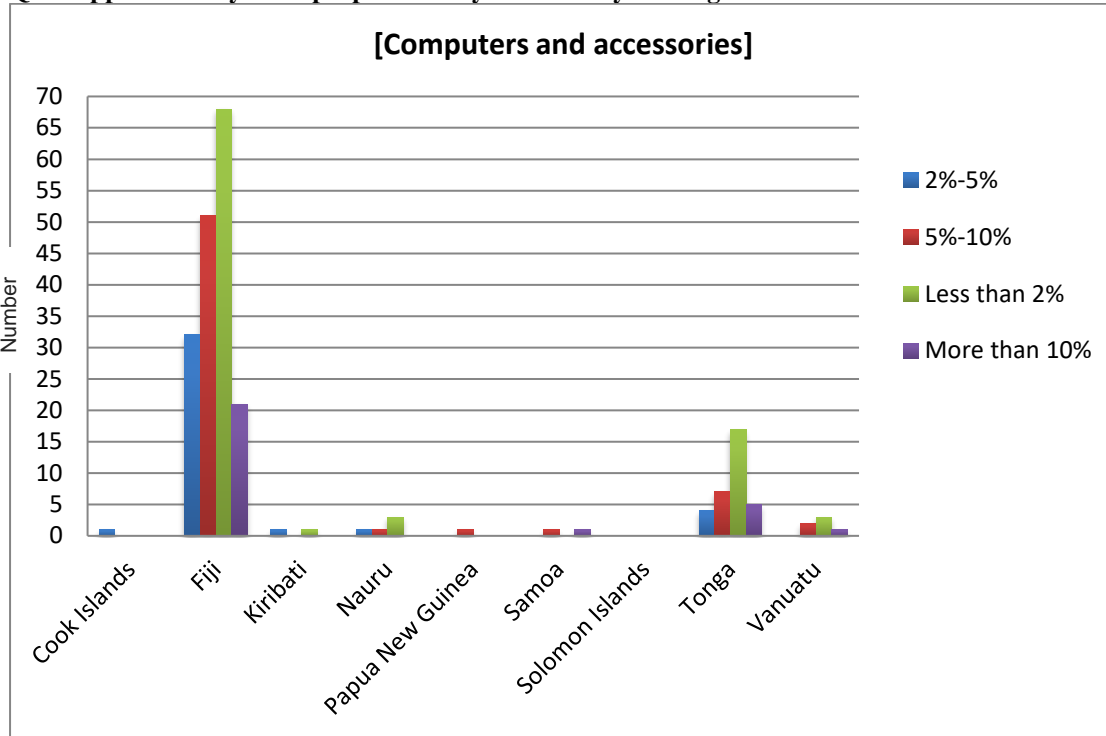


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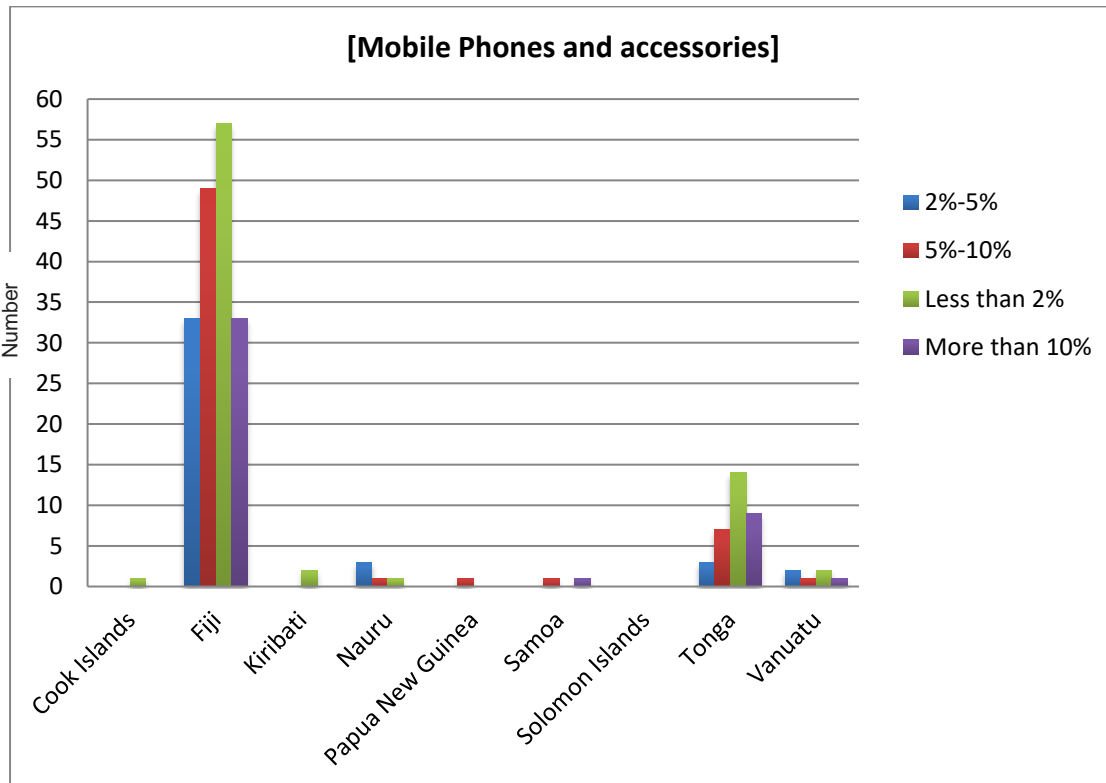


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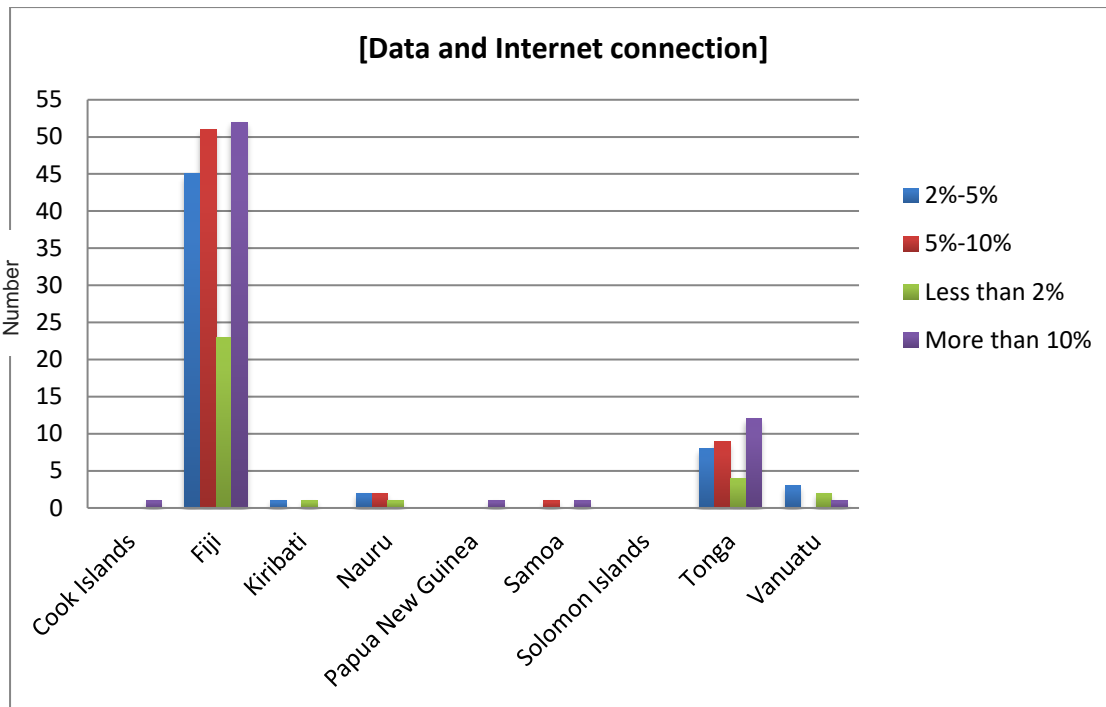
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241 responses

