CEST 2020 END OF THE YEAR RESEARCH OFFICE REPORT

Associate Dean Research – Associate Professor Jimaima Lako

1.0 INTRODUCTION

The College of Engineering, Science and Technology approximately had a total of 295 staff comprised both teaching and administration staff in 2020. There are eight schools; Building and Civil Engineering; Mechanical Engineering; Electrical and Electronics Engineering; Mathematics and Transport; Pure Sciences; Applied Sciences and Maritime Studies, comprised of a total of 24 departments. The College had four Professors, three Associate Professors, 14 Assistant Professors, 54 Masters and 35 Postgraduate Diploma holders. This means that only 37.3% hold postgraduate qualifications, while 62.7% hold undergraduate qualifications as shown in Table 1 below. It appears that undergraduates staff qualifications continue to improve over the years. There is an increase by 3.5% since 2018 and 2.5% since 2019.

TABLE 1: 2020 CEST STAFF QUALIFICATIONS

School	Cert	Dip	Bachelor	PGC	PGDip	Master	PhD	Prof	Total
Admin	0	1	5	0	0	2	1	1	**9**
Building & Civil Engineering	7	13	12	0	2	9	0	0	**43**
Mechanical Engineering	14	14	11	1	1	5	3	1	**49**
Electrical & Electronics Engineering	2	16	9	0	3	6	4	0	**40**
Mathematics & Computing	0	3	9	0	15	14	3	0	**44**
Transport	11	17	4	0	2	2	0	0	**36**
Pure Sciences	0	2	6	0	5	12	3	2	**28**
Applied Sciences	0	0	7	0	6	4	3	0	**20**
Maritime Studies	13	7	5	0	1	0	0	0	**26**
Total 2020	**47**	**73**	**68**	**1**	**35**	**54**	**17**	**4**	**295**
Total 2019	51	107	63	1	43	45	25	5	340
Total 2018	51	107	62	1	43	44	22	4	334
2020 % PG vs UG	**37.3**				**62.7**				
2019 % PG vs UG	**34.8**				**65.2**				
2018 % PG vs UG	**33.8**				**67.2**				

2.0 STAFF PUBLICATIONS

A total of 32 publications were achieved in 2020, as shown in Table 2 below. Although a bit lower than 2019 (39 publications), it was better than 2018 as shown in Table 3.

Out of 32 publications, Q 1 and Q2 publications were ranked high as 40.6% each. There were limited for Q3 (6%), Q4 (3%) and the unranked journals (9%) and book chapters.

