CENTRE FOR INFORMATION SYSTEMS ANNUAL REPORT 2020/21

CENTRE FOR INFORMATION SYSTEMS

THE UNIVERSITY OF NIZWA. SULTANATE OF OMAN

AUGUST 2021

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EXECUTIVE SUMMARY

The Centre for Information Systems (CIS) continues to accommodate the ongoing tasks for the University of Nizwa community, by providing and managing IT services and products. The academic year of 2020/21 was a challenging year due to the implementation of online distance learning for all courses. This is due to the COVD-19 pandemic that started in Mar 2020.

The CIS organizational structure witnessed minor changes due to the resignation of one Helpdesk technician and a replacement for the technician. The accumulative number of CIS staff members stood at 19.

The Helpdesk continues to provide troubleshooting services to students and staff members. However, due to the absence of students and faculty members on the campus, the number of incidences and support events had significantly decreased.

Due to significantly higher IT usage during the pandemic, bandwidth, and systems has to be upgraded. The Systems and Application Unit were heavily involved in upgrading the servers and systems to cater to the increase in demand. Similarly, the Network and Security Unit were occupied with making sure the network is running 24/7. This unit was also involved in troubleshooting the network whenever CIS receive complaints regarding accessibility.

The E-Learning Unit continues to provide technical support to students and faculty members. Most are done via e-mail and phone. The unit has to provide support to the teachers who are teaching a total of more than 1000 online courses and related systems such as the Turnitin and Google Meet

The annual satisfaction survey conducted by CIS was introduced in July 2021 and closed on 1 August 2019, targeting the faculty members, administrative staff, and students. 735 students, 78 faculty members, and 29 staff members responded to the survey.

The following pages of this report provide further details concerning CIS activities and achievements for the academic year of 2020/21.

1. INTRODUCTION

The year 2020/21 has been a challenging year for the Centre for Information System (CIS) mainly due to the implementation of online distance learning due to the Covid-19 pandemic. This mode of teaching and learning started in March 2020 and continues until the end of the academic year 2020/21.

The main challenge of to provide services to almost all faculty members including those who have not experienced online distance learning before. Getting them familiar with the learning management system took a lot of time and effort. In addition, the CIS has to source for suitable easy to use video conferencing platforms. Several platforms were tested including BigBlueButton, Google Meet, Microsoft Teams, and Zoom. The capacity of the in-house servers was enhanced to cater to the increased number of access from outside the campus and the increased server load during peak periods such as the examination.

Important Figures

Administrative staff	635
Students	6000
Faculty members	375
Computers	976
Zero Client	610
New students	1563
Leave requests	2291
Client computers	1574

CIS was also overwhelmed with the request for technical support from the faculty members and students. Most of this support was carried out via the telephone or e-mail due to the Covid-19 pandemic. CIS also focused more on writing guidelines mainly on common issues faced by the faculty members and students in using the LMS.

We received a new staff for Helpdesk to replace a technician who resigned from the position. As such the number of CIS staff members stood at 19 in Summer 2020/21

2. TEAM MEMBERS

1:356	1	1
CIS Staff to Faculty and Student Ratio	Resignations	New Staff

CIS's overall staff number stands at 19. This year registered one recruitment for the Helpdesk Unit, to replace a staff who left the University. **Error! Reference source not found.** provides an overview of the staff distribution over the past 10 years. The distribution of staff according to CIS Units are shown in **Error! Reference source not found.**. Appendix A shows the organizational chart of CIS.

Table 1. Number of Staff Members (2010-2021)

Year	Total	Recruited	Resigned	Transferred	Have Degree	Male	Female	Helpdesk Members	Study Leave
2010	23	1	0	-	5	21	2	12	0
2011	24	4	4	-	8	20	4	12	1
2012	27	2	0	-	11	22	5	13	1
2013	29	2	0	-	12	23	6	14	3
2014	27	2	4	-	14	19	6	11	1
2015	22	1	6	-	12	18	4	11	0
2016	23	4	3	-	13	17	6	10	0
2017	21	1	0	-	14	14	7	7	1
2018	18	0	3	-	12	11	7	5*	1
2019	17	1	1	1	14	11	6	4	0
2020/21	19	1	1	-	15	14	5	5	0

Table 2. Number of Staff Members (2021)

CIS Units	Number of Staff
Helpdesk	5
Network and Security	5
Systems and Applications	6
E-Learning	3

Table 3. Important Figures/Ratios

Ratio	2017/18	2018/19	2020/21
IT Staff/Student (Ratio)	18/6459 (1:358.8)	17/6050 (1:355.8)	**19/6000 (1:315.7)**
IT Staff/All Users (Ratio)	18/6970 (1:387.2)	17/6761 (1:397.7)	**19/7010 1:369**
IT Staff/Computer (Ratio)	18/2226 (1: 123.6)	17/2321 (1:136.5)	**19/2321 1:122.2**
Computer Labs	33	34	**34**

Looking at the ratio in Table 3, the ratio of CIS staff to the student has decreased from 1:355.8 in 2018/19 to 1:315.8 in the current year. The ratio of CIS staff to all users of UoN is decreasing from 1:397.7 to 1:369. The number of Computer labs increased to 34 remains the same

3. HELPDESK

45	3,010	953002	160115
Supported Events	Incidents	Black and White Copies	Color Copies

Due to the COVID-19 pandemic, Helpdesk tasks are more focused on maintaining existing PCs and devices. The number of PCs and devices remains relatively the same as the previous years due to the absence of students from the campus and most teachers are teaching from home.

The Helpdesk Unit's goal is to provide IT support to faculty members, staff, and students including the hardware installation, equipment for learning spaces, printing services, and troubleshooting. The Helpdesk Unit strives to support effectively all users in the initial campus, new campus, UONIF, and Al-Khwair office. Five staff members are currently working for the unit.

The unit provides troubleshooting, consultation, printing, learning technology support, and various other services related to hardware and software solutions. The unit is responsible for maintaining the computer labs around the campus, including the open-access computer labs such as Al-Fiker labs (see **Error! Reference source not found.**). No changes in the number of labs and PCs in the labs. This is due to the absence of students because of the pandemic and the implementation of online learning.

The number of the recorded incidents that have been attended by Helpdesk was 3,010. The total number of incidents attended by all staff in CIS reached 5,497

976 PCs across the campus are dedicated to 6000 students giving a ratio of the PC to the student of 1:6. The total number of PCs remains the same as 2018/19 at 2321 (Table **3**), due to the absence of students on the campus. Although these are not relevant during the pandemic period, the Helpdesk continues to maintain the PCs in preparation for the next academic year when students may be coming back to the

campus.

Table 4. Number of Computer Labs

Lab Name/Location	No of Labs	No of Computers
Common Teaching Labs	5	154
CAS	4	105
CEMIS	1	25
CEA	6	100
CPN	4	53
Foundation	10	320
Free Access labs	4	219
TOTAL	**34**	**976**

MAJOR DEVELOPMENT

1. Four brand new printers replaced the outdated printers for several departments around the campus.
2. Thirty personal computers were replaced with new ones.

CHALLENGES

1. The Team finds it challenging to entertain the requests and incidents considering the significant drop in the number of staff.
2. Financial support is suppressing the expansion of some developmental plans.

FUTURE PLAN

1. It is planned to change 50% of outdated PCs with the new units to better facilitate the students' learning experience and staff administrative tasks.
2. The VGA cables will be changed to HDMI cables, to ensure the compatibility of the available resources with up-to-date technologies.
3. Continue the project of equipping the remaining classrooms with PCs.

4. SYSTEMS AND APPLICATIONS

30,426	3 million	610
UNIZWA Email Users	UNIZWA Website Hits	Zero Clients

Systems and Applications Unit provides support to the Core Infrastructure Systems. This includes setting up and maintaining university enterprise systems including the student information systems, learning management systems, library systems, and the university website developing, maintaining, and upgrading the systems. The systems include Eduwave with 1,563 new students, WaveERP that recorded 2,291 leave requests, and email for 30,426 users. Additionally, the unit also maintains backup processes and maintains the operating systems for the PCs and Zero Client computers. A list of the core systems is available in Appendix B.

CIS in-house developers contributed to developing 15 applications that facilitate the administrative processes. The developed applications were requested by the VCAA, Colleges, DPQM Deanship of Students Affairs and Society Service, Human Resource Department, Vice Chancellor for Graduate Studies Research and External Relations, Deanship of Record and Registration, and CIS. Appendix C lists the developed applications.

