

**Technology enabled learning at
National University of Samoa
(NUS)**

**Teachers' Access to Technology
and its implications**

by

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Introduction

- ▶ Based on a baseline study conducted Jan 2017 at NUS
- ▶ Part of COLTEL project funded by Commonwealth of Learning
- ▶ Goal of COLTEL - systematic approach to institutionalising technology-enabled learning (TEL) at NUS.
- ▶ Aim of study to assess current status of TEL at NUS by investigating teachers perceptions and attitudes to TEL.
- ▶ Questionnaires from TEL Implementation Handbook (Kirkwood & Price, 2016) provided by the Commonwealth of Learning (COL).



Survey

- ▶ Questionnaire – 6 sections & investigated following
 - ▶ Background information
 - ▶ Access and Use of ICTs
 - ▶ Use of ICTs for Teaching and Learning
 - ▶ Use of ICTs for Research and Scholarship
 - ▶ Perceptions on the use of Technology enabled learning
 - ▶ Open ended- Comments on Technology enabled learning
- ▶ Most questions likert scale type
- ▶ For staff, surveys were distributed to all of the 169 teaching staff
- ▶ 106 responded - 65% response rate

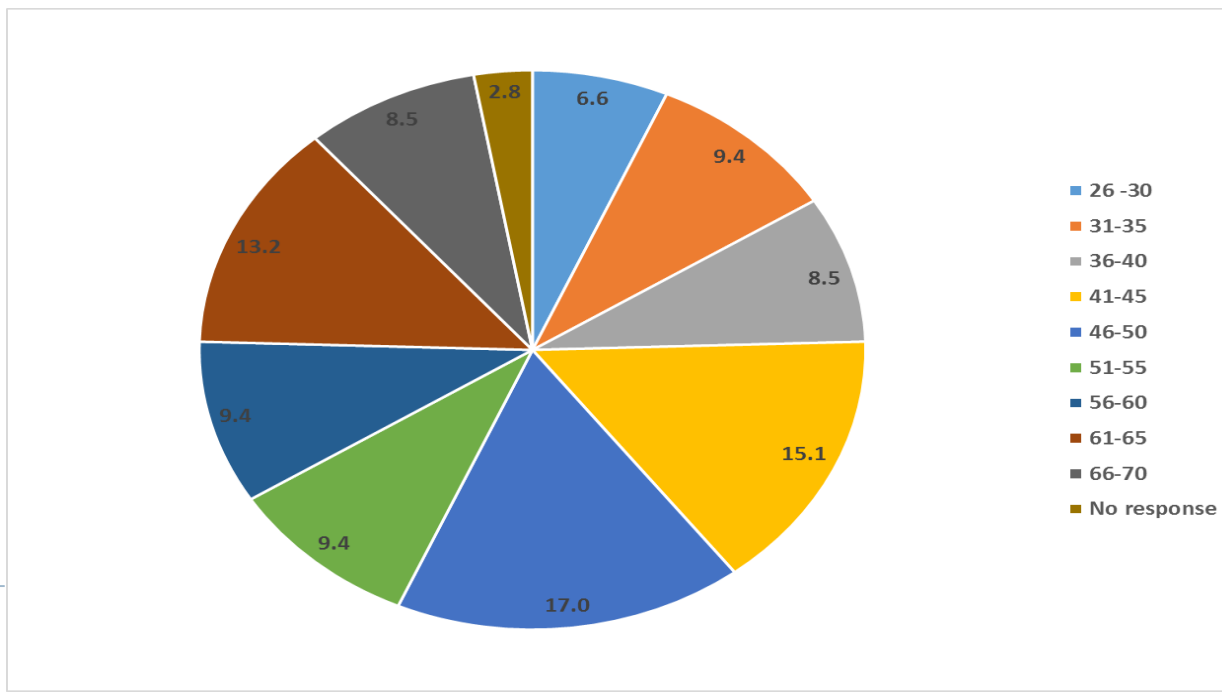


FINDINGS



Section A: Background information

- ▶ 106 teachers responded to the survey,
 - ▶ 45 were male(43%) and 58 were female(57%).
 - ▶ different age groups fairly evenly distributed with highest percentage in the age group of 46-50 (16.98%).
 - ▶ Figure 1 presents age-wise distribution of the respondents.