TABLE 2: CEST 2020 TOTAL PUBLICATIONS

	Staff Name	Reference	Journal/Book/Bk Chapters/Pacific	Rank
1	Dr. Abirami Ganesan	Palaniappan Seedevi, Abirami Ramu Ganesan, Meivelu Moovendhan, K. Mohan, Palaniappan Sivasankar, Sivakumar Loganathan, Shanmugam Vairamani & Annaian Shanmugam. Anti-diabetic activity of crude polysaccharide and rhamnoseenriched polysaccharide from G. lithophila on Streptozotocin (STZ)-induced in Wistar rats. Scientific Reports. Nature Research (2020) 10:556 https://doi.org/10.1038/s41598-020-57486-w	Journal	Q1
2	Prof. Tibor Pasinszki	Tibor Pasinszki, Melinda Krebsz. Synthesis and Application of Zero-Valent Iron Nanoparticles in Water Treatment, Environmental Remediation, Catalysis, and Their Biological Effects. Nanomaterials 2020, 10(5), 917; https://doi.org/10.3390/nano10050917	Journal	Q1
3	Ms. Pritika Reddy	Reddy, P., Chaudhary, K., Sharma, B. et al. The two perfect scorers for technology acceptance. Educ Inf Technol (2020). https://doi.org/10.1007/s10639-020-10320-2	Journal	Q1
4	Prof. Olanrewaju Oyewola	O.M. Amoo, M.O. Oyewola, R.O. Fagbenle, Application of the finite-element method to the solution of nonsimilar boundary layer-derived infinite series equations, International Journal of Heat and Mass Transfer, Volume 161, 2020, 120244, ISSN 0017-9310, https://doi.org/10.1016/j.ijheatmasstransfer.2020.120244.	Journal	Q1
5	Ms. Sofia B Shah	S.A. Mania, F.S. Mania, A. Kumarb, S. Shahc, R.E. Traffic related PM2.5 air quality: Policy options for developing Pacific Island countries. Transportation Research Part D. https://doi.org/10.1016/j.trd.2020.102519	Journal	Q1
6	Dr. Abirami Ganesan	Kannan Mohan, Thirunavukkarasu Muralisankar, Venkatachalam Uthayakumar, Ramachandran Chandirasekar, Nagarajan Revathi, Abirami Ramu Ganesan, Kalamani Velmurugan, Palanivel Sathishkumar, Rajarajeswaran Jayakumar, Palaniappan Seedevi, Trends in the extraction, purification, characterisation and biological activities of polysaccharides from tropical and sub-tropical fruits – A comprehensive review, Carbohydrate	Journal	Q1
7	Dr. Abirami Ganesan	Baskaran Krishnan, Abirami Ramu Ganesan, Ravindran Balasubramani, Dinh Duc Nguyen, Soon Woong Chang, Shaoyun Wang, Jianbo Xiao, Balamuralikrishnan Balasubramanian, Chrysoeriol ameliorates hyperglycemia by regulating the carbohydrate metabolic enzymes in streptozotocin-induced diabetic rats, Food Science and Human Wellness, Volume 9, Issue 4, 2020, Pages 346-354, ISSN 2213-4530, https://doi.org/10.1016/j.fshw.2020.05.014.	Journal	Q1
8	Dr. Abirami Ganesan	Ganesan, A.R., Shanmugam, M. Isolation of phycoerythrin from Kappaphycus alvarezii: a potential natural colourant in ice cream. J Appl Phycol 32, 4221–4233 (2020). https://doi.org/10.1007/s10811-020-02214-0	Journal	Q1
	Dr. Abirami Ganesan	Abirami R. Ganesan, Manoj Saravana Guru, Balamuralikrishnan Balasubramanian, Kannan Mohan, Wen Chao Liu, Mariadhas Valan Arasu,	Journal	