MAJOR DEVELOPMENT

1. The main Storage Unit of Sun Oracle that served for the last seven years was replaced with a new Storage Unit by Fujitsu. The replacement decision was rendered due to several faulty Hard Disk incidents and hardware failure. The sensitivity of the data kept in the old Storage Unit necessitated the replacement too, for further security purposes and to protect the stored data that nurturing the core systems.
2. As the number of the online examinations designed in Moodle increased the Moodle server was maintained to improve its capacity to handle the increased

demand. Moodle online exams recorded access of (266) students at the same time to attempt the online exam, which caused server hang. Therefore, new setups were followed and the Moodle server got configured to solve the issue to enhance the smoothness of the online examinations.

3. The NCR system was upgraded by adding a new feature that allows the students to pay (other fees) by using the kiosk machines. This new feature boosts the accessibility and usability of the machine.
4. Development of Assets Management System for the Finance Department to manage the assets of the university. It contains different types of assets like furniture, ICT equipment, scientific equipment, and devices. Assets Management System helped to generate reports for the administration.
5. Development of the Graduate System, that's designed to organize the attendance of graduates, schedule the ceremony program, organize the roll-call and graduates exit survey and analysis.
6. The reporting server was rebuilt after analyzing the previous requests of extracted reports from the different departments of the university. This provides the efficiency to archive and retrieves reports.
7. The team is working closely and intensively for the Integration project between the databases of the university and MOHE. This integration would ease communication to exchange student and staff data between the two parties. It also contributes to the accuracy and validity specifications of the users' data.
8. Similarly, the team is working on another national project that aims to integrate the data between Higher education institutions and ROP. This particular project helps to verify the veracity of the entered data, and provide the biodata of the enrolled students and employed staff.
9. Developed a system for the VCAA to manage the evaluation of courses and instructors of the last 5 years and provide feedback on student evaluation of teaching and learning effectiveness.
10. Developed an electronic Grade Appeal System for the colleges to allow students to submit grade appeal requests that go to college HoD, Evaluator, and Grade Appeal Committee. The decision is sent electronically to the Deanship of Record and Registration to do the change on Eduwave.

CHALLENGES

1. Following up with the changeable users' requirements, and provide the compatible technologies that facilitate the learning needs and administrative procedures.
2. The scarcity of the financial support to renew the signed contracts resulted in pending payments, delaying upgrade plans, and termination of some services.
3. Shortage of manpower in other CIS Units increases the working load of the Unit's members to provide backup support to other units.

FUTURE PLAN

1. Unification of the passwords of the Gmail, Eduwave, and Active Directory applications. To make it easy for the users to use one password for different applications.
2. Upgrade Sun Oracle VDI servers (10 servers). These servers are outdated and affecting their functions
3. Extend the word of the Change Password Application(PWD) to serve the staff. Currently, it is only for students.
4. Develop a new system for the HR department for the recruitment of new staff.
5. Develop a new application for the DPQM to manage the grievance.

5. NETWORK AND SECURITY

271	450Mbps	11.3k	5.7k
Wireless access points	Bandwidth	Concurrent Connected Devices	Network Points

The Networking Unit's main responsibilities are to set up and maintain a secured network environment for faculty and students and to monitor the usage of the facilities in both the initial campus and the new campus.

More specifically, the major tasks are:

1. Setup, monitor and maintain the Local Area Network (Network structure, switches which are distributed in communication rooms in all buildings, and Datacenter);
2. Ensure Security (Unified Threat Management UTM, Anti-virus, CCTV Camera, door access control, and Road Barriers)
3. Setup and maintain communication devices (IP phone and fax); additionally
4. Setup and maintain wireless devices throughout the campus and hostels

The number of unit staff remains the same. Discussions sessions among the team members were carried out to ensure the transfer of knowledge to overcome any issues related to staff shortage and resignations.

Currently, the University subscribed to 300 Mbps from Omantel and 150 Mbps from Ooredoo (**Error! Reference source not found.**).

Table 5. Internet Bandwidth 2011-2021

ISP\Year	Omantel	Ooredoo
2010	16Mbps	-
2011	34Mbps	-
2012	34Mbps	-
2013	34Mbps	34Mbps
2014	34Mbps	34Mbps
2015	68Mbps	34Mbps
2016	150Mbps	150Mbps
2017	150Mbps	150Mbps
2018	150Mbps	150Mbps
2019	150Mbps	150Mbps
2020	300Mbps	150Mbps
2021	**300Mbps**	**150Mbps**

MAJOR DEVELOPMENT

1. The DMZ switches were replaced with a new one because it no longer supported by the vendor and are out-of-date. In addition, the port uplink does not support more than one gigabyte of data.
2. Upgrade the fiber uplink between DC_BN-8 and DC bn-26 from 1GB to 10GB by replacing the old cable.
3. Add more wireless Access points to cover the important place on campus. The number of access points increases from 261 to 271.
4. The Firewall life ended and was replaced with a new one with an additional security application to avoid any potential threats.
5. Add a new version of the camera in turnstile (face recognition) to detect the students' movement inside the campus and to detect those who exited the campus.

6. Replaced the analog camera with IP camera and the DVR with NVR system. In addition, new cameras were installed to cover important areas that were not covered before.
7. New road barriers and door access readers were added to the current system for security and safety reasons.

CHALLENGES

Challenges in 2019/20

1. The call manager stopped the backup process due to a missing configuration in the local server
2. Damaged old switches have to be replaced individually.
3. Some Door Access module was damaged and giving problem in accessing certain areas. The damage may be due to the power failure.
4. Some features in the Fortigate firewall stopped working due to the failure to upgrade by Fortinet. This has affected access to some websites and services such as the WaveErp and Print services

Challenges in 2020/21

1. Google Meet problem where students were not able to hear sound nor see the shared screen. This has caused problems for the lecturers and students during their online sessions
2. Users were not able to connect to the campus Wi-Fi due to the expired (public) certificate
3. Kaspersky was not able to be deployed on some PCs due to some virus
4. The firewall security profile stopped working and blocked some services and websites such as the Print services
5. Wireless support has ended and we are searching for a new vendor with the right skills and knowledge at the right price.
6. There are 3 solutions for door access control. The decentralization between these three solutions is challenging and needs to be unified.
7. The continuous changes in the configurations setups require PAM and effective SIEM solutions, which provide better security and control.

8. The current cascading network design is challenging because any failures in configuration or power lead to whole network disruption. (redundancy core switch and firewall)
9. The team needs continuous developmental training programs to increase the efficiency of the staff, and add skills needed to deal with the upcoming technical issues.

FUTURE PLAN

1. To Deploy the PAM and SIM solutions that control access and configuration changes. These solutions help to track logs for troubleshooting. Importantly, they control access and manage the changes in configuration settings.
2. To replace the outdated 500 series switches with a new one dedicated for enterprise level.
3. To request a specialized training plan for the team to advance their skills and knowledge with the latest technologies and techniques
4. To avoid any failures in the network we plan to have redundancies for the main devices such as core switch, firewall, and distribution switch.
5. To avoid any power failures in DS, we need to add more USB battery and generator redundancy in both Data Center

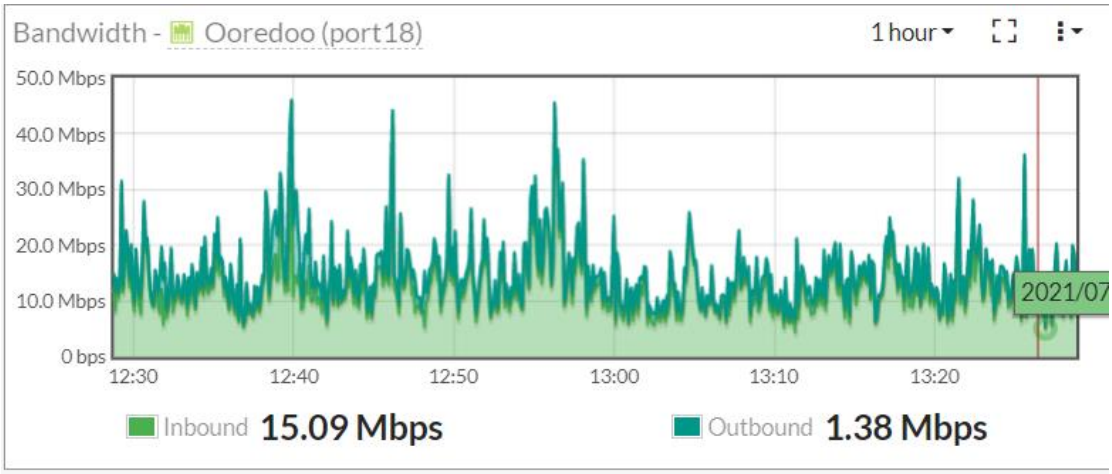


Figure 1. Sample of the Utilization of Internet Leased Line ILL from Ooredoo (wireless network)