Background information

- ▶ majority of respondents teaching undergraduate (62.6%)
- ▶ 13% teaching graduate and postgraduate and only 2% involved doctoral research.
- ▶ About 51% of the respondents have less than 10 years of teaching experience.
- ▶ 10 respondents have had over 30 years of teaching experience.



Section B: Access and Use of Information and Communication Technologies

- ▶ ***Ownership of Devices***
- ▶ **The survey indicated that majority of the respondents (87%) own laptops followed by 52% also owning desktops**
- ▶ **Very few respondents indicated having tablets and smartphones.**
- ▶ **36% of the respondents indicated that they plan to purchase smartphones and 23% plan to purchase tablets in the next 12 months**



Access to Devices at the University

- ▶ Practically all of the respondents have access to desktops at the university with 63% having access to laptops and 11% having access to tablets .
- ▶ Use of personal devices in the university was mostly confined to laptops, smartphones and tablets.
- ▶ While NUS currently does not have any policy banning the use of devices on campus, there seemed to be some misunderstanding on what the university allows.
- ▶ However, NUS does not allow personal devices to be connected to the university network due to security reasons.



Access to Internet

- ▶ Majority of teachers accessed the internet at the office (64%) with 33% accessing internet from home.
- ▶ Very few (3%) use cyber cafes for internet access (Figure 4). Internet access by the teachers is mostly through dialup and mobile devices (see Figure 5).