9		Naif Abdullah Al-Dhabi, Veeramuthu Duraipandiyan, Savarimuthu Ignacimuthu, M.P. Sudhakar, Palaniappan Seedevi, Biopolymer from edible marine invertebrates: A potential functional food, Journal of King Saud University - Science, Volume 32, Issue 2, 2020, Pages 1772-1777, ISSN 1018-3647, https://doi.org/10.1016/j.jksus.2020.01.015.		Q1
10	Dr. Abirami Ganesan	Abirami R. Ganesan, Manoj Saravana Guru Mohanram, Balamuralikrishnan Balasubramanian, In Ho Kim, Palaniappan Seedevi, Kannan Mohan, Sujatha Kanagasabai, Mariadhas Valan Arasu, Naif Abdullah Al-Dhabi, Savarimuthu Ignacimuthu, Marine invertebrates' proteins: A recent update on functional property, Journal of King Saud University - Science, Volume 32, Issue 2, 2020, Pages 1496-1502, ISSN 1018-3647, https://doi.org/10.1016/j.jksus.2019.12.003.	Journal	Q1
11	Prof. Tibor Pasinszki, Dr. Jimaima Lako, Prof. Todd Dennis	Pasinszki, T.; Lako, J.; Dennis, T.E. Advances in Detecting Ciguatoxins in Fish. Toxins 2020, 12, 494. https://doi.org/10.3390/toxins12080494	Journal	Q1
12	Dr. Abirami Ganesan	Kannan Mohan, Abirami Ramu Ganesan, Thirunavukkarasu Muralisankar, Rajarajeswaran Jayakumar, Palanivel Sathishkumar, Venkatachalam Uthayakumar, Ramachandran Chandirasekar, Nagarajan Revathi, Recent insights into the extraction, characterization, and bioactivities of chitin and chitosan from insects, Trends in Food Science & Technology, Volume 105, 2020, Pages 17-42, ISSN 0924-2244, https://doi.org/10.1016/j.tifs.2020.08.016.	Journal	Q1
13	Prof. Tibor Pasinszki	Melinda Krebsz, Tibor Pasinszki, Tran Thanh Tung, Md Junker Nine, and Dusan Losic: Multiple Applications of Bio-Graphene Foam for Efficient Chromate Ion Removal and Oil-Water Separation. Chemosphere 2021, 263, 127790; doi:10.1016/j.chemosphere.2020.127790.	Journal	Q1
14	Mr. Sailesh Saras Chand	Kumar, B.A., Goundar, M.S. & Chand, S.S. A framework for heuristic evaluation of mobile learning applications. Educ Inf Technol 25, 3189–3204 (2020). https://doi.org/10.1007/s10639-020-10112-8	Journal	Q2
15	Mr. Munil Shiva Goundar	Kumar, B.A., Goundar, M.S. & Chand, S.S. A framework for heuristic evaluation of mobile learning applications. Educ Inf Technol 25, 3189–3204 (2020). https://doi.org/10.1007/s10639-020-10112-9	Journal	Q2
16	Mr. Bimal Aklesh Kumar	Kumar, B.A., Goundar, M.S. & Chand, S.S. A framework for heuristic evaluation of mobile learning applications. Educ Inf Technol 25, 3189–3204 (2020). https://doi.org/10.1007/s10639-020-10112-10	Journal	Q2
17	Dr. Ramwant Gupta	Gupta, R. Manganese Repairs the Oxygen-Evolving Complex (OEC) in Maize (Zea mays L.) Damage During Seawater Vulnerability. J Soil Sci Plant Nutr 20, 1387–1396 (2020). https://doi.org/10.1007/s42729-020-00220-2	Journal	Q2
18	Dr. Satyanand Singh	Satyanand Singh, Pragya Singh, High level speaker specific features modeling in automatic speaker recognition system. International Journal of Electrical and Computer Engineering (IJECE).Vol. 10, No. 2, April 2020, pp. 1859~1867. ISSN: 2088-8708, DOI: 10.11591/ijece.v10i2.pp1859-1867	Journal	Q2
19	Dr. Satyanand Singh	Satyanand Singh, Pragya Singh. Speaker specific feature based clustering and its applications in	Journal	Q2