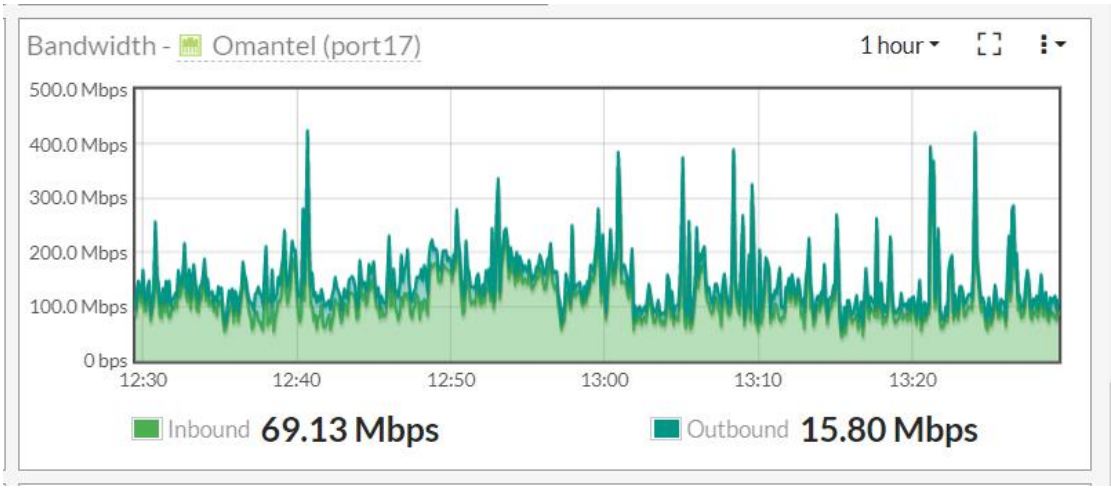


Figure 2. Sample of the Utilization of Internet Leased Line ILL from Omantel (landline network)

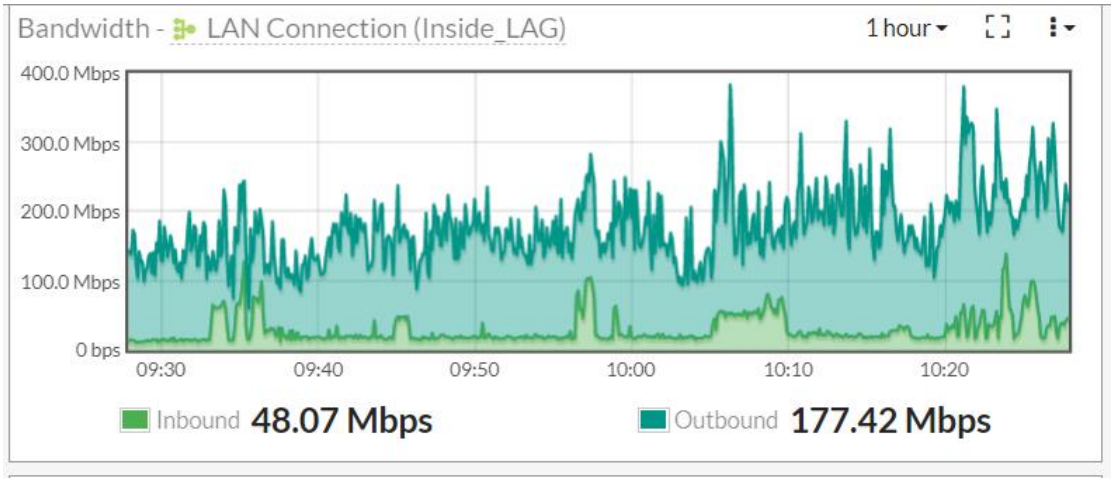


Figure 3. Sample of the Utilization of Internet Leased Line ILL from Omantel (Inside Lan)

6. E-LEARNING

36,041	1,270	13
Student-Courses	**Courses (Fall)**	**Training Sessions**

E-Learning unit's task is to promote technology-based teaching and learning by providing support to the faculty members and students including training on learning management systems and content development. The E-Learning unit provides the related technical assistance of the instructional technologies supported by the University. Most of the assistance is provided based on the requests by users.

The Covid-19 pandemic continues to force the University to implement online distance learning for all courses. A total of 1270 courses were created in Moodle. To ease the implementation of video conferencing, To enhance the functionality of the Moodle LMS, two integration were done; with Google Meet and Turnitin was integrated with Moodle. Moodle was upgraded to cater to the increasing number of users and usage.

MAJOR DEVELOPMENT

Major developments in the E-Learning Unit are listed

Google Meet integration

We arrived at Google Meet integration after testing some video conferencing solutions. The integration was done in cooperation with the Systems Unit. The integration helped teachers to schedule the virtual classes, notify students, and display recordings in Moodle. To support the users, user manuals were created and training workshops were conducted and recorded.

Turnitin integration

Turnitin integration with Moodle was implemented in Fall 2020/21. The integration enables Turnitin to check the similarities within Moodle Assignment. Similarity percentages are displayed in Moodle without having to go to Turnitin. The

integration has encouraged students and teachers to use Turnitin as can be seen in the number of document submissions and similarity reports generated by Turnitin.

Guides

The unit continues to develop user guides. New guides are written whenever there are queries about Moodle that still do not have a guide written on them. Collection of guides are kept in Moodle.

Moodle upgrade

With the increase in the number of created courses and active users, the team has considered the platform upgrade to enhance performance. In Spring 2020/21 Moodle was upgraded from 3.7 to 3.10 version. It was decided to start a new environment for Moodle with a completely new setup and infrastructure. Hence, the previous Moodle (Fall Moodle) is left up for teachers to access and transfer needed content at their convenience, and it is planned to keep it this way until Fall 2021/22. Teachers were guided through user manuals and training sessions on how to use Moodle 3.10 features and how to transfer content from Fall Moodle.

Moodle upgrade was monitored closely and tightly to ensure that none of the previous platform challenges still exist. It was noticed that the new release is capable of holding a bigger number of concurrent users than before particularly in quizzes

Bulk course creation

Before Spring 2019/20, Moodle courses were created as per request, for teachers who would like to follow the blended learning approach. When the pandemic started and students' attendance got suspended there was a need to shift all academic programs to an online space. The E-learning team immediately reacted to the event and created all offered courses on the Moodle platform. This bulk course creation was done for the first time in Spring 2019/20, and it turns to practice during the following semesters. The process includes enrolling assigned teachers and creating enrollment keys for student self-enrollment. The bulk course creation continues until In 2020/21.

Students bulk enrollment

Students' bulk enrollment is another major task the Unit is handling. Students' lists are uploaded to Moodle upon the finishing of the Add & Drop period of each semester. This was decided to avoid incomplete participant lists in each course and to make it easier for students who never experience online learning before Spring 2019/20.

Moodle enhancement

Moodle platform allows expansions that promote better performance to meet teaching and learning demands. These enhancements can be implemented through plugins added to Moodle. Throughout this academic year, several requests to add features were attended by adding more plugins. Adding a plugin to the platform is a process that requires further testing and dry-runs before the actual implementation. some of the recently added plugins are:

a. Multiple T/F
b. Attendance
c. Concurrent user access
d. Plagiarism policy
e. Freehand drawing
f. Formulas

CHALLENGES

Workload

The workload of the E-Learning Unit staff members significantly increased during the pandemic. This can be seen by the number of email communication in certain months during the pandemic (Figure 4). There is a sudden increase in the number of emails at the start of the pandemic when Emergency Remote Teaching (ERT) was implemented. The number of emails increases to 1897 in April 2020 compared to only 1183 in February and 1259 in March 2020. The total number of emails in September 2020/21 (1555) is much higher than the same month the year before (1186).

The number of phone calls slightly increased in certain months (Figure 5). However,

the increase is not as significant as the increase in the number of emails. In 2019/20 the number of calls peaked at 997 in March 2020 and in 2020/21 the number peaked at 1053 in February 2021. The insignificant increase is due to the implementation work from home strategy to curb the spread of the virus.