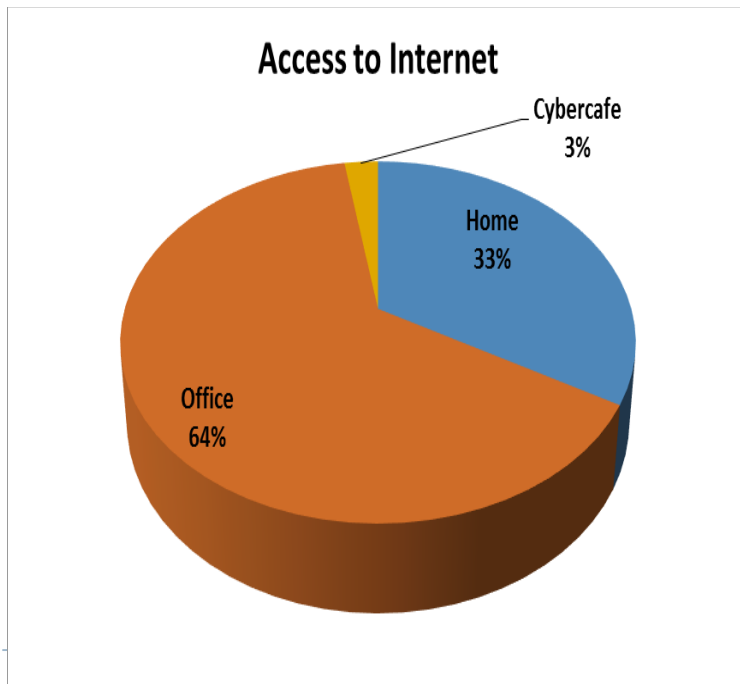


Fig.4 Access to the Internet

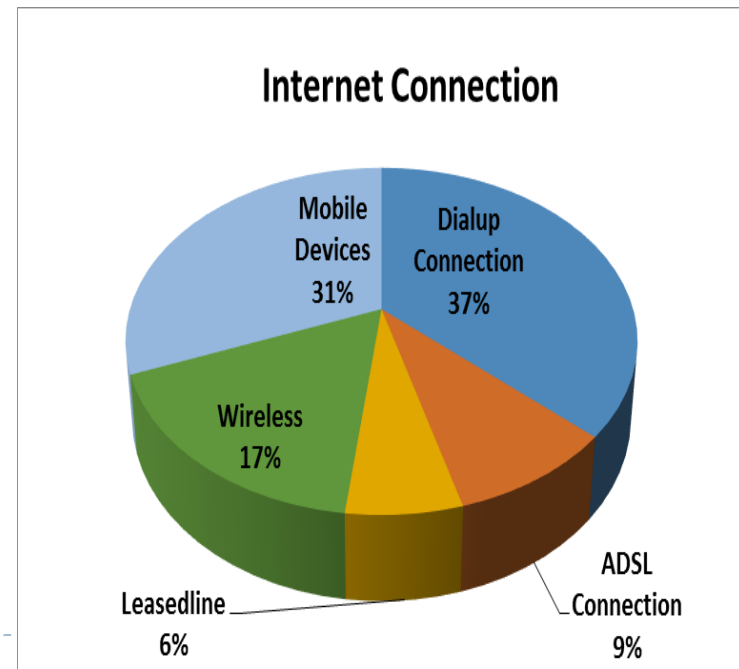


Fig.5 Internet Connection for Teachers

Devices for accessing Internet

- ▶ Majority of the teachers access Internet using desktop (57.7%) followed by smartphones(25.5%) and laptops (15.1%) with the least number accessing through tablets (Figure 6).
- ▶ some misunderstanding to question of broadband internet connectivity available on campus with some indicating no broadband. NUS has broadband internet connectivity available 24/7 to all NUS academic and teaching staff.

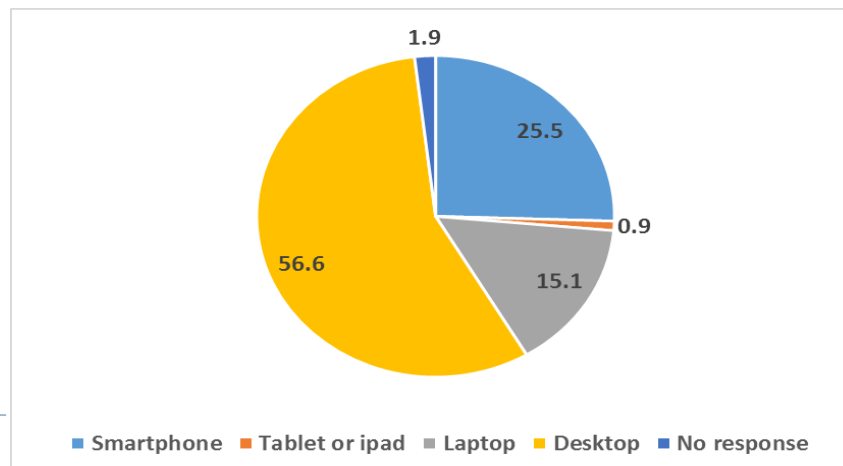


Fig.6 Device used more frequently to access the Internet

Presence of Wi-Fi/Internet Connectivity on Campus

- ▶ mixed reactions to whether there was Wi-Fi/Internet access connectivity on campus (43% indicated Yes).
- ▶ some were unaware of the presence of Wi-Fi on campus.
- ▶ Wi-Fi Internet access available at the library
- ▶ Wi-Fi Internet access also available during special workshops and conferences and setup by the ICT division upon request.



Frequency of Internet usage

- ▶ majority (about 80%) accessing daily, and with only about 3% have never used the internet (Figure 7).
- ▶ Since majority of teachers are using Internet daily, this is a positive sign in terms of moving towards technology-enabled learning.