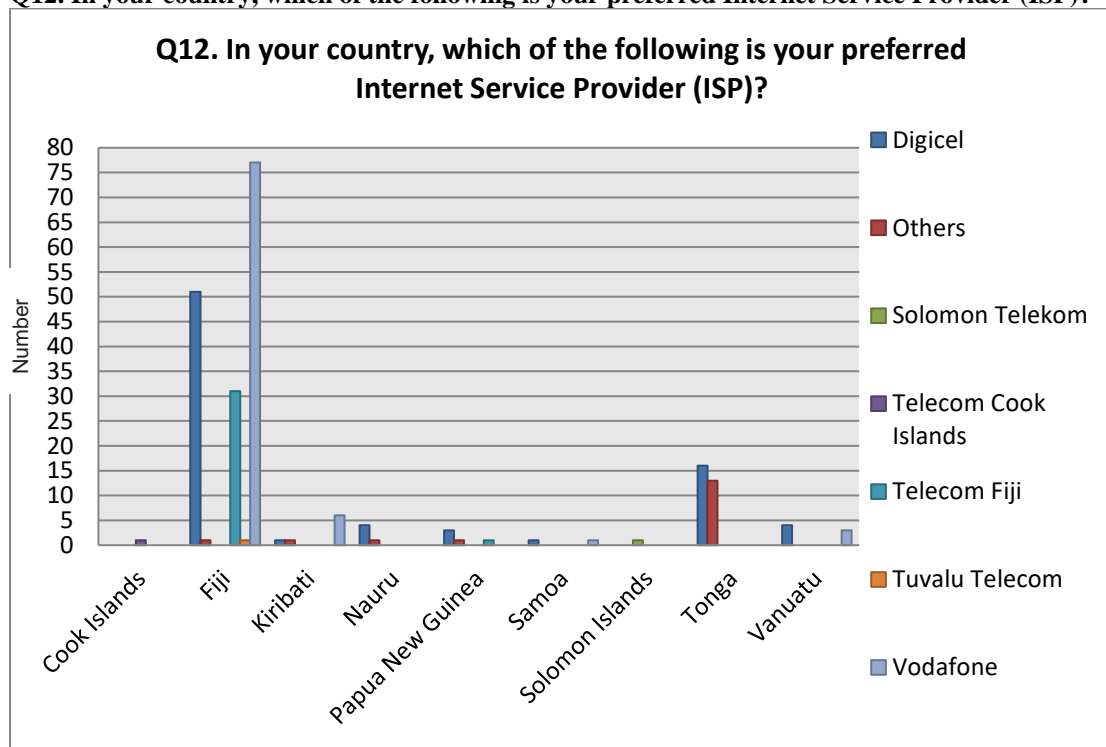


241 responses



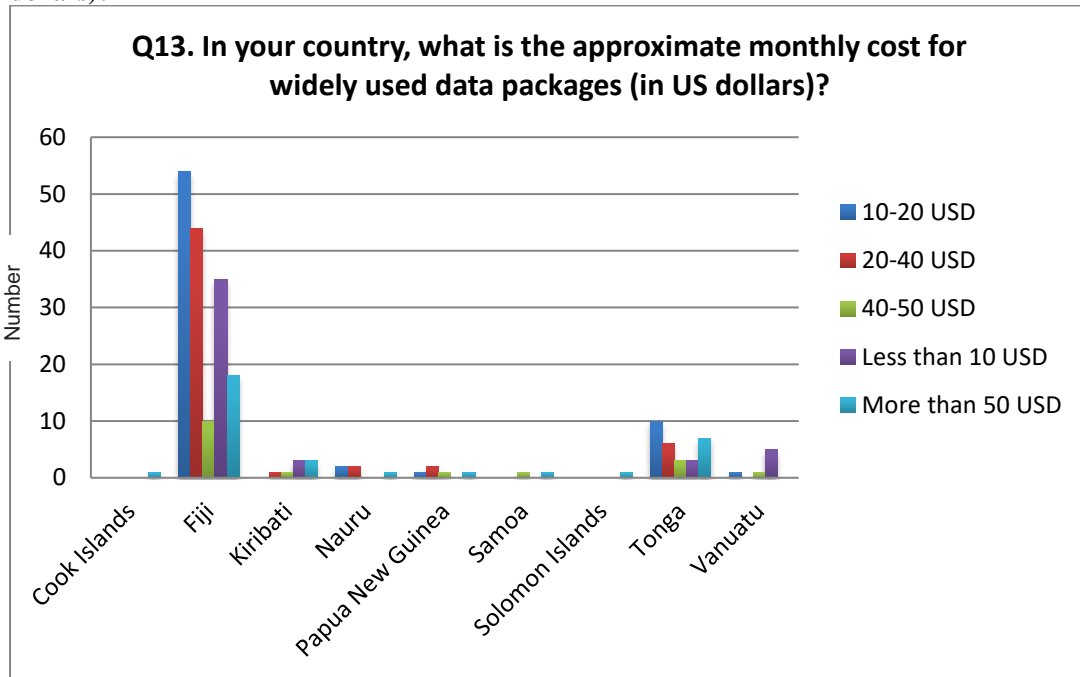
241 responses

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241 responses

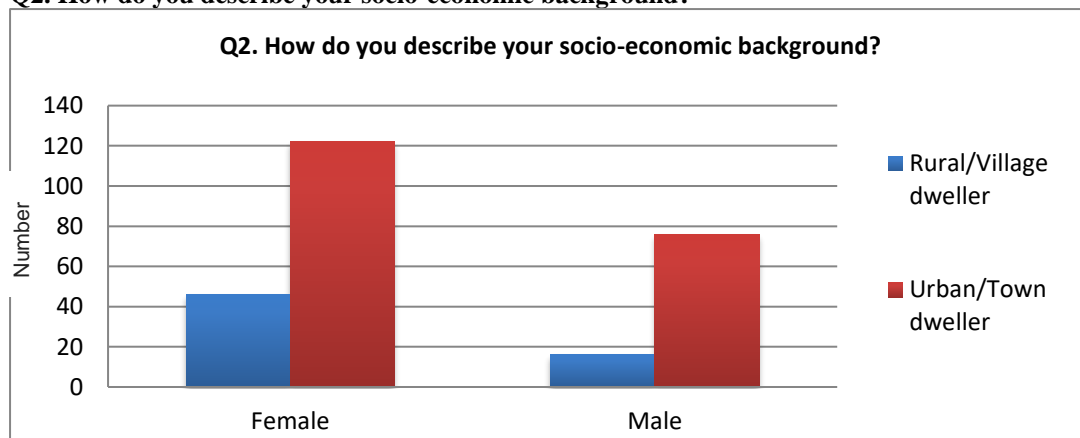
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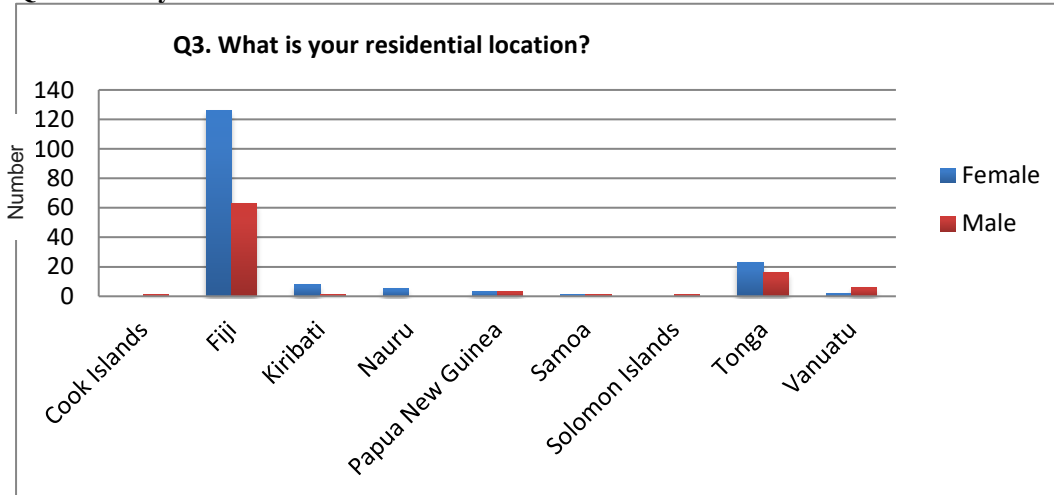
241 responses