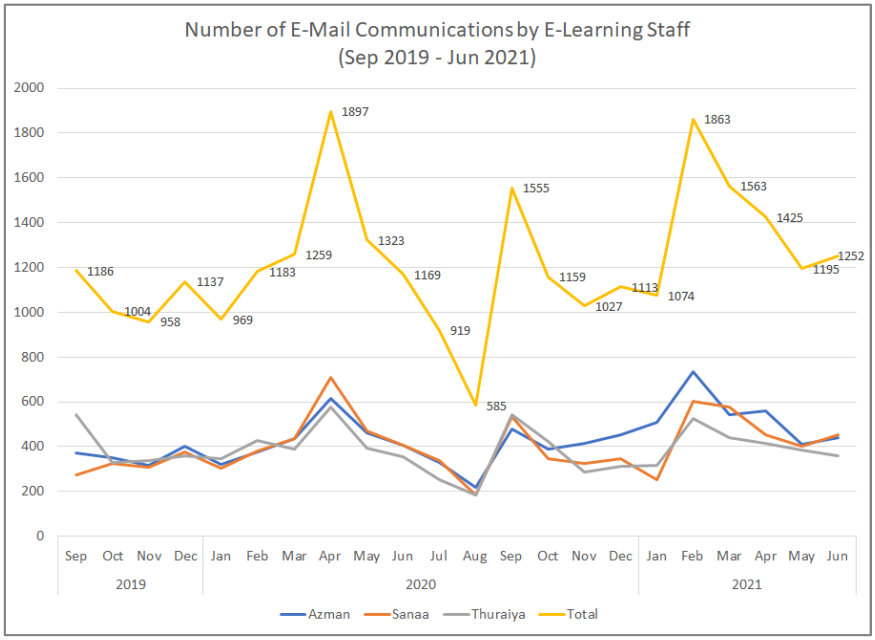


Figure 4. Number of e-mail communications by E-Learning Unit staff members

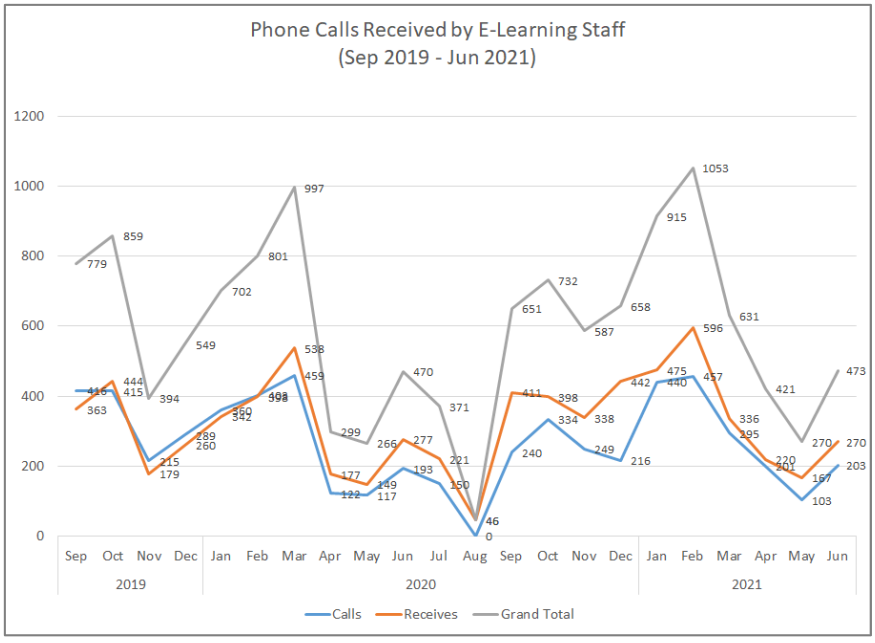


Figure 5. Number of phone calls made and received by E-Learning Unit staff members

Server Capacity

One of the biggest challenges in 2020/21 was the ability of the Moodle server to support the increased number of Moodle users. The server capacity was not able to cater to the increase in the number of online activities, in particular the quizzes. A temporary solution was implemented in Fall 2020/21 with the help of CutterGroup, UK. A more permanent solution was implemented in Spring 2020/21 where a new installation was done and Moodle was upgraded to 3.10 from the previous 3.7. Server capacity was increased to 14 CPUs and 24 GB of RAM.

FUTURE PLAN

1. A training plan has been set to better entertain training requests by users, and to provide a comprehensive training schedule that covers most of the supported instructional technologies. The training plan is designed to train groups or individuals to guide them from the orientation phase to the implementation phase of the technology in the real learning space.
2. The unit is currently in the process of upgrading Moodle to the new version 3.7. The new version is containing several features that enhance the students' learning experiences and the teacher teaching practices
3. To send E-Learning staff for training in specific areas such as Module Writing, Train the Trainer, and Online Courses Design.

Table 6. Number of Courses in Moodle (2015/16- 2020/21)

College	Fall 2015/16	Spring 2015/16	Summer 2015/16	Fall 2016/17	Spring 2016/17	Summer 2016/17	Fall 2017/18	Spring 2017/18	Summer 2017/18	Fall 2018/19	Spring 2018/19	Summer 2018/19	Fall 2019/20	Spring 2019/20	Summer 2019/20	Fall 2020/21	Spring 2020/21	Summer 2020/21
CAS	36	34	7	51	52	8	51	51	5	59	64	8	54	498	166	695	660	158
CEMIS	6	4	0	2	2	1	5	10	3	13	7	1	12	149	74	173	177	80
CPN	14	19	9	51	59	7	52	47	5	35	31	8	31	66	38	118	108	38
CEA	14	11	5	12	14	4	16	8	0	8	5	0	6	107	11	132	123	4
FI		4	7	7	11	11	6	5	0	4	8	7	35	61	17	152	161	24

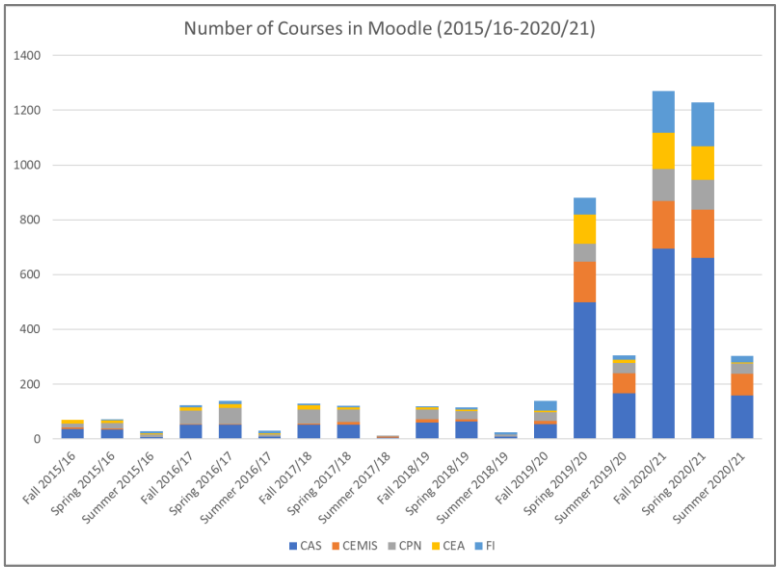


Figure 6. Number of Courses in Moodle (2015/16- 2020/21)

Table 7. Number of Students

College	Fall 2015/16	Spring 2015/16	Summer 2015/16	Fall 2016/17	Spring 2016/17	Summer 2016/17	Fall 2017/18	Spring 2017/18	Summer 2017/18	Fall 2018/19	Spring 2018/19	Summer 2018/19	Fall 2019/20	Spring 2019/20	Summer 2019/20	Fall 2020/21	Spring 2020/21	Summer 2020/21
CAS	3635	3703	1304	4039	3698	1022	3083	3022	819	3425	3428	1124	3748	16058	6360	20737	18141	6647
CEMIS	227	170	0	109	79	0	160	363	44	447	330	84	399	4438	1791	5326	5041	2218
CPN	377	434	175	1275	1132	188	1010	814	147	695	582	204	570	1485	600	2707	2114	690
CEA	345	293	96	345	271	60	306	68	0	101	39	0	42	1028	110	1345	1333	131
FI	1084	1159	397	1247	1413	775	979	226	0	285	629	164	1224	1650	258	5926	7664	363