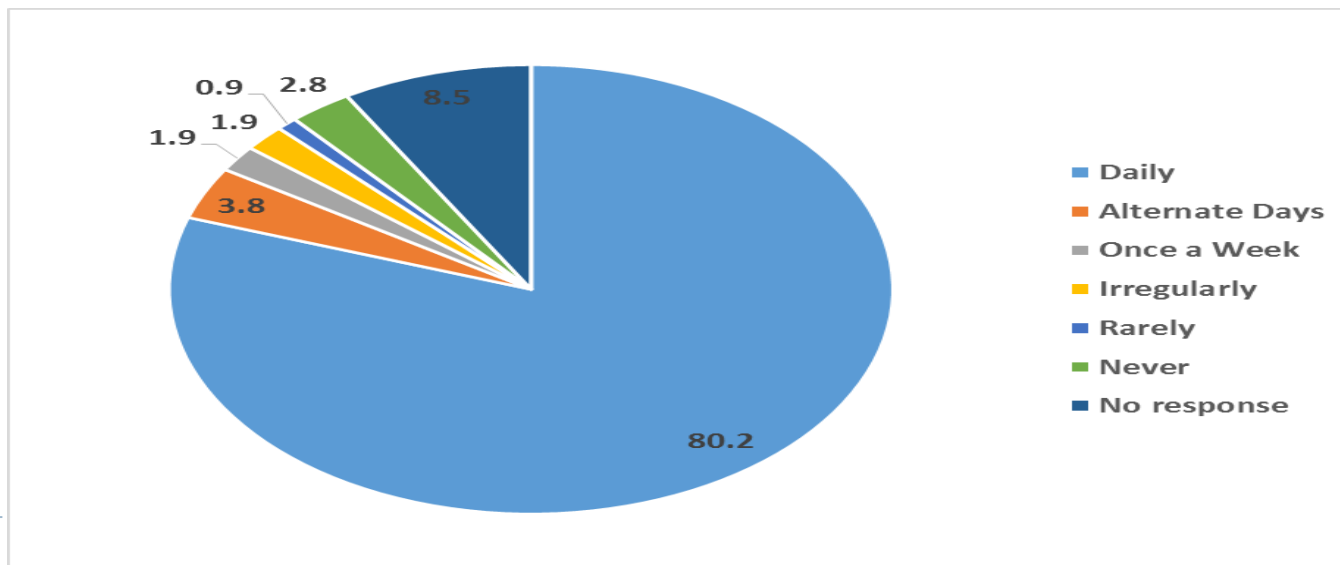


Fig.7 Frequency of Internet usage

Comfort level on the use of ICTs

- ▶ majority of teachers are expert users and can provide training in word-processing, spreadsheets, presentation software and email. This is a promising sign in terms of up-skilling staff in technology-enabled learning.
 - ▶ all of the teachers responded use email, which is another useful tool to communicate and participate in online learning.
 - ▶ number of skilled teachers diminishes and non-users increase in the areas of graphics, video and audio editing, webpage design and learner management systems.
 - ▶ These are the areas where teachers at NUS require further training to effectively use TEL.
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Further analysis

- ▶ One-way ANOVA indicated
 - ▶ significant gender differences in skill levels in word-processing, email and presentation software, with female exceeding male skill levels in these 3 computer skill categories
 - ▶ Significant differences in age groups in spreadsheets, search engines, multimedia authoring, graphic editing and digital audio with the younger age groups indicating higher skill levels
 - ▶ There were also significant differences between faculties in perceived skill levels.
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- ▶

Social Media

- ▶ 65% of total respondents indicate use of social media.
- ▶ Facebook(70%) followed by Google (58%) were the most popular social media sites.

Platform	Frequency	%
Facebook	70	27.0
Twitter	26	10.0
Google	58	23.0
Blog	7	3.0
Slideshare	17	7.0
Photosharing, Instagram/Flickr	22	9.0
Research sharing (Researchgate, etc)	33	13.0
Social Bookmarking Pinterest	13	5.0
Goodread.com	9	4.0



Social Media

- ▶ quite a few subscribing to research sharing sites (33%) such as Research gate and Academia.edu.
- ▶ findings important as need to investigate the potential of use of social media for teaching and learning.
- ▶ In terms of frequency of postings to discussion forums, 17% of teachers posting daily. However the largest proportion (34.9%) of respondents reported posting infrequently (refer Table 10).

How often do you post to discussion forums	Frequency	Percent
Several times a day	9	8.5
Once a day	9	8.5
Once a week	11	10.4
Once fortnight	9	8.5
Not very frequently	37	34.9
Not at all	16	15.1
Total	91	85.8
Missing	15	14.2
Total	106	100



Mailing Lists and Discussion Forums

- ▶ **43% subscribed to mailing lists or discussion forum with 41 subscribed to between 1 and 5 forums and 11 claiming subscription to more than 5 discussion or mailing lists.**
- ▶ about 50% of staff did not answer this question and may be due to some staff uncertainty on what mailing lists and discussion forum referred to.



Mailing Lists and Discussion Forums

- ▶ 14% of staff had experience in moderating discussion fora and mailing lists.
- ▶ However there were a range of responses to frequency of posting with 24.5% indicating infrequent postings (see Table 11).