Online Survey Data Disaggregated by Gender (Male/Female)

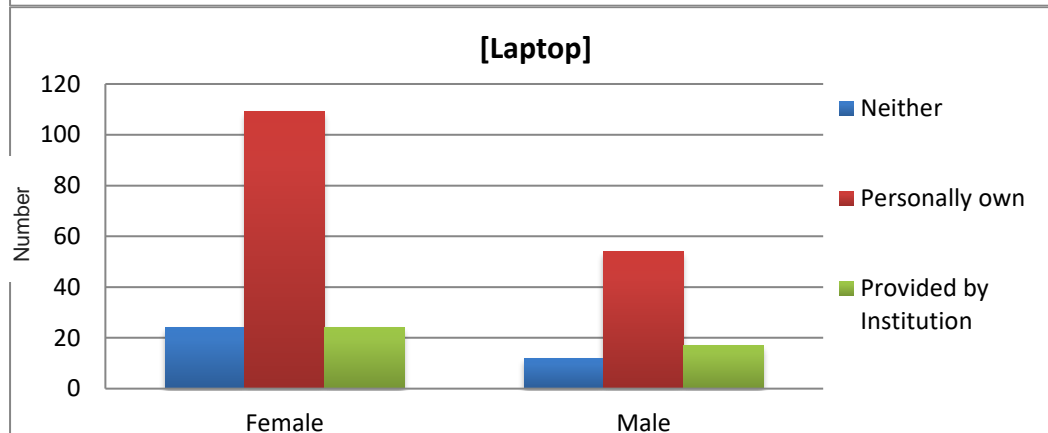
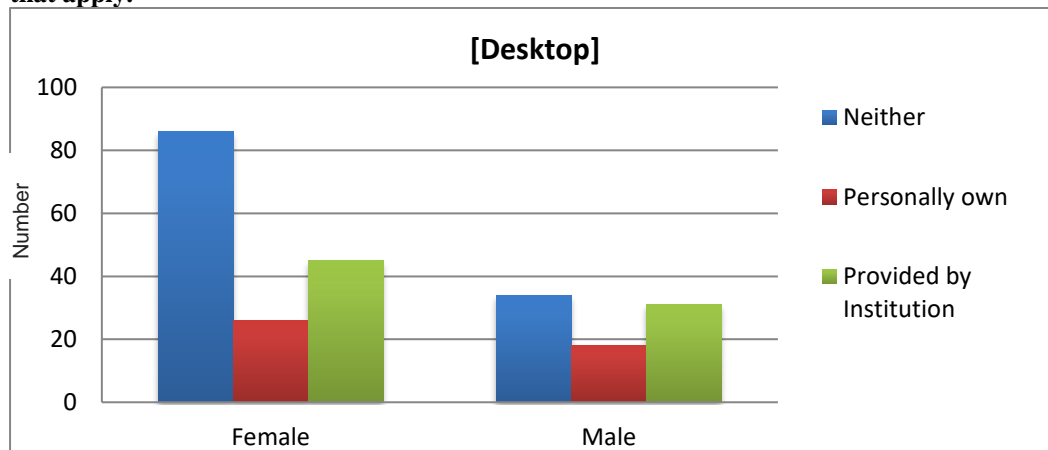
Q2. How do you describe your socio-economic background?

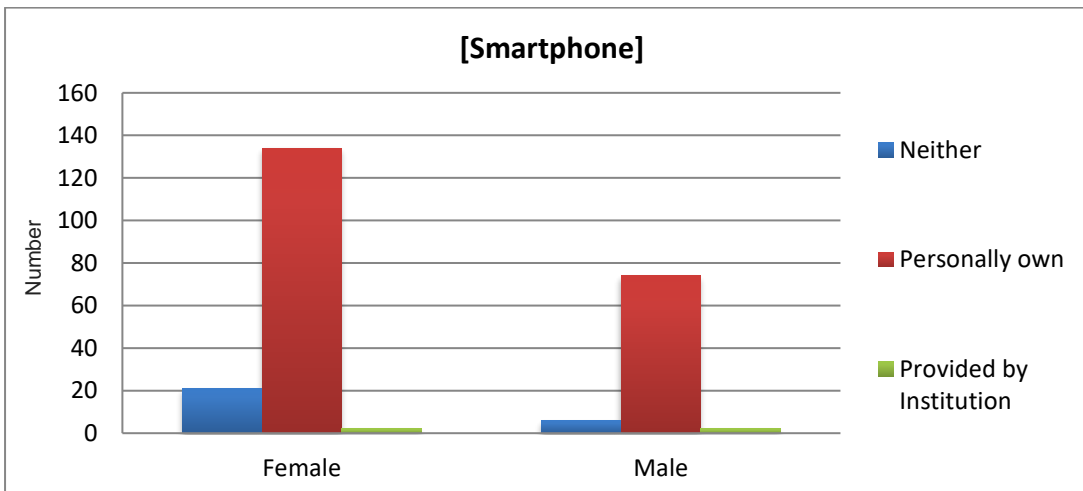
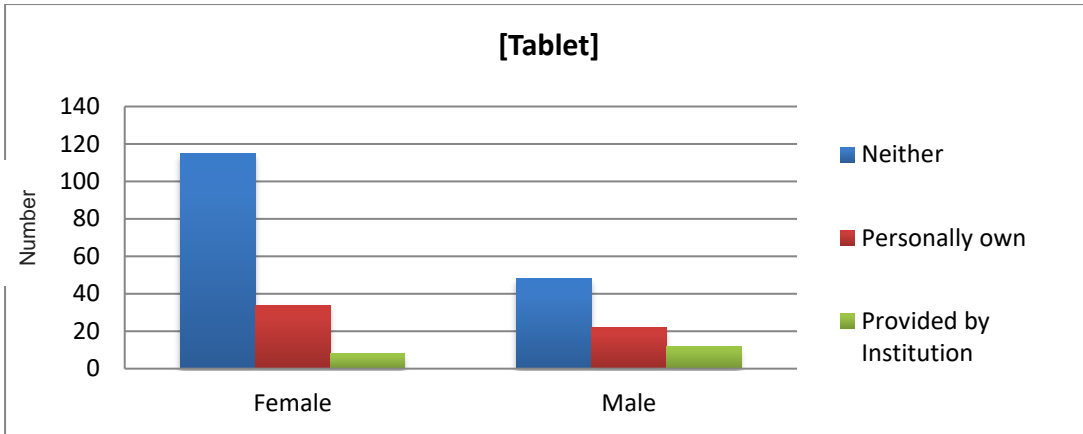


Q3. What is your residential location?