		language independent forensic speaker recognition. International Journal of Electrical and Computer Engineering (IJECE). Vol. 10, No. 4, August 2020, pp. 3508~3518. ISSN: 2088-8708, DOI: 10.11591/ijece.v10i4.pp3508-3518		
20	Dr. Alvin Lal	Lal, A., Datta, B. Application of the group method of data handling and variable importance analysis for prediction and modelling of saltwater intrusion processes in coastal aquifers. Neural Comput & Applic (2020). https://doi.org/10.1007/s00521-020-05232-8	Journal	Q2
21	Dr. Ramwant Gupta , Dr. Ravi Dutt,	Ramwant Gupta, Ravi Dutt Sharma & Munna Singh (2020) Energy dissipation and photosynthetic electron flow during the transition from juvenile red to mature green leaves in mango (Mangifera indica L.), Plant Biosystems - An International Journal Dealing with all Aspects of Plant Biology, DOI: 10.1080/11263504.2020.1810807	Journal	Q2
22	Ms. Pritika Reddy	Pritika Reddy, Bibhya Sharma, Kaylash Chaudhary. Digital Literacy: A Review of Literature. International Journal of Technoethics (IJT). DOI: 10.4018/IJT.20200701.oa1	Journal	Q2
23	Prof. Olanrewaju Oyewola	Oyewola, O.Ma , Ismail, O. Sb, Abu, K.b, Numerical Simulation of Forced Convection Flows over a Pair of Circular Cylinders in Tandem Arrangement. Jordan Journal of Mechanical and Industrial Engineering. Volume 13, Number 4, December. 2019 ISSN 1995-6665 Pages 221 - 230	Journal	Q2
24	Prof. Olanrewaju Oyewola	Oyewola, Olarenwaju & Petinrin, Moses & Gbolasere, M & Olugasa, Temilola. (2020). Examination of Flow and Heat Transfer Phenomena in Ducts with Dimples and Protrusions. 20. 243-252.	Journal	Q2
25	Prof. Olanrewaju Oyewola	Olanrewaju M. Oyewola. Low Reynolds number effect on steady laminar flow around two cylinders in in-line arrangement. International Journal of Mechanical & Mechatronics Engineering IJMME-IJENS. Vol 20 No. 05	Journal	Q2
26	Prof. Olanrewaju Oyewola	Ajide O.O, Ogochukwu C.D, Akande I.G, Petinrin M.O, Ismail O.S, Oluwole O.O, Oyewola O.M. Production and characterisation of Al-Mg-Cr alloy for machine tool applications. TEST Engineering & Management. July - August 2020. ISSN: 0193-4120 Page No. 01 - 09	Journal	Q2
27	Dr. Mohammed Nizam Khan	M.N. Khan, S. Narayan, A. Rajeshkannan, A.K. Jeevanantham, Formability of Sintered Al, Al-Cu and Al-Cu-TiC Composites during Cold Upsetting, Materials Today: Proceedings, Volume 22, Part 4, 2020, Pages 2499-2508, ISSN 2214-7853, https://doi.org/10.1016/j.matpr.2020.03.378.	Journal	Q3
28	Dr. Abirami Ganesan	Kumar Manimaran, Subban Murugesan, Chinnasamy Ragavendran, Govindasamy Balasubramani, Devarajan Natarajan, Abirami Ganesan, Palaniappan Seedevi. Biosynthesis of TiO2Nanoparticles Using Edible Mushroom (Pleurotusdjamor) Extract: Mosquito Larvicidal, Histopathological, Antibacterialand Anticancer Effect. Journal of Cluster Science. https://doi.org/10.1007/s10876-020-01888-3(0123456789().,-volV)(0123456789().,- volV)	Journal	Q3
29	Ms. Pritika Reddy	Pritika Reddy, Bibhya Sharma, Shaneel Chandra. Student Readiness and Perception of Tablet Learning in Higher Education in the Pacific- A Case Study of Fiji and Tuvalu: Tablet Learning at USP. Journal of Cases on Information Technology (JCIT). DOI: 10.4018/JCIT.2020040104	Journal	Q4
30	Prof. Olanrewaju Oyewola	Tchilabalo E Patchali, Olusegun O Ajide, Olaniran J Matthew, TAO Salau, Olanrewaju M Oyewola. Examination of potential impacts of future climate change on solar radiation in Togo, West Africa. SN Applied Sciences. Volume 2 Issue 12 Pages 1-13. Springer International Publishing	Journal	Un-ranked

31	Ms. Adimaitoga Rabuku	Adimaitoga T., William Rabuku, Abdul Q. Malik. Natural radioactivity measurement of gold mine tailings in Vatukoula, Fiji Islands. Renew. Energy Environ. Sustain. 5, 10 (2020). Volume 5, 2020.	Journal	Un-ranked
32	Dr. Ravita Prasad	Prasad R.D., Raturi A. (2020) Solar Energy for Power Generation in Fiji: History, Barriers and Potentials. In: Singh A. (eds) Translating the Paris Agreement into Action in the Pacific. Advances in Global Change Research, vol 68. Springer, Cham. https://doi.org/10.1007/978-3-030-30211-5_8	Book Chapter	Un-ranked

The rate of publication appears to depend on factors such as the qualification of staff, workload, availability of research facilities and publication fees. Given that only 9% (25) of the staff at the college have PhD qualifications, the 32 publications achieved seem satisfactory.

TABLE 3: PUBLICATIONS 2018-2020

Journal/Book Rank	2018	2019	2020
Q1	9	20	13
Q2	4	9	13
Q3	3	5	2
Q4	1	1	1
Pacific unranked	2	1	
Other Journal unranked	1	2	3
Book Chapter A & B	2	1	
Book Chapter unranked			1
Total	**24**	**39**	**32**

One of the major challenges faced by staff when submitting to high ranked journals is the high cost of publications fees, to as much as FJ$4,000- $5,000. It is therefore recommended that FNU pays for the publication fees for Q1 and Q2 accepted manuscripts. This will allow and further encourage staff to continue and increase the rate of publications in high ranked journals.