Table. 11 Frequency of Posting to Discussion Forum and Mailing Lists

Frequency of posting to discussion forum or mailing lists	Frequency	Percent	Cumulative Percent
Several times a day	6	5.7	12.0
Once a day	4	3.8	20.0
Once a week	10	9.4	40.0
Once fortnight	4	3.8	48.0
Not very frequently	26	24.5	100.0
Total	50	47.2	
System missing	56	52.8	
	106	100	



Technology-Enabled Learning Environment

- ▶ Teachers were asked to evaluate their experiences with a range of resources/services/spaces (see Table 12).
- ▶ **On the overall the quality of the experiences with the listed services and resources were variable.**



Technology-Enabled Learning Environment

- ▶ Of note were above average responses for e-classrooms, computer labs, email services, network bandwidth/speed of internet, download and use of free and open source and support and maintenance of ICT.
 - ▶ Below average responses for wifi access, LMS, access to specialised software
 - ▶ This also indicates that in order to provide a better TEL environment, most of the services needs to be upgraded to provide better experiences.
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Section C: Using ICTs for Teaching and Learning

- ▶ **Use and Creation of Digital Content for Teaching**
- ▶ **Modes of teaching predominantly traditional (80%) with only 3% using online mode and 17% using hybrid mode.**
- ▶ This indicates that we have considerable amount of work to do towards shifting course content from traditional to hybrid or online mode.



Frequency of usage of digital resources/platforms in teaching

- ▶ Inspection of the mean responses indicates an above average frequency of usage or heavy usage of digital resources (images, presentations), Word files and open textbooks.



Frequency of usage of digital resources/platforms in teaching

- ▶ One way ANOVA procedures indicated
 - ▶ significant gender differences in use of resources such as images, presentations, digital films, audio recordings with usage for female staff greater than that for male staff in these categories.



Creation and Sharing of Teaching and Learning Resources

- ▶ **Results show (Table 14) staff had created teaching and learning resources but not shared it using Images (46%), Presentations (49%) and Word files (42%).**

Table. 14 Teacher Experience in Creating and Sharing Teaching and Learning Resources

Resource	1= never	2= Yes but not shared	3 = Yes and shared in an open license	Missing/no response
Images	14.2	46.2	30.2	9.4
Presentations	10.4	49.1	31.1	9.4
Word files	15.1	41.5	34	9.4
Digital films/video	38.7	25.5	24.5	9.4
Audio recordings	51.9	16	17	15.1
Simulations	54.7	17	17	11.3
Learner management systems	21.7	4.7	7.5	66
Blogs	65.1	8.5	10.4	16
Course packs	37.7	28.3	17	17



Creation and Sharing of Teaching and Learning Resources

- ▶ Staff who had created and also shared resources using an **open license** were fewer in numbers using Images (30.2%), Presentations (31.1%) and Word files (34%).
 - ▶ However results showed that there were some **areas where majority of the respondents had never used technologies such as digital films (38.7%), audio recordings (51.9%), simulations (54.7%), blogs (65.1%) and course packs (37.7%) for creating and sharing teaching and learning resources.**
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Awareness of OER

- ▶ **50.9% of staff were aware of availability of OER**(refer Table 15).
- ▶ large number of missing responses (27.4%) could have been due to the fact that these staff respondents were not sure what the term OER meant. This indicates the need to promote understanding of OER to move forward in implementing TEL at NUS.

Table. 15 Awareness of availability of OER

	Frequency	%
Yes	54	50.9
No	23	21.7
Total	77	72.6
Missing	29	27.4



OER Platforms and Sources

- ▶ An evaluation of how often teachers used a range of OER platforms showed that **for all the OER platforms staff usage was below average.**
- ▶ Another factor which was noticeable was the **large number of staff (all > 50%) who had never used these OER platforms.**



Table.16 Evaluation of Staff Usage of OER platforms

OER platforms/sources	1 = never	2=rarely	3= sometimes	4= often	Mean	Stddev
OER commons	59	12	14	1	1.6	1.0
Sylor academy	70	7	8	0	1.4	0.8
Wiki-educator	42	16	14	7	2.2	1.4
Openstax College	67	7	7	0	1.4	0.9
BCCampus textbooks	59	8	12	4	1,7	1.1
NPTEL India	70	6	6	0	1.3	0.8
MIT Open courseware	60	10	10	3	1.6	1.0
OpenLearn UK	64	8	11	2	1.5	0.9
CollegeOpen Textbook	58	10	13	5	1.7	1.1
Directory of Open access Journals	59	10	13	4	1.8	1.2
Directory of Open access Books	58	12	12	4	1.8	1.2
MERLOT	67	11	6	2	1.4	0.9
** N = 106						