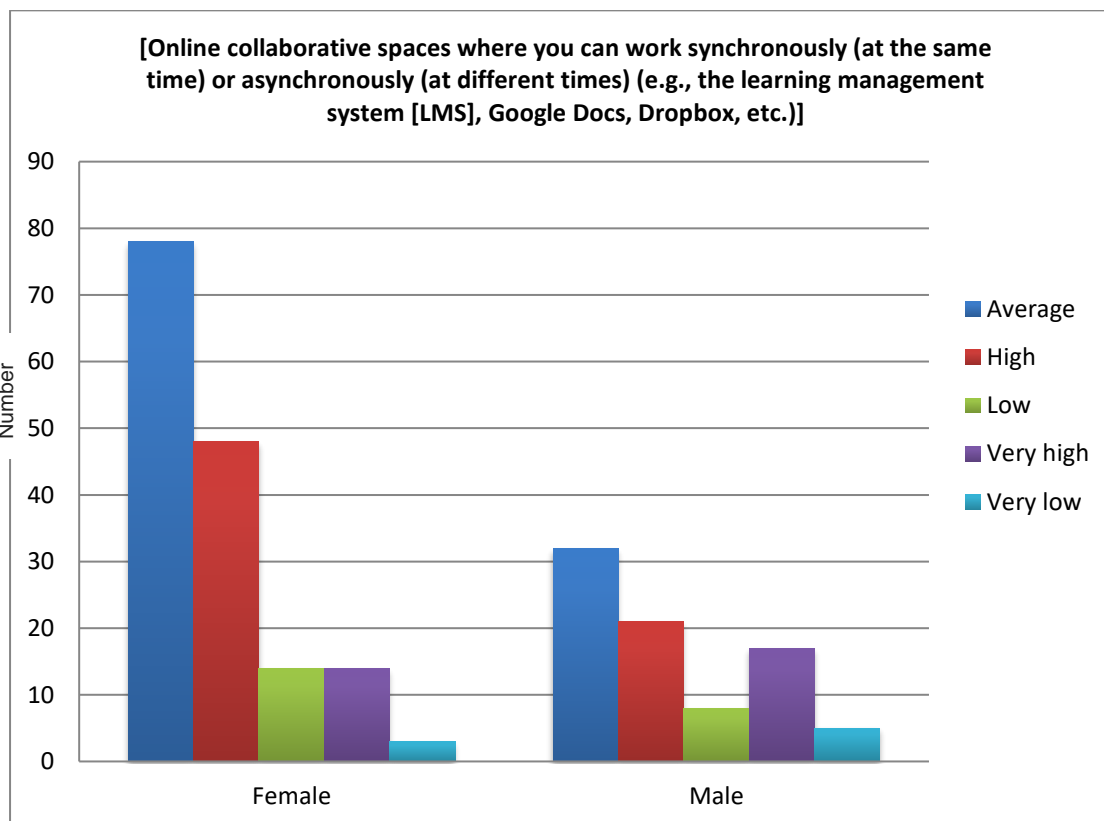
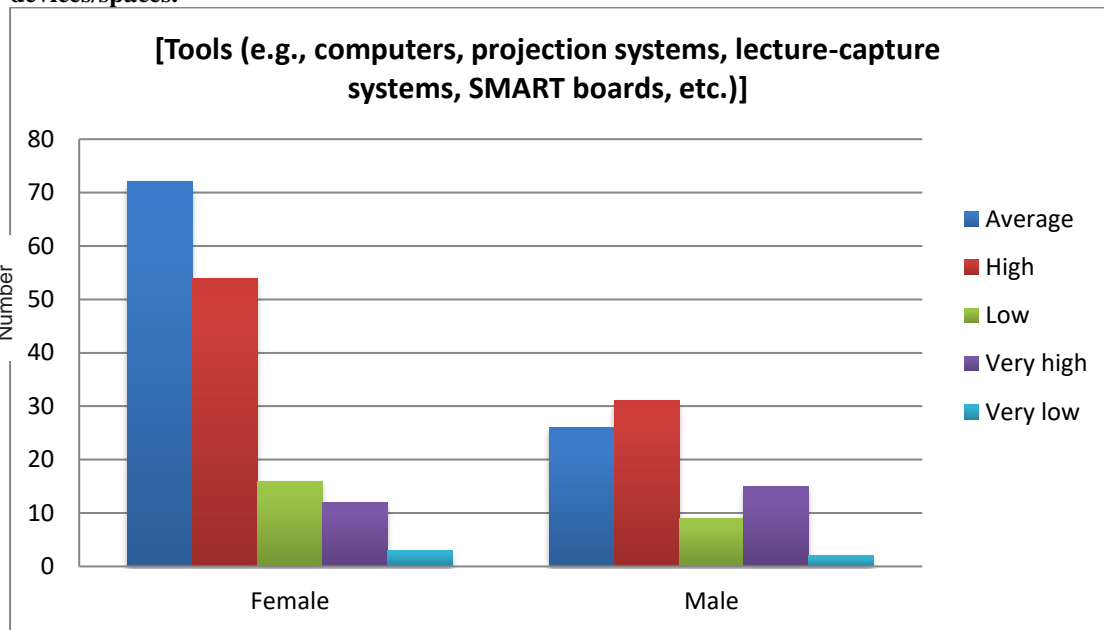


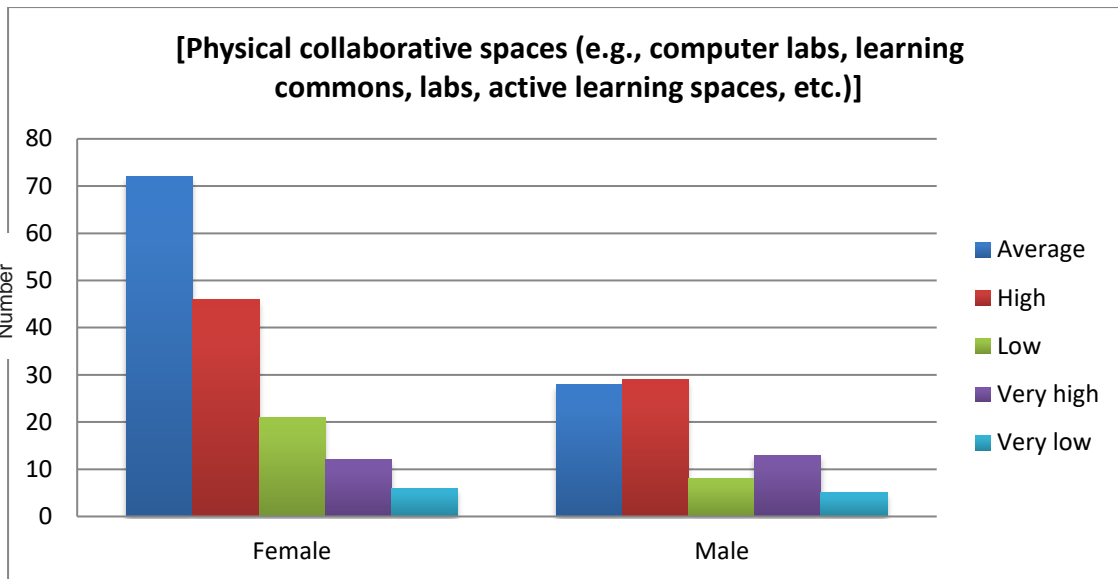
Q4. Do you personally own—or does your employer provide you with—any of these devices? Select all that apply.