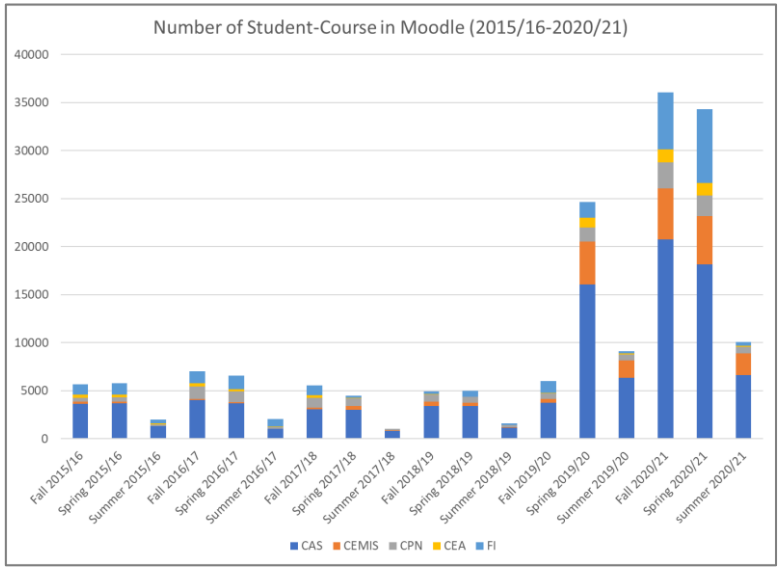


Figure 7. Number of Student-Course in Moodle (2015/16 – 2020/217

7. TURNITIN

Turnitin, the originality checking platform gaining popularity among instructors, postgraduate students, and final year projects students. Users use it to enhance the quality and originality of the written work and detect any potential plagiarised texts. Turnitin promotes high standards of academic writing. Figure 9 illustrates the increase in the number of submitted documents by all users over the past five years. Figure 10 represents the total number of active instructors in TURNITIN from the year 2013/14 up to the current academic year.

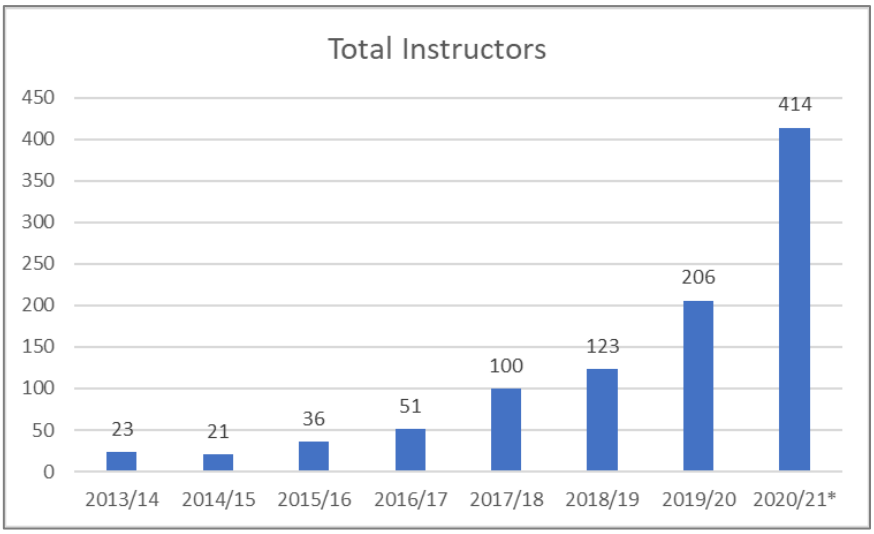


Figure 8. Number of Instructors Using TURNITIN (2013/14- 2020/21)

**Up until 11 July 2021*

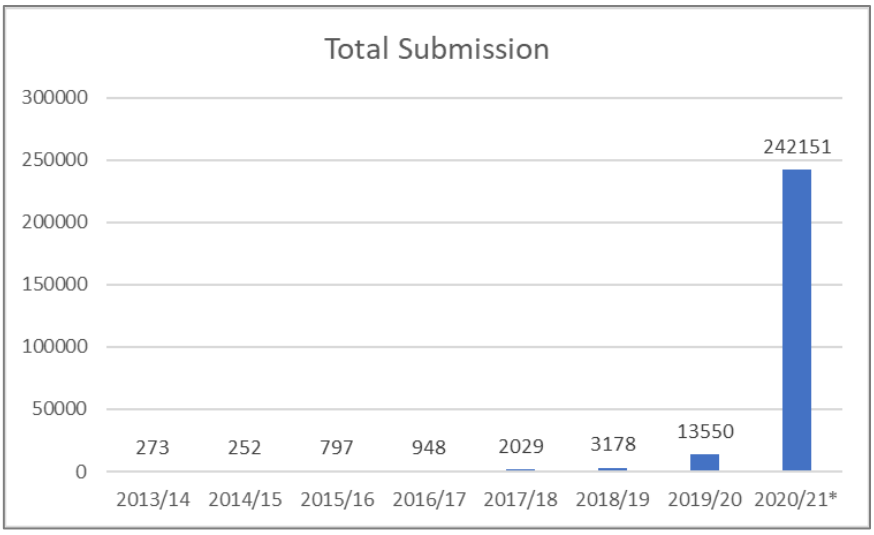


Figure 9. Total number of submitted documents in Turnitin (2013/14- 2020/21)

**Up until 11 July 2021*

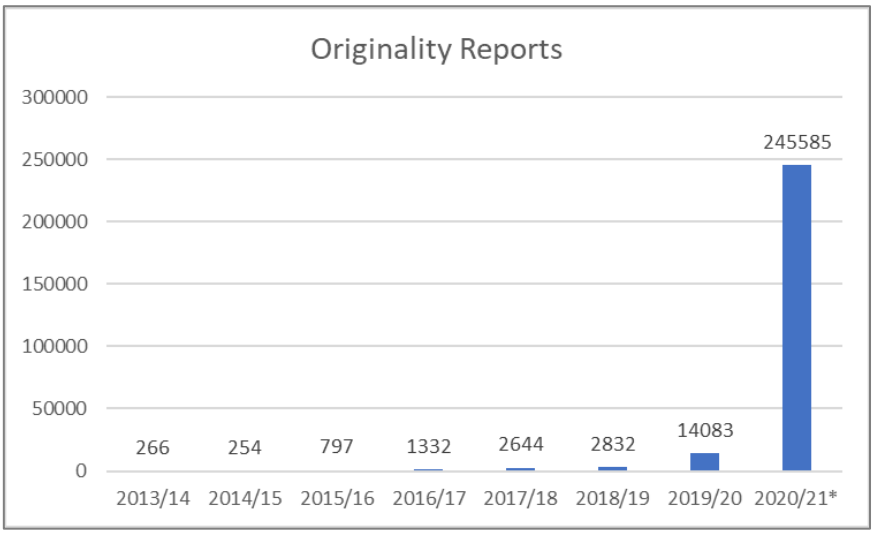


Figure 10. Total number of similarity reports in Turnitin (2013/14- 2020/21)
(*Up until 11 July 2021)

8. TRAINING

E-Learning Unit provided 13 training sessions to the faculty members, staff members, and students during the academic year 2020/21 as listed in **Error! R eference source not found.**. 10 of these sessions were conducted in Fall while 3 were conducted in Spring.

Table 8. List of Training

Sem	Date	Title	System	Place	Trainers	N
Fall 20/21	14/10/2020	CAS General Annual Workshop	Moodle	Online	Zubaida & Sanaa	
	09/09/2020	Eduwave and edusession for CPN	Eduwave	34-10	Sanaa & Thuraiya	CPN
	09/10/2020	Edusession (Arabic) for CAS	Eduwave	CIS	Sanaa & Zubiada	70
	09/10/0202	Edusession (English) for CAS	Eduwave	CIS	Sanaa & Zubaida	105
	10/05/2020	FI students four sessions about Eduwave and Placement test in the Moodle	Moodle & Eduwave	CIS	Sanaa & Zubiada & Thuraiya	733
	14/10/2020	Creating online exam and Turnitin for CAS	Moodle	CIS	Thuraiya	9
	28/10/2020	Create a quiz for CAS (Arabic) (Q&A discussion)	Moodle	CIS	Thuraiya	22
	02/11/2020	Create a quiz for CEMIS (Q&A discussion)	Moodle	CIS	Sanaa	30
	07/12/2020	Create Quiz for Aflaj course team	Moodle	CIS	Sanaa	2
	19/01/2021	Create Google from for Long life institute	Google Form	CIS	Thuraiya	1
Spring 20/21	01/03/2021	Online Moodle Traning session (English)	Moodle	CIS	Sanaa	60
	02/03/2021	Online Moodle Traning session (Arabic)	Moodle	CIS	Sanaa	24
	23/03/2021	How to handle the concurrent setting during an online exam	Moodle	CIS	Sanaa	5

9. SATISFACTION SURVEY

CIS conducted its annual survey in July 2021, focusing on the satisfaction level of CIS services. The survey was designed through Google Form to cover most of the CIS services to students, faculty members, and administrative staff.