3.0 INCENTIVE CLAIMS

The provision of incentive claims continues to encourage staff to publish in high ranked journals. This is reflected in the amount of money claimed by the staff college as shown in Table 4 with sum claim of $63,700.

TABLE 4: CEST APPROVED INCENTIVE CLAIMS

	Name of Author(s)	Quartile	Amount Claimed ($)
1	Bimal Kumar	Q1	$3,500.00
2	Tibor Pasinszki	Q2	$1,500.00
3	Kiran Kumar Kondamareddy	Q1	$1,000.00
4	Shiu Kumar	Q2	$2,700.00
8	Satyanand Singh Pragya Singh	Q2	$2,700.00
9	Mohammed Khan	Q3	$1,400.00
10	Bimal Kumar Munil Goundar Sailesh Chand	Q2	$3,000.00
12	Tibor Pasinszki (90%)	Q1	$ 4,500.00
13	Olanrewaju Oyewola Miracle (70%)	Q2	$ 2,100.00
14	Prof. Tibor Pasinszki Dr. Jimaima Lako Prof. Todd E. Dennis	Q1	$5,000.00
15	Oyewola Olanrewaju Miracle	Q1	$1,500.00
16	Ramwant Gupta Ravi Sharma	Q2	$1,200.00
17	Ramwant Gupta	Q2	$ 3,000.00
18	Alvin Lal	Q2	$2,100.00
19	Alvin Lal	Q3	$ 1,400.00
20	Salvin Prasad	Q1	$ 4,000.00
21	Abirami R Ganesan	Q1	$2,000.00
22	Pritika Reddy	Q4	$500.00
23	Pritika Reddy	Q2	$1,200.00
24	Pritika Reddy	Q1	$2,000.00
25	Satyanand Singh	Q2	$2,700.00
26	Ramwant Gupta	Q1	$5,000.00
27	Shiu Kumar (40%) Ronesh Sharma (40%)	Q2	$2,400.00
29	Abirami Ganesan	Q1	$2,000.00
32	Mr. Bimal Kumar	Q2	$2,400.00
33	Ronil Chand	Q1	$500.00
34	Satyanand Singh	Q3	$ 1,900.00
35	Abirami Ganesan	Q1	$500.00
	Total		**$63,700**

4.0 CONFERENCE PRESENTATIONS

The closure of boarders due to COVID-19 pandemic limit the physical attendance to international attendances by staff, however, it was also an opportunity to embrace technology for online webinars and meetings. Only one online conference was recorded from the college staff participation and presentation, as shown in Table 5 below.

TABLE 5: CEST APPROVED CONFERENCES

Name	Presentation Title	Conference Venue and date	Amount approved
Dr. Ravita D Prasad	Sustainable Energy Policy for Recovery of Island Economics.	Webinar hosted by University of Delaware: November 12th, from 10am to 12noon EST	Free

5.0 QUALIFICATION UPGRADE: POSTGRADUATE STUDIES AND THESIS COMPLETION

The college only offered its first postgraduate programmes in 2017 in the form of Masters by coursework, while the HDRs was offered in 2019.

Table 6 shows the total of 24 postgraduate students of the college, of which 9 are newly enrolled students for 2020 (8 HDR and 1 Master by coursework, while 15 continuing students. Out of the 24, 8 are HDR (3 PhD and 5 Masters) and 16 Masters by Coursework. These students are mainly the staff of the college that are studying on part-time as part of upgrading of their qualification. As indicated above, that only 37.4% of the teaching staff at CEST have postgraduate qualifications, which mean that majority (62.6%), need to upgrade their qualification by enrolling into their respective postgraduate programmes available at the college, especially the Engineering staff on part-time basis for both Master by coursework and Master by research are for 4 years while PhD part time is 6 years.

For the Masters by coursework, majority reached 3rd year studies in 2020, hence none of the students had submitted any thesis, neither completed any Masters programme from any of the four schools; Engineering, Biology, Chemistry and Mathematics. It was observed that most of these Master by coursework students have limited research knowledge and skills, evident in the weak research proposal submitted to CRC for funding approval as shown in Table 7 below. However, comments provided by the CRC has helped raise and improve the standard and quality of research proposal of students, especially the Master by coursework.