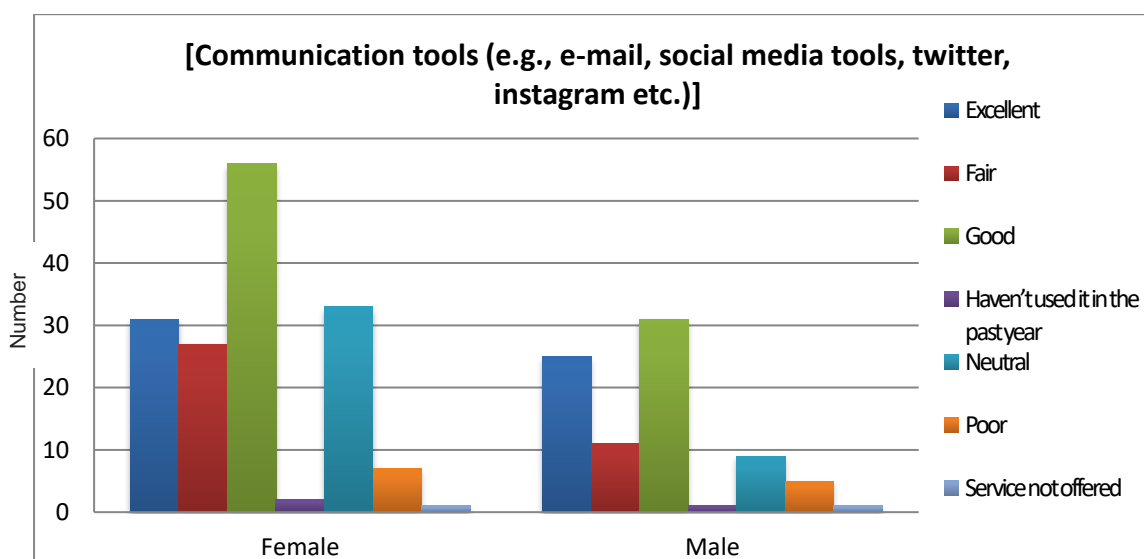
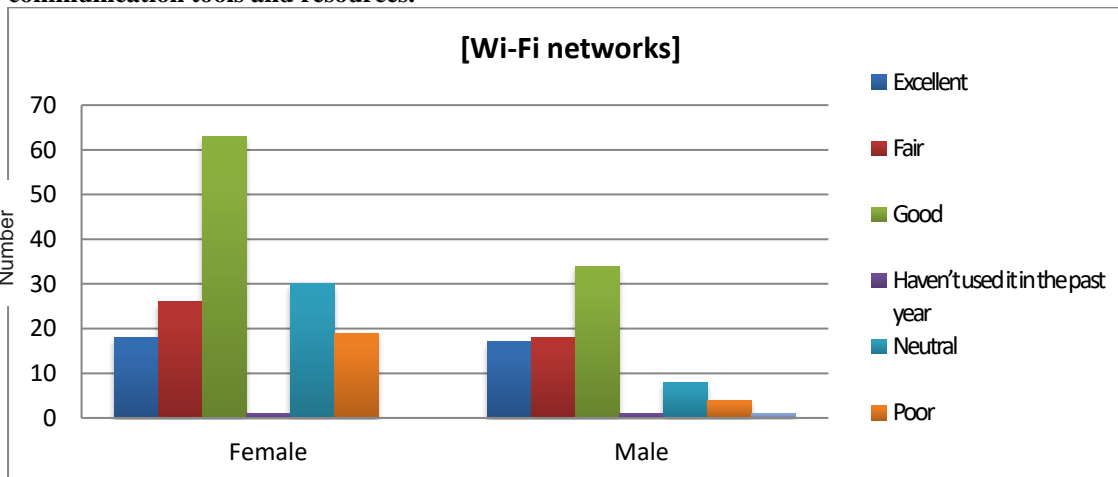


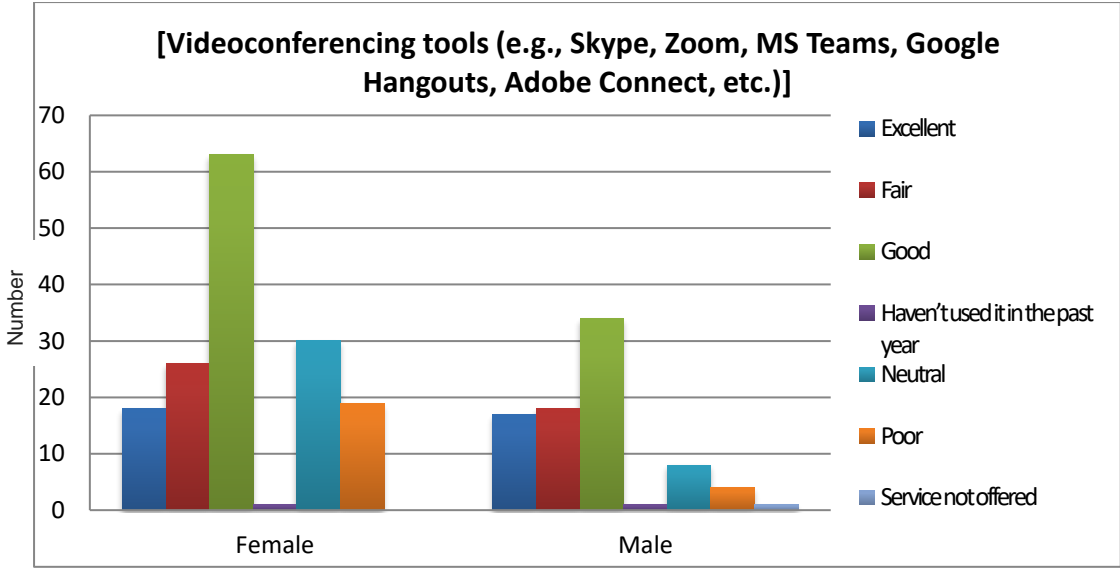
Q5. Please rate the level of your experience with the following ICT-enabled learning/working devices/spaces.



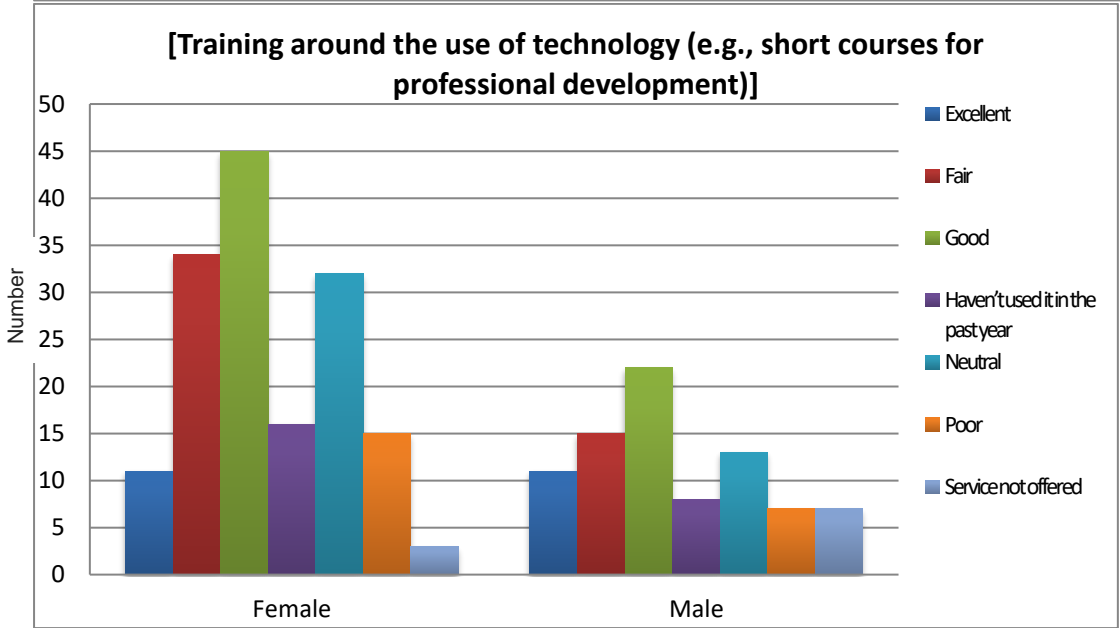
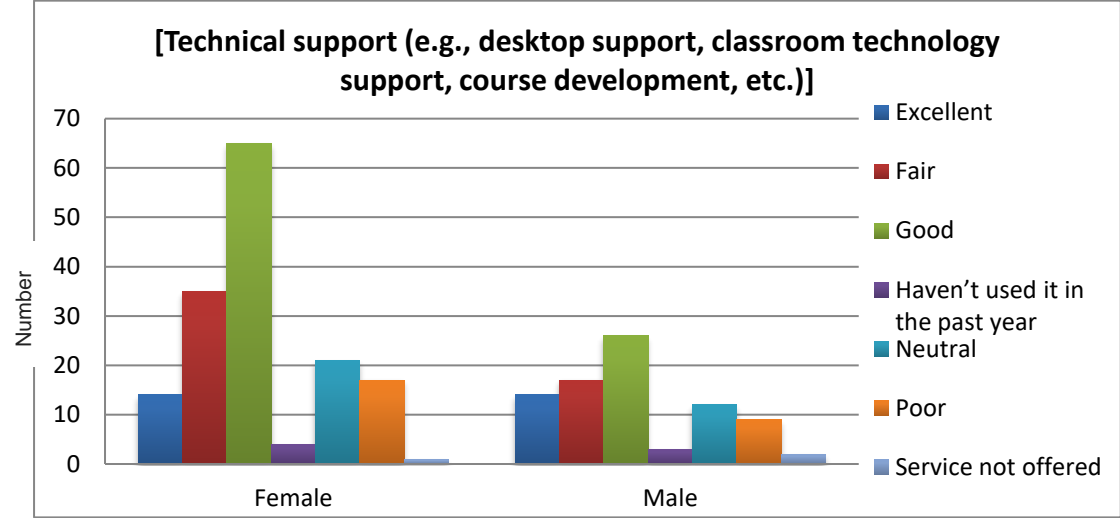