To ensure validity and accuracy of the collected data some procedures were purposively followed; 1) the survey requires login to university Email to avoid the participation of the untargeted respondents, yet no personally identifiable information has been collected. 2) The survey settings prevent multiple responses and accept only one response by each respondent. Moreover, to maximize the participation rate and obtain the minimum recommended sample size, the survey link was communicated through several channels, namely; Email, browser Pop-up window, and SMS.

Error! Reference source not found. illustrates the survey population, the ideal s ample, the obtained sample, and the percentage of the sample to the collected respondents. The total number of respondents is 842. Students form 38.2% of the respondents, faculty members 35.1%, and Administrative staff 25.7% (see **Error! R eference source not found.** and **Error! Reference source not found.**).

Table 9. Number of survey respondents

Respondents	Population	Respondents	Percentage
Student	**6000**	735	38.2%
Faculty Members	**271**	78	35.1%
Administrators	**440**	29	25.7%

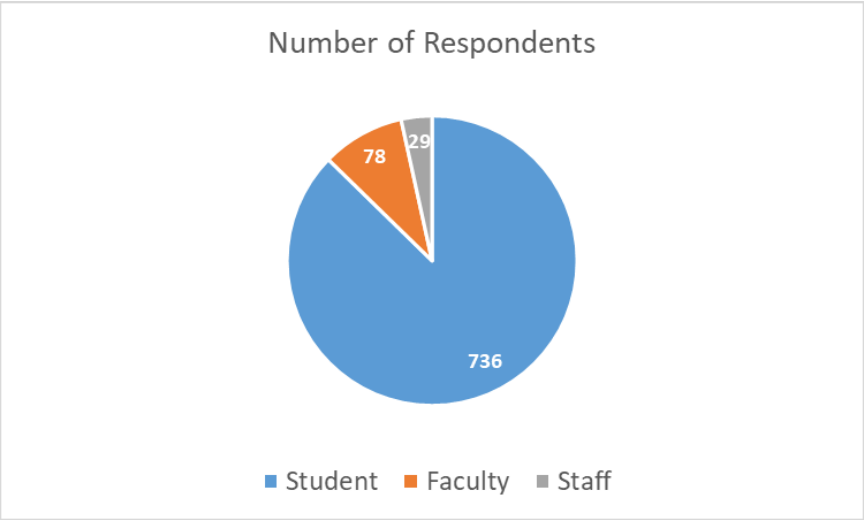


Figure 11. Number of Respondents

SURVEY RESULTS

Student Background

Since the survey was conducted during the implementation of online distance learning, CIS decided to gather some student background information

It was found that most of the students use laptops for their studies (66.3%), followed by mobile phones (26.4%). Some of the students (5.5%) use either a tablet or iPad. Four students (0.5%) do not have any device.

Most students have internet access, either the Home Wifi (73.8%) or the mobile broadband (24.1%). Eight students (1.1%) do not have access to the Internet. Among those who do not have Internet access, 50% give Location as the reason and another 50% said it was due to financial constraints.

The majority of the students (78.9%) are satisfied with the quality of video/audio during their live sessions. A significant percentage are not satisfied (21.1%)

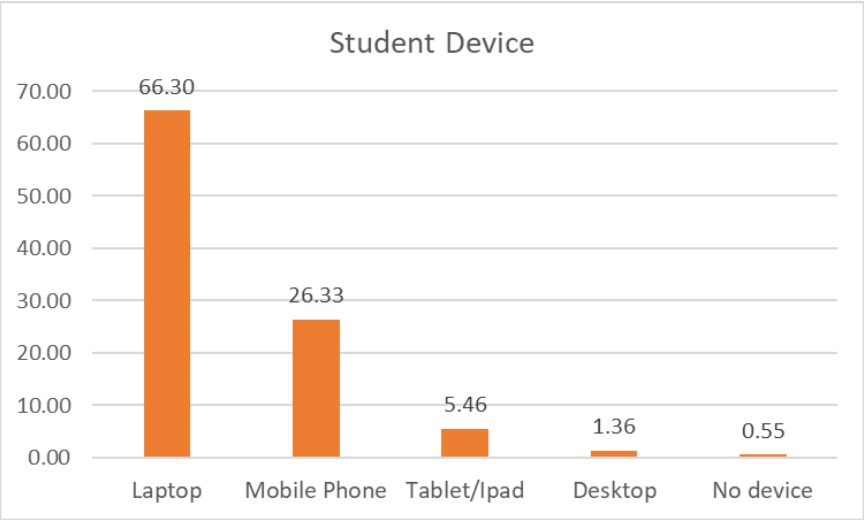


Figure 12. Student Devices

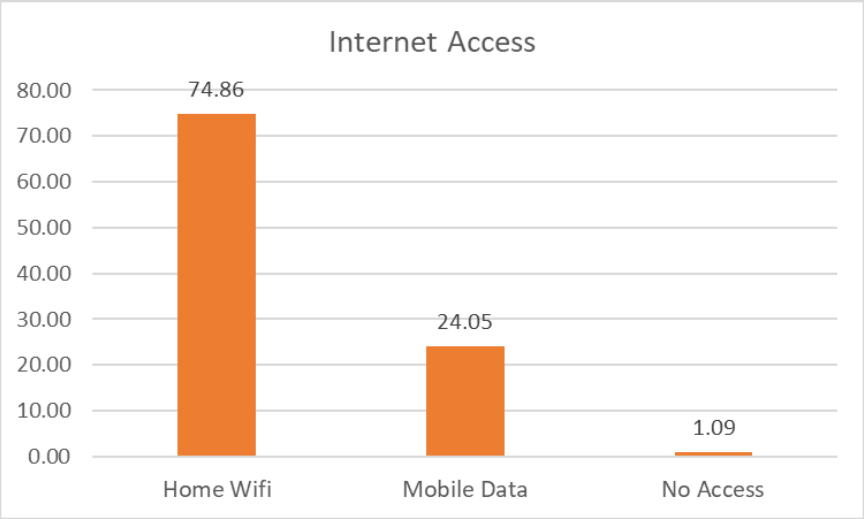


Figure 13. Student Internet Access

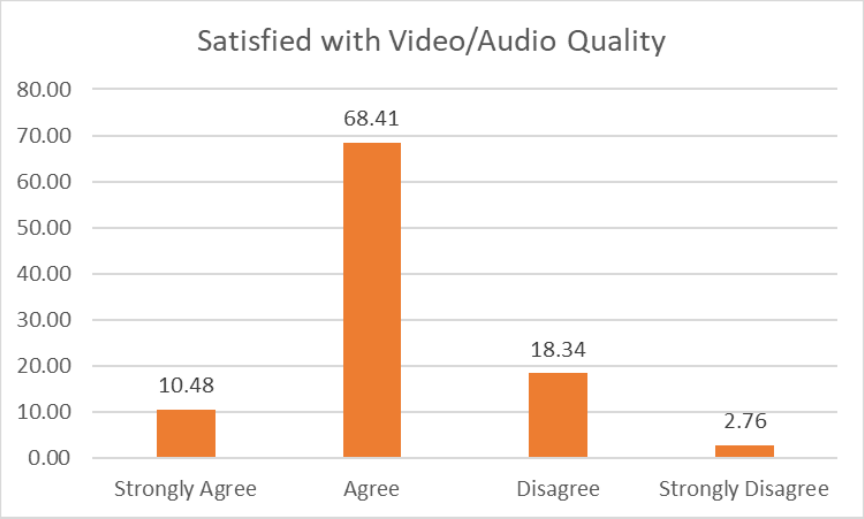
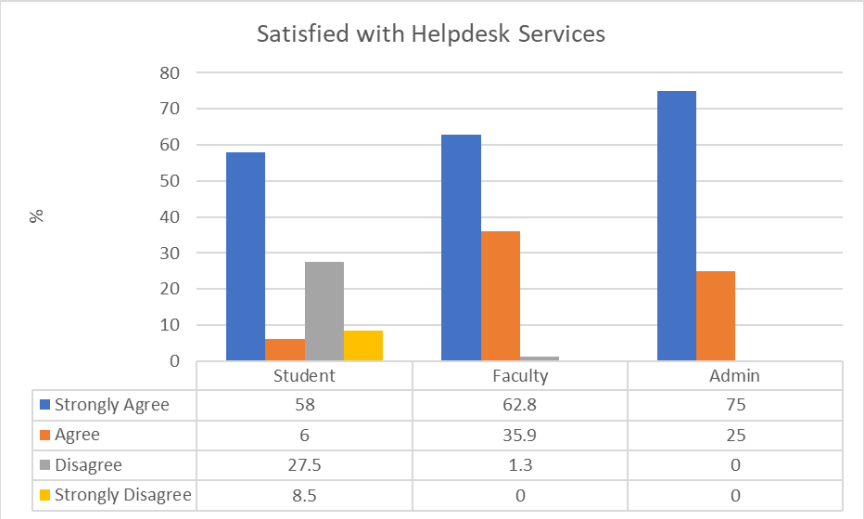