Out of the 15 students that enrolled into the Master by coursework since 2018 and 2019, only 47% (7 students) appear to have progressed well with their projects and approved budget as shown in Table 7. However, the other 53% (8 students) have yet to resubmit work to CRC for further approval. One was asked to withdraw from the programme due to not meeting MER and that she was struggling in putting together her research proposal with limited research skills. The others did not submit any progress report and neither participated in the progress seminar. To improve research skills of Master by coursework students who were facing

problems, they were advised to enrol into EST 901 in order to progress the submission of quality research proposals.

TABLE 6: 2020 STUDENTS ENROLLED MASTER AND PHD COLLEGE PROGRAMMES AT FNU

2020 COLLEGE ENROLLED MASTERS AND PhDS PROGRAMME	INVOICED		
	CONTINUING STUDENT	2020 NEW STUDENT	TOTAL
By COURSEWORK			
Master of Engineering in Maintenance Engineering	7		**7**
Master of Science in Biology	2	1	**3**
Master of Science in Chemistry	1		**1**
Master of Science in Mathematics	5		**5**
Total Master by Coursework	**15**	1	**16**
HIGHER DEGREE RESEARCH			
Master		5	**5**
PhD		3	**3**
Total HDR	**0**	8	**8**
Grand Total	**15**	9	**24**

TABLE 7: MASTERS BY COURSEWORK STUDENTS RESEARCH PROGRESS

	Name	Programme/ School	Research Title	Supervisor	Approved/not approved
1	Mr. Danian Singh	Masters of Science (Biology)/School of Applied Sciences	The Potential Geographical Distributions and Ecological Niches of Key Exotic and Endemic Bird Species on Viti Levu Fiji Islands.	Principal Supervisor: Prof. Todd Dennis	Satisfactory Progress – Approved. Planned for submission Semester 1, 2021.
2	Mr. Parmesh Naicker	Masters of Science (Mathematics)/School of Mathematical & Computing Science	EdSigncrypt: Signcrption Scheme Based on Edwards Elliptic Curves	Principal Supervisor: Dr. Maheswara Valluri	Satisfactory Progress – Approved. Proposing to submit by January 2021.
3	Mr. Pravin Chand	Masters of Engineering/School of Transport	Implementation of Reliability Centered Maintenance of New Kinoya Power Plant to	Principal Supervisor: Dr. Patrick Mark Singh	Satisfactory Progress – Approved. 70% Field work completed. Thesis to be

			improve Plant Operation.		submitted by end of 2021.
4	Mr. Ronal Chand	Masters of Science (Mathematics)/School of Mathematical & Computing Science	Mathematical Aspects of Elliptic Curve Cryptography.	Principal Supervisor: Dr. Maheswara Valluri	Satisfactory Progress – Approved. Thesis submitted for vetting by Examiners.
5	Mr. Kaminieli Moqe	Masters of Engineering/School of Mechanical Engineering	A study on the overheating of Heavy Duty Diesel Generators under Fiji's environmental conditions.	Principal Supervisor: Dr. Patrick Mark Singh	Satisfactory Progress – Approved. Proposed to complete field work by Semester 1, 2021.
6	Ratu Jiuliasi Veiwilitamata	Masters of Engineering/School of Electrical & Electronics Engineering	Loopholes and Weaknesses in Signalling System No. 7 (SS7) Networks for Telecommunication System Materials and Methods.	Principal Supervisor: Dr. Satyanand Singh	Satisfactory – Approved pending TFL approval for data access.
7	Ms. Vasenai Kereni	Masters of Engineering/School of Mechanical Engineering	Implementation of RCM on Pumping system to mitigate water distribution losses.	Principal Supervisor: Dr. Patrick Mark Singh	Satisfactory Progress – Approved. Investigations with WAF need to be done.

Based on enrolment data, 8 HDR students registered and enrolled in 2020 as shown in Table 8, however, only 6 students (3 PhD and 3 Masters) enrolled into the HDR preparatory course EST901- Research Skills and Proposal Writing in Semester 2, while one of the Master by coursework students had successfully been transferred to HDR which did not require to undertake the preparatory courses. Out of the 6 students that enrolled, only 3 (2 Master and 1 PhD) passed EST901 and were allowed to enrol into EST902 – Analytical Methodologies in Semester 1, 2021. Those that failed, were asked to improve research proposals and resubmit for marking. It may be important to note that one of the PhD HDR students never attended any EST901 class, even though he was enrolled in the course.