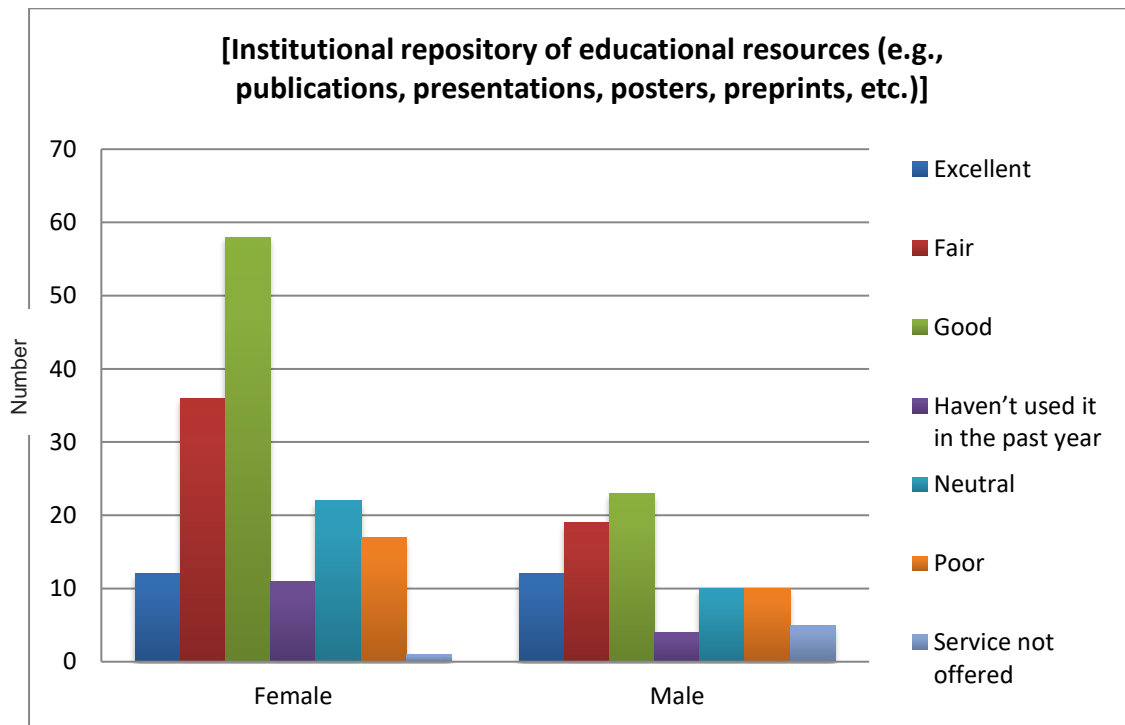
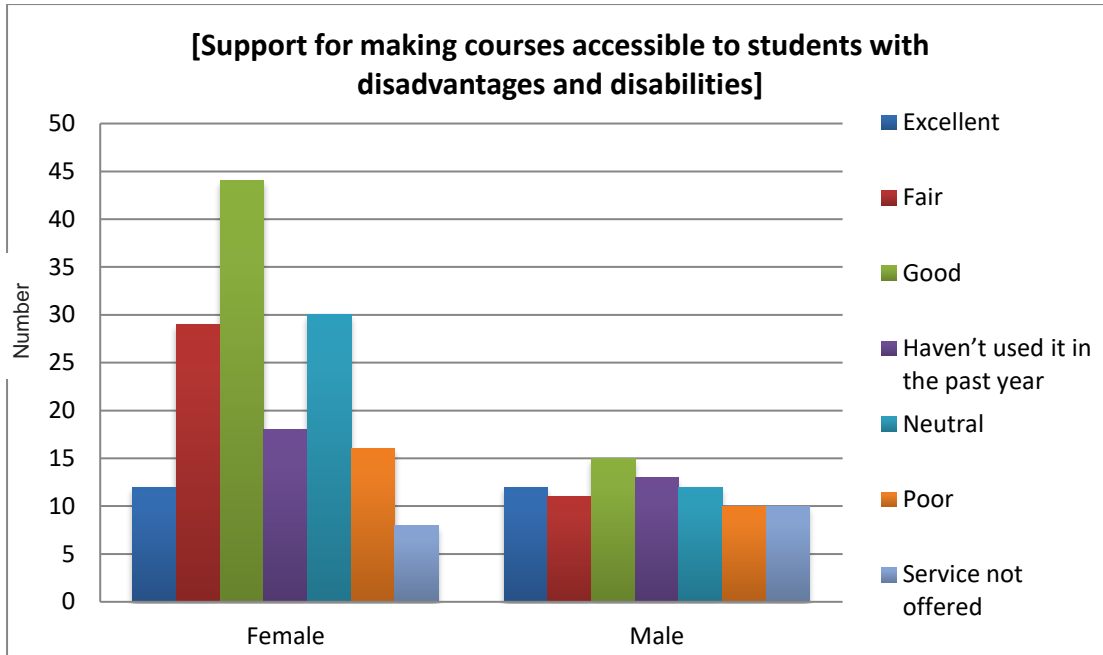
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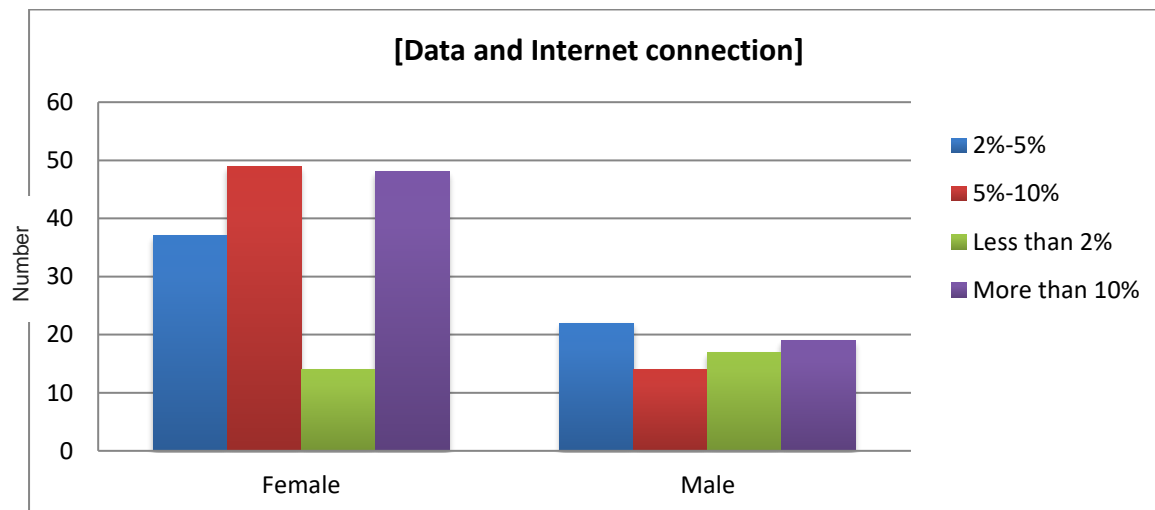
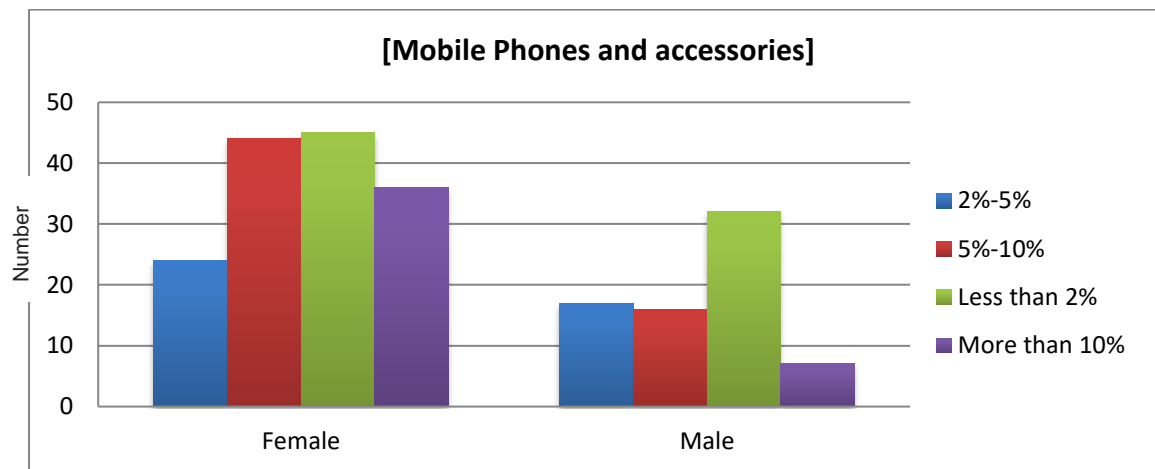
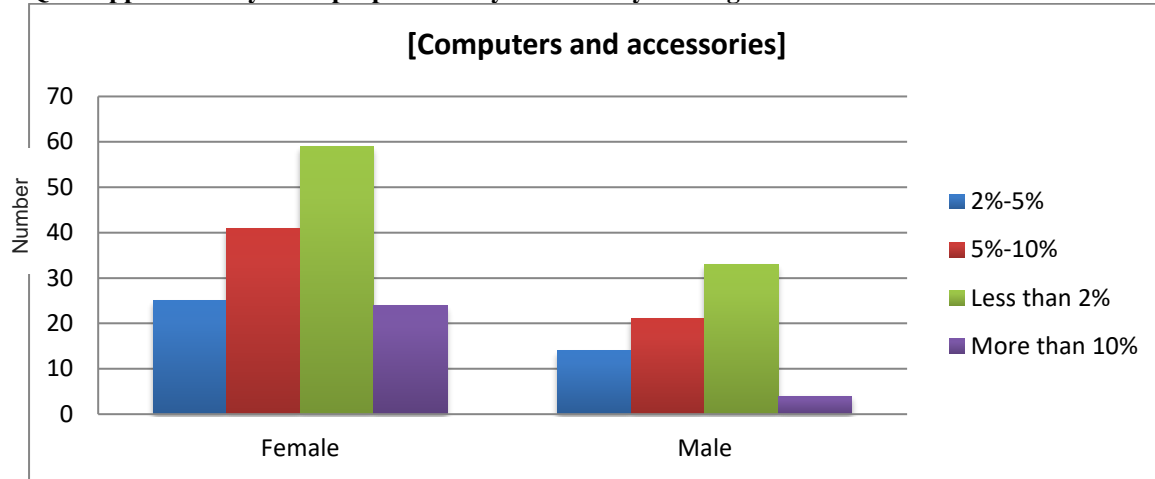