Skills for Integrating Technology in Teaching and Learning

- ▶ Teachers asked to self-rate on a range of skills to integrate technologies for teaching and learning
- ▶ **Most of the respondents rate their skill level at very low or can't use at all.**



Table.17 Evaluation of Teachers Skills in Integrating Technologies into Teaching

Technologies	0= can't use it	1= can use small extent	2= can use satisfactorily	3= can use well	4= can use very well	Mean	Stddev
Learning Management Systems	23	11	16	5	0	1.3	1.2
Online collaboration(Google docs	24	13	19	11	0	1.7	1.3
e-Portfolio	31	23	13	13	5	1.3	1.2
e-books	17	22	19	14	0	2	1.3
Online video/audio	14	22	15	13	0	1.8	1.4
Educational games	15	21	14	8	0	1.5	1.3
Lecture capture tools	22	20	16	11	0	1.7	1.4
Accessible tools for disabled	15	15	9	4	0	1	
Using social media (wiki, blogs)	24	24	15	14	15	1.7	



Training and Staff Development

- ▶ 44 % already received training on the use of ICTs for teaching and learning.
- ▶ 37% reported that the university provides regular training on the use of TEL
- ▶ 42 % participated in online training.



Training and Staff Development

- ▶ 16% reported that they had attended massive open online courses (MOOCs).
- ▶ Results show that the majority of staff (72%) were not aware of the existence of MOOCs.

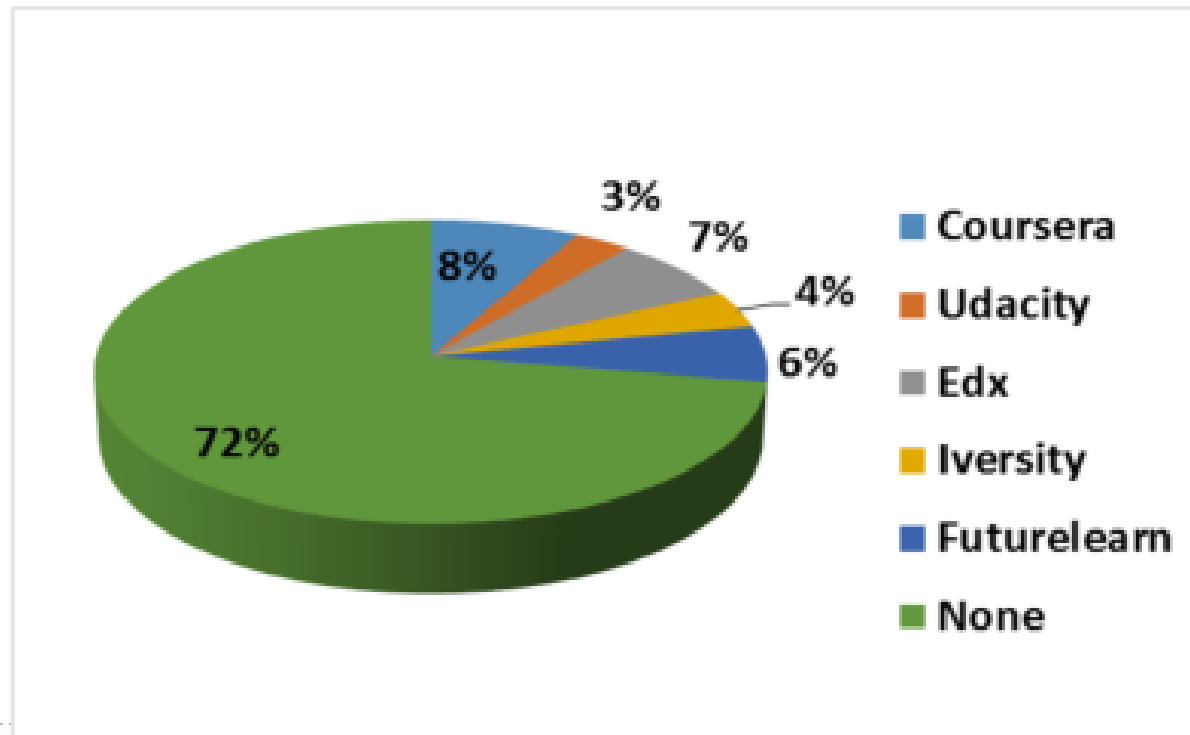


Fig.9 Awareness of MOOCs

Policy Issues for Technology-enabled learning (TEL)