Figure 14. Student Satisfaction with Video/Audio Quality

Satisfaction with Helpdesk

Generally, students (64%), faculty members (98.7%), and admin staff (100%) are satisfied with the Helpdesk services. However, a significantly high number of students (26%) are also not satisfied with the services

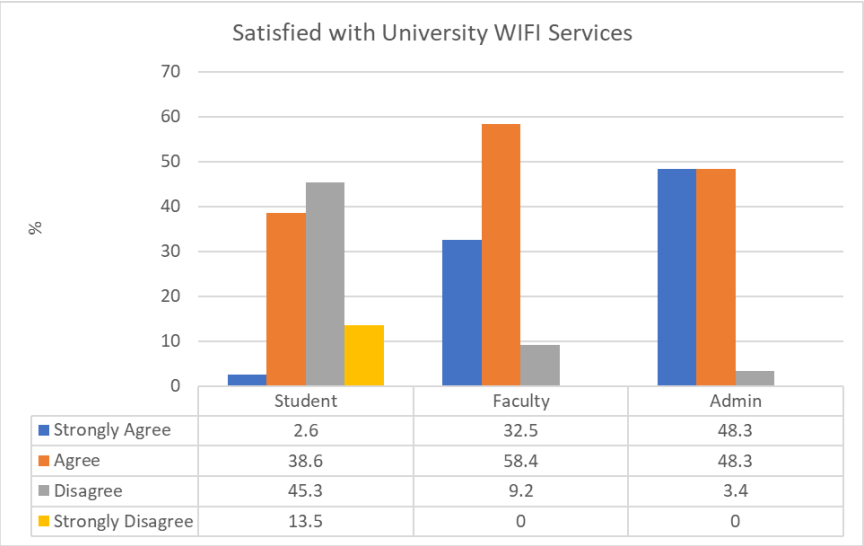


	Student	Faculty	Admin
Strongly Agree	58	62.8	75
Agree	6	35.9	25
Disagree	27.5	1.3	0
Strongly Disagree	8.5	0	0

Figure 15. Satisfaction with Helpdesk Services

Satisfaction with University Wireless Internet

Faculty members (90.%) and administrative staff (96.6%) are satisfied with the University's wireless services. On the other hand, 41%.2 of the students are satisfied with the wireless services. The majority of the students (68.8%) are not satisfied.

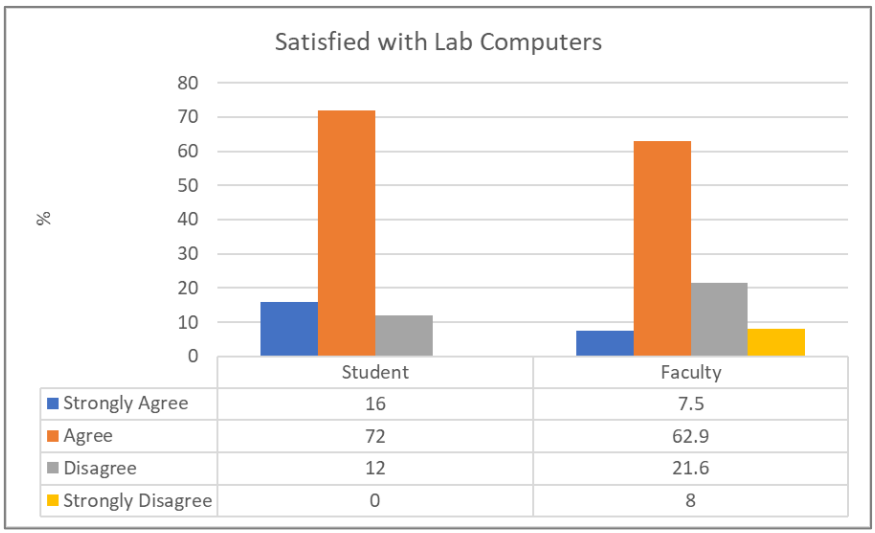


	Student	Faculty	Admin
Strongly Agree	2.6	32.5	48.3
Agree	38.6	58.4	48.3
Disagree	45.3	9.2	3.4
Strongly Disagree	13.5	0	0

Figure 16. Satisfaction with the University Wireless

Satisfaction with Computer Laboratory

Both students (88%) and faculty members (70.4%) are satisfied with the computers in the computer laboratory. It is important to keep in mind that students and faculty members have not fully used the computer labs due to the pandemic.

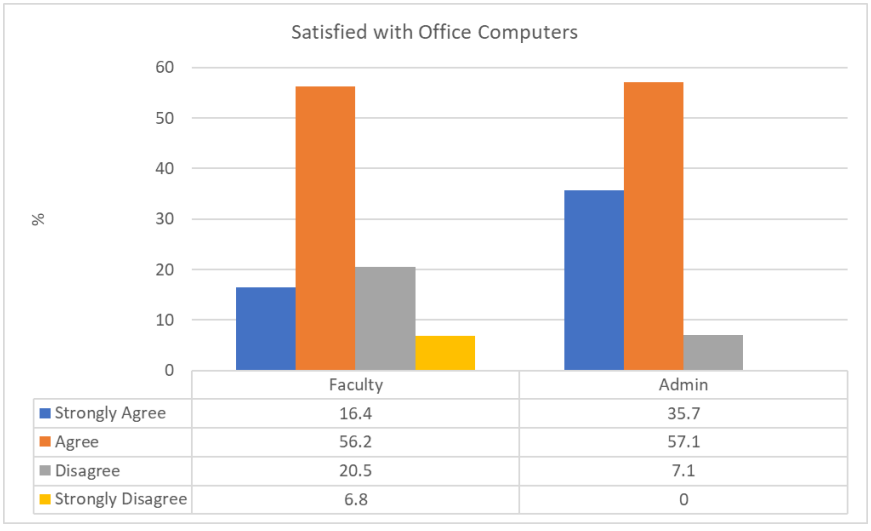


	Student	Faculty
Strongly Agree	16	7.5
Agree	72	62.9
Disagree	12	21.6
Strongly Disagree	0	8

Figure 17. Satisfaction with Computer Laboratory

Satisfaction with Office Computer

Both the faculty members (72.6%) and admin staff (92.8%) are satisfied with their office computers.

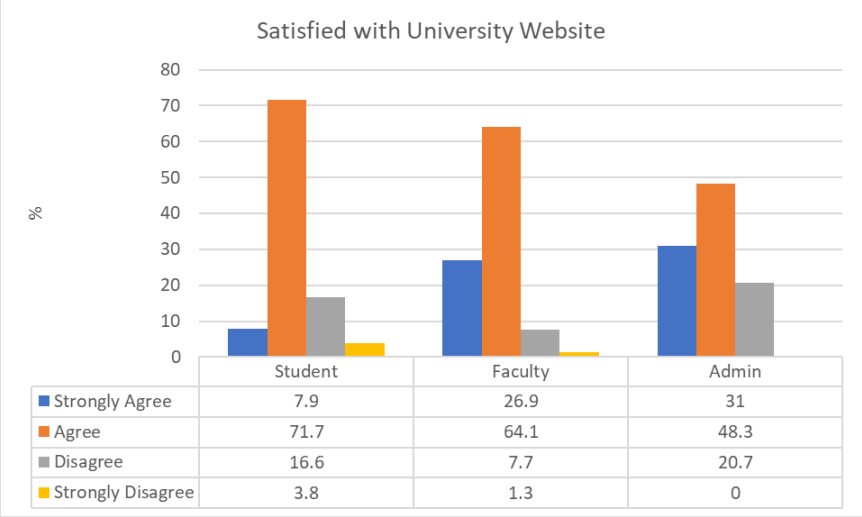


	Faculty	Admin
Strongly Agree	16.4	35.7
Agree	56.2	57.1
Disagree	20.5	7.1
Strongly Disagree	6.8	0

Figure 18. Satisfaction with Office Computer

Satisfaction with the University Website

The majority of the respondents (79.6% of students, 91% faculty members, and 79.3% admin staff) are satisfied with the University website.