Q7. Please rate the quality of your experience with the following ICT support services:





Q11. Approximately what proportion of your monthly earnings is allocated to the cost of the following?



Discussion

Two hundred and fourteen usable responses to the online survey were received. Two-thirds of the respondents classified themselves as female and one third male, mostly residing in urban communities. The majority of the 241 respondents were from The Republic of Fiji. The sample is small but the best that could be achieved at this time. Nevertheless, this small sample is representative of the urban population in the small island nations of the Pacific.

Personal ownership of ICT (laptops and smartphones) is high among respondents to this survey. Respondents rated *their experience with ICT* from average to high, and the *quality of this experience* as generally fair, to good. The *quality of the experiences with support services* is also rated as fair to good. The majority of the respondents reported being satisfied with ICT and ICTs as having an enabling role. Many also reported the use of social media was distracting although many did not find the use of social media as distracting from their work. When disaggregated by gender (male and female), no significant differences were observed on key indicators such as device ownership, access to support services or satisfaction.

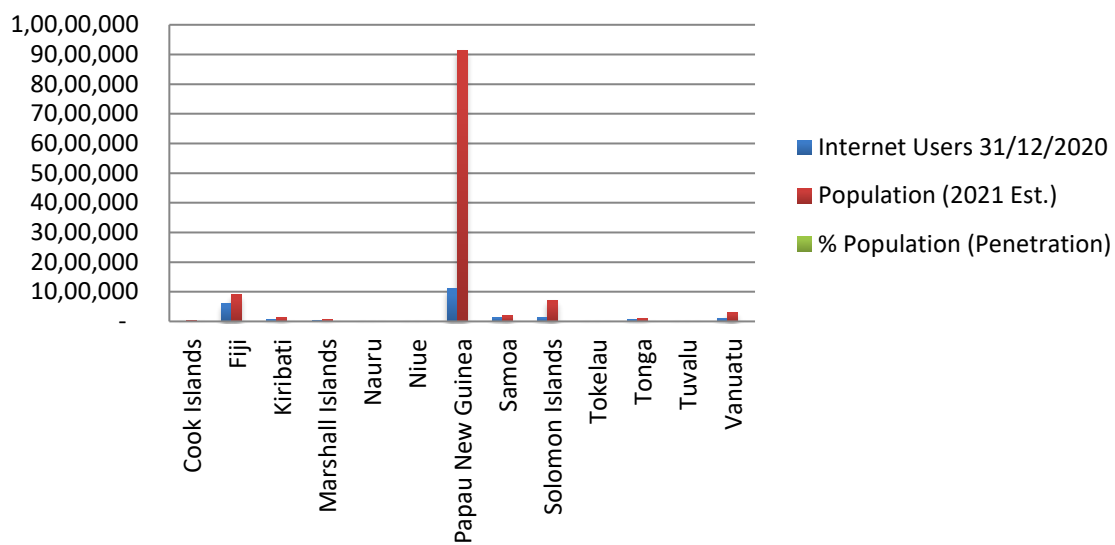
The cost of ICT access and connectivity is high in the region with people spending around 5% of their monthly earnings on ICT and 10-20 US dollars a month on the purchase of data. Access to the Internet is fairly high in the region as the following table shows with the exception of a few countries such as Papua New Guinea, Vanuatu and the Solomon Islands. In these countries access to the Internet is comparatively low.