- ▶ **Staff responses indicated that not all staff were clear in what policies were in place and what had yet to be instituted.**
- ▶ **Also another factor was the confusion over terms such as OER and online learning and ICT.**
- ▶ NUS does not have a policy for OER nor does it have a separate policy for data protection and privacy although there are some aspects of it in the ICT policy.



Section D: Using ICTs for Research and Scholarships

- ▶ ***Library Access to Subscription-based Resources***
- ▶ **mixed reaction to whether library provides subscription based services.**
- ▶ There were a lot of missing values due to staff not filling in this section of the questionnaire. Mostly teachers are unaware about available resources (Table 18). The library actually provides subscription based services to all library books for both staff and students, with an excellent Pacific collection.

Table.18 Does Library provide access to subscription based resources

	Frequency	%
Yes	33	31.1
No	7	6.6
Do not know	42	39.6
Total	82	77.4
Missing	24	22.6



Library Resources Used for Teaching and Learning

- ▶ Frequency of access of library resources for teaching and learning
 - ▶ **e-books usage and citation databases are above average (values above 3) but for the remaining digital resources, usage is low.**
 - ▶ **The findings also suggest that library usage by teachers is relatively low and is a point of concern. However the large number of missing values also affected the outcomes.**
-



Availability of Research support

- ▶ Results shows that with the exception of access to data resources, access to all other categories as listed in Table 20, are below average, indicating low levels of research support in these categories.
- ▶ As typical in developing universities, the issue of license costs of proprietary software has always been a challenge.



Table.20 Availability of Research Support

Resources/services/spaces	0=not available	1=poor	2=fair	3=neutral	4=good	5=excellent	Mean response	Stddev	N
Access to data storage	7	17	19	17	22	7	2.6	1.4	89
Data visualisation software	13	22	18	17	14	3	2.1	1.4	87
Citation/reference software	16	24	12	15	19	2	2.0	1.5	88
Plagiarism detection	22	25	16	9	12	3	1.7	1.5	87
Institutional repository for sharing research	15	24	16	13	16	2	2.0	1.5	86
Funds to support open access publication	12	28	16	15	15	1	2.0	1.4	87



Section E: Perceptions on Use of Technology-Enabled Learning

- ▶ Perceptions of staff on the use of technology-enabled learning assessed by evaluating staff attitudes to a variety of statements by using Likert scale
- ▶ **the mean responses for all items were highly positive with all mean responses well above average** (Table 21).
- ▶ Further analysis using one-way ANOVA procedures showed no significant differences in staff perceptions based on gender, age or faculty .



Table.21 Perceptions/Attitudes of Staff to Use of Technology enabled learning

Statements	1= strongly disagree	2= disagree	3= neither disagree nor agree	4= agree	5=Strongly agree	Mean response (for N = 90)	Stddev
Technology-enabled learning can solve many of our educational problems	0	6	7	44	33	4.2	0.8
Technology-enabled learning will bring new opportunities for organizing teaching and learning	0	0	5	41	44	4.4	0.6
Technology-enabled learning saves time and effort for both teachers and students.	0	2	8	37	43	4.3	0.7
Technology-enabled learning increases access to education and training	0	1	3	41	45	4.4	0.6
Technology-enabled learning will increase my efficiency in teaching.	0	2	9	41	38	4.3	0.7
Technology-enabled learning enables collaborative learning.	0	3	5	45	37	4.3	0.7
Technology-enabled learning can engage learners more than other forms of learning	0	1	21	39	29	4.1	0.8
Technology-enabled learning increases the quality of teaching and learning because it integrates all	0	1	4	43	40	4.4	0.6

Motivation to Use Technology-Enabled Learning

- ▶ A second probe on teachers motivation to use TEL was done using with a Likert scale with several items with responses ranging from 1= very weak motivator, 2= weak motivator, 3 = average motivator, 4= strong motivator and 5= very strong motivator.
- ▶ All of the items evaluated were strong motivators with mean of the individual responses all above average and ranging from 4.0 to 4.4 (Table 22).
- ▶ .