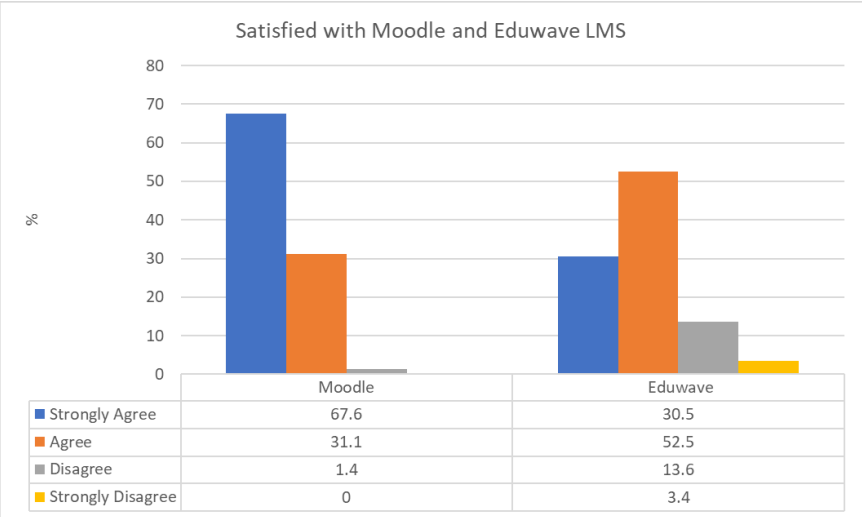


	Student	Faculty	Admin
Strongly Agree	7.9	26.9	31
Agree	71.7	64.1	48.3
Disagree	16.6	7.7	20.7
Strongly Disagree	3.8	1.3	0

Figure 19. Satisfaction with the University Website

Faculty Satisfaction with Moodle and Eduwave LMS

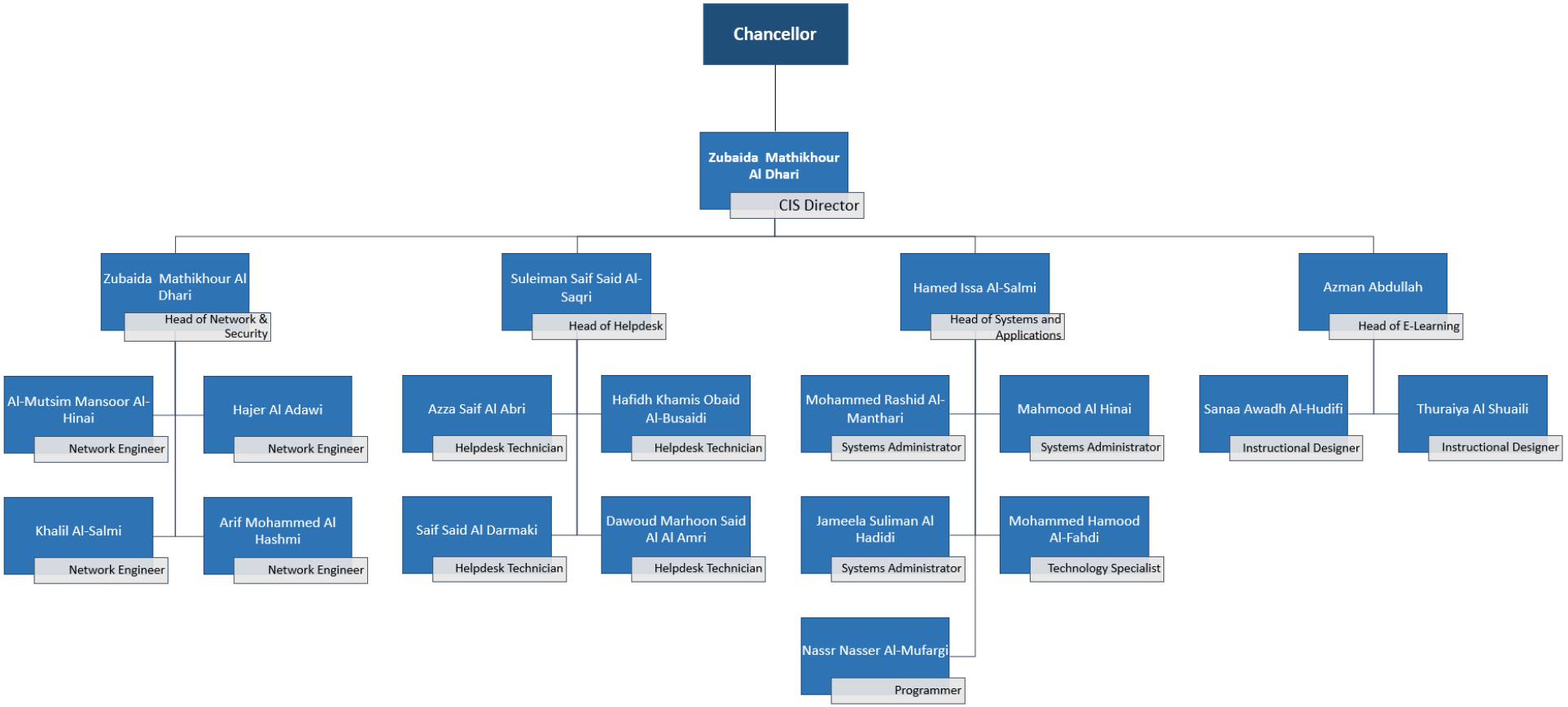
98.7% of the faculty members are satisfied with the Moodle LMS while 83.3$% are satisfied with the Eduwave LMS.



	Moodle	Eduwave
Strongly Agree	67.6	30.5
Agree	31.1	52.5
Disagree	1.4	13.6
Strongly Disagree	0	3.4

Figure 20. Satisfaction with the University LMS

APPENDIX A: CIS ORGANIZATIONAL CHART



APPENDIX B: CORE SYSTEMS

1. Eduwave Student Information and Education System
2. WaveERP.
3. E-Mail System.
4. Library Management System.
5. Disaster Recovery and Backup System 'VEEAM'.
6. Moodle.
7. Turnitin.
8. Google Apps.
9. Print management system 'PAPER CUT'.
10. OMR scanning 'YOMARK'.
11. Supermarket.
12. Restaurant.
13. Monitor 'Zabbix'.
14. Systems management software product 'MS SCCM'.
15. Database system (MS SQL).
16. Windows OSs 'clients + servers'.
17. Web proxy server 'EZproxy'.
18. VDI software to runs a desktop on a user's thin client, or PC, from the servers in a data

center 'VMware Horiz

APPENDIX C: IN-HOUSE BUILT SYSTEMS

1. Developed a mail archiving system for CPN to help to archive the outgoing and incoming letters.
2. Developed a system for UoN Industry and Community Engagement participation of staff and students.
3. Developed a mail archiving system for DPQM to manage DPQM tasks and archive incoming and outgoing letters.
4. NASSR: Graduate vision -- Deanship of Record and Registration -- Survey for graduation ceremony -- Parked --
5. Developed an application to manage the booking of exam timing to control the load of users in the Moodle system.
6. Developed an application for the Deanship of Record and Registration to allow students to request a change major.
7. Developed an application for all Colleges to find and collect online textbooks for the courses.
8. Developed an application for the Deanship of Student Affairs and Society Service to manage the requests for housing and manage the process of housing.
9. Developed an application for the Vice-Chancellor for Graduate Studies, Research, and External Relations to manage the publication of research that is submitted by faculty.
10. Develop an electronic bidding system for UoNIF to manage the bidding of the University of Nizwa palm trees.