Internet Users and Population Statistics – 2021

	Internet Users 31/12/2020	Population (2021 Est.)	% Population (Penetration)
Cook Islands	11,377	17,565	65%
Fiji	615,500	902,906	68%
Kiribati	51,300	121,392	42%
Marshall Islands	23,000	59,610	39%
Nauru	6,418	10,876	59%
Niue	1,485	1,619	92%
Papua New Guinea	1,099,945	9,119,010	12%
Samoa	134,500	200,149	67%
Solomon Islands	130,000	703,996	19%
Tokelau	800	1,373	58%
Tonga	75,400	106,760	71%
Tuvalu	6,400	11,931	54%
Vanuatu	110,000	314,464	35%

Source: <https://www.internetworldstats.com>

Internet Users and Population Statistics - 2021



Source: <https://www.internetworldstats.com>

Recommendations

Access to ICT and connectivity in the South West Pacific is improving rapidly. There are nevertheless, serious challenges facing its adoption and use across the region. In most cases this has to do with access to ICT infrastructure as well as digital literacy of citizens. This includes their capacity for effective use of ICT in a wide range of formats including *self-placed modes as well as group-based formats, synchronously and asynchronously*.

While access to ICT and connectivity in the Pacific is growing, we need to be cognizant that this picture is not uniform within and among the various countries in the region. Access to ICT and connectivity to the Internet differs considerably by geographical location, with residents in the urban centres outpacing those in the rural areas. The integration of ICT and connectivity needs to consider this very real digital divide among and within the various communities. But this reality should not hold back the rollout of ICT and connectivity in the region.

Enabling different groups to move at different paces ought to be considered as a realistic way forward. Some of the obvious opportunities in the provision and support of ICT are the adoption of a growing list of ICT tools, social media, and software applications to improve productivity in the workplace. This can include assistance with the adoption and use of:

- LMS use;
- Basic use of Internet and the Web;
- Basic word processing and data analysis tools and software;
- More technical teacher upskilling workshops on the use of ICT;
- Upskilling of COL Focal Points at the provincial level;
- Incentivization with micro-creds and certificates from COL for Focal Points;
- ICT tool or technology suggestion options from COL;
- General professional development for working smarter (not necessarily harder).

Acknowledgement

This paper is an abbreviated version of the final report on “access and connectivity to ICT infrastructure and devices related to COL’s Partnership for Open, Distance and Flexible Learning (ODFL) in the Pacific project (Ref: C22-067).

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Appendix 1: Pacific ICT Access and Use Survey

This survey investigates access to, and the use of information and communications technologies (ICT) in the countries of the South Pacific.

This survey will take about 15-20 minutes to complete and your responses will always remain anonymous. Participation in it is voluntary and you can exit the survey at any point. There are no right or wrong answers to the questions in the survey. We would just like you to answer them honestly. Required questions are indicated with an asterisk (*).

Please use the survey's navigation buttons below to go back or forward within the survey. Using your device or browser's navigation buttons may result in lost answers. So, remember to save your responses after each section.

Conditions of engagement

1. I agree to complete this online survey for research purposes and understand that the data derived from this survey may be made available in unitary and aggregate formats in the form of public presentations, reports, journals or newspaper articles, and/or in books.
2. I understand that my participation in this research survey is totally voluntary and that declining to participate will incur no penalty or loss of benefits.
3. Please indicate your agreement with the informed consent statement below. *Required.
 I agree.
 I do not agree. <<exit survey>> *If you choose this option, you will exit the survey.*

Demography (About You)

1. How do you identify yourself?
 - Male
 - Female
 - Prefer not to answer
2. How do you describe your socio-economic background?
 - Urban/Town dweller
 - Rural/Village dweller
3. What is your residential location?
 - Cook Islands
 - Fiji
 - Kiribati
 - Marshall Islands
 - Nauru
 - Niue
 - Papua New Guinea
 - Samoa
 - Solomon Islands
 - Tokelau
 - Tonga
 - Tuvalu
 - Vanuatu

Device Access and Ownership

4. Do you personally own—or does your employer provide you with—any of these devices? Select all that apply.

	Personally own	Provided by Institution	Neither
• Desktop			
• Laptop			
• Tablet			
• Smartphone			

Experience with, and Use of ICT

5. Please rate your level of *experience* with the following *ICT-enabled learning/working devices/spaces*.

	Service not offered	Haven't used in the past year	Poor	Fair	Good	Excellent
Tools (e.g., computers, projection systems, lecture-capture systems, SMART boards, etc.)						
Online collaborative spaces where you can work synchronously (at the same time) or asynchronously (at different times) (e.g., the learning management system [LMS], Google Docs, Dropbox, etc.)						
Physical collaborative spaces (e.g., computer labs, learning commons, labs, active learning spaces, etc.)						

6. Please rate your level of experience with the following *ICT-enabled connection and communication tools and resources*.

	Service not offered	Haven't used in the past year	Poor	Fair	Neutral	Good	Excellent
Wi-Fi networks							
Communication tools (e.g., e-mail, social media tools, etc.)							
Videoconferencing tools (e.g., Skype, Zoom, MS Teams, Google Hangouts, Adobe Connect, etc.)							

7. Please rate your level of experience with the following *ICT support services*:

	Service not offered	Haven't used in the past year	Poor	Fair	Neutral	Good	Excellent
Technical support (e.g., desktop support, classroom technology support, course development, etc.)							
Training around the use of technology (e.g., short courses for professional development)							
Support for making courses accessible to students with disadvantage and disabilities							
Institutional repository of educational resources (e.g., publications, presentations, posters, preprints, etc.)							

Perceptions of, and satisfaction with ICT

8. Rate your satisfaction with the following technologies at your institution:

	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied	N/A
Computers						
Software on computers						
Computer projection devices						
Wireless access						

9. Rate your agreement with the following statements, specifically considering how using technology has been *enabling* for you? Technology has enabled me to...

	Don't Know	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
...communicate basic information to others						
...clearly explain new concepts and ideas I have learned to others						
...explain my thought processes to others more clearly						

10. To what extent do you agree with the following statements about ICT? I get distracted when I...

	Don't Know	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
...use social media						
...am text messaging						
...read e-mail						
...play games on a laptop or mobile device						
...read websites not related to my work						
...surf the Web						

Costs of ICT in relation to income and expenditure

11. Approximately what proportion of your monthly earnings is allocated to the cost of the following?

	Less than 2%	2-5%	5-10%	More than 10%
Computers and accessories				
Mobile Phones and accessories				
Data and Internet connection				

12. In your country, which of the following is your preferred Internet Service Provider (ISP)?

	Cook Islands	Fiji	Kiribati	Marshall Islands	Nauru	Niue	Samoa	Solomon Islands	Tokelau	Tonga	Tuvalu	Vanuatu
Digicel												
Vodafone												
Other												

13. In your country, what is the approximate monthly costs for widely used data packages (in US dollars)?

	Less than 10 USD	10-20 USD	20-40 USD	40-50 USD	More than 50 USD
Cook Islands					
Fiji					
Kiribati					
Marshall Islands					
Nauru					

Niue					
Papua New Guinea					
Samoa					
Solomon Islands					
Tokelau					
Tonga					
Tuvalu					
Vanuatu					

Please click the “Submit” button below to submit your survey.

Thank you for responding to the Pacific ICT Access & Use Survey!