Table.22 Motivators to Technology-Enabled Learning

Motivator items	1=Very weak	2=weak	3=average	4=strong	5=very strong	N	Mean	Stddev
Personal interest to use technology	0	3	11	35	39	88	4.3	0.8
Intellectual challenge	0	4	13	38	34	89	4.2	0.8
Self-gratification	2	5	13	37	28	87	4.0	0.9
Training on technology-enabled learning	0	2	10	37	39	88	4.3	0.8
Better Internet bandwidth at workplace	0	2	10	20	47	89	4.4	0.8
Credit towards promotion	0	5	17	28	39	89	4.1	0.9
Professional incentives to use e technology-enabled learning		5	12	33	39	89	4.2	0.9
Technical support	0	1	10	34	43	88	4.4	0.7
Peer recognition, prestige, and status	0	1	2	15	39	87	4.1	0.8
Improved infrastructure (hardware and software) deployment	0	1	8	35	43	87	4.4	0.7
Release time/Reduction in existing	0	2	14	37	46	89	4.2	0.8

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Professional incentives to use e technology-enabled learning		5	12	33	39	89	4.2	0.9
Technical support	0	1	10	34	43	88	4.4	0.7
Peer recognition, prestige, and status	0	1	2	15	39	87	4.1	0.8
Improved infrastructure (hardware and software) deployment	0	1	8	35	43	87	4.4	0.7
Release time/Reduction in existing workload	0	2	14	37	46	89	4.2	0.8
To be a	0	6	16	33	33	88	4.1	0.9

Barriers to Use of Technology-Enabled Learning

- ▶ **all of the factors identified as barriers were strong barriers**
- ▶ major barriers
 - ▶ lack of instructional design support
 - ▶ and lack of hardware and software
 - ▶ concern about student access to technology
 - ▶ lack of time to develop e-courses



Section F: Comments on The Need to Develop a TEL Policy for NUS

- Teachers were asked to comment on the following statement:
- ▶ *“There is a need to develop a technology-enabled learning policy and strategy in your university”*
- ▶ All of the 47 staff respondents who responded to this open question strongly agreed on the need for a Technology enabled learning policy.
- ▶ Comments for the policy included:



The Need to Develop a TEL Policy for NUS

- ▶ *“...there is a need to develop and implement one[policy].The needs of our students are changing rapidly due to technology,in addition in order to ensure the integrity of work submitted by students, therefore access to plagiarism software is a start.There is a need to transform the delivery of education to influence shape and form of the future workforce”*
- ▶ *“This should be developed to ensure structures and systems are appropriate, and it will effectively facilitated the tasks and responsibilities. It addresses the development of learning opportunities that utilise these systems in ways that enhance the university to achieve a sustainable future in a continuously transforming technological context”*
- ▶ Hence the responses indicate a strong consensus of teachers on the need for a TEL policy.



Summary & Conclusion

- ▶ To conclude following are a summary of the findings and recommendations:
- ▶ NUS is in the early stages of technology-enabled learning with some improvements needed in its technology infrastructure and support services.
- ▶ In terms of skill levels, staff were quite proficient in common applications such as word-processing, spreadsheets, email. However further capacity building of teachers needed in advanced ICT such as video editing, graphics



Summary & Conclusion

- ▶ Teachers also need more training on use of OER and LMS.
- ▶ In terms of attitudes towards technology enabled learning staff showed very positive attitudes towards the use of technology in teaching and learning. Staff obviously knew the value, potential uses and benefits of technology.
- ▶ Responses also showed overwhelming consensus of the need to develop a TEL policy for NUS



Future directions

- ▶ So where to from here????
- ▶ In Next 3 years activities are:
- ▶ Other TEL initiatives at NUS e.g. FOS workshops Moodle, Opensys, webdesign, use of drone in teaching, Raspberry pi
- ▶ Development of TEL/OER policy for NUS
- ▶ Teacher workshops in OER, LMS and course development
- ▶ Teachers to reorient existing courses to deliver using technology
- ▶ Impact study (post test) in year 3 to assess effectiveness of technology enabled learning (TEL)