One of the reasons in the low enrolments into postgraduate studies, is limited capacity in supervision and limited research facilities. Improving research facilities and resources may improve enrolment numbers of students into the college research programmes.

TABLE 8: HIGHER DEGREE RESEARCH (HDR) STUDENTS

	Name	Programme/ School	Research Title	Supervisor	Pass/Fail Preparatory Courses
1	Artika Sharma	Master by Research – Environmental Science	Comparative study on the river basin management in the Ba river basin and Nadi river basin in Fiji	Dr Ulukalesi Tamata and Dr Shashtri	Yet to undertake EST901 and EST902
2	Samuela Loaloa	Master by Research – Civil Engineering	Engineering Behaviour of Cement Concrete with Fibres in Fiji and the Pacific Region	Joeli Varo & Prof Oyewola (new supervisors)	Successfully transferred from Master by Coursework with 75% completed
3	Ravikant Singh	Master by Research – Civil Engineering	Stabilization Of Subgrade Soil Using Fly Ash And Waste Plastic Fibers	Dr Patrick Singh	Yet to submit improved research proposal to get through EST901.
4	Nirbhay Chand	Master by Research – Environmental Science	Social and environment impacts of dredging operation: Case study of Nadawa Bay Fiji	Dr Deeksha Krishna and Dr Ulukalesi Tamata	Passed EST 901 and progressed into EST902.
5	Vivek Anand	Master by Research – Mathematics and IT	Efficient Channel Estimation Techniques for MIMO Systems with 1 – Bit ADC	Dr Satyanand Singh and Dr Shiu Kumar	Passed EST 901 and progressed into EST902.
6	Waisea Votadroka	PhD in Science	Impacts of climate change variables (sea surface temperatures (SSTs and storm frequencies) on the behaviour and distribution of Pacific ciguatoxins (P-CTX) in marine fish in the Fiji Islands.	Prof Tibor Pasinszki and AP Jimaima Lako	Yet to submit improved research proposal to get through EST901.
7	Viliame Garau Sakiti	PhD in Engineering	The Development and Diffusion of Enabling Frameworks Towards Green Architecture into Residential Urban Buildings in Fiji	AP Jimaima Lako and Dr Shiu Kumar	Passed EST 901 and progressed into EST902.
8	Emosi Vulisuva Mate Koroitamana	PhD in Engineering	Comparative Studies of Hybrid Renewable Energy System in Fiji	Prof Oyewola	Failed - Never attended any class & neither submitted any assessments

It was also noted that some staff of the college that were upgrading their qualification also enrolled and graduated with Masters and PhDs from other Universities; including the University of the South Pacific (USP) and other Universities abroad. A total of 12 staff graduated with their respective graduate programmes from various universities in 2020; of

which 3 graduated from USP and 1 from FNU on part time basis and the rest from overseas University on fulltime, mostly from Australia and New Zealand as shown in Table 9. Better supervision capacity and better resources available at these other Universities may have provided the competitive edge against FNU.

TABLE 9: STAFF COMPLETED MASTER AND PhD 2020

Employee Name	FNU Position	Division	University	Study Programme
Salanieta Matai	Lecturer	School of Applied Science	Sofia University, Japan	Master Environmental Studies
Naoneet Deo	Executive Officer	CEST General Office	Royal Melbourne Inst. of Tech	Masters Energy Efficient and Sustainable Building with Distinction
Rajnil Lal	Assistant Lecturer	School of Building and Civil Engineering	Auckland University	Masters Civil Engineering
Aron Chand	Instructor	School of Transport	Shenyang Aerospace University	Master of Science Engineering
Akeai Moceiwai	Principal Lecturer	Fiji Maritime Academy	World Maritime University	Masters in Maritime Affairs
Taslim Mohammed	Executive Officer	Sch of Maritime	World Maritime University	Masters in Maritime Affairs
Satish Narayan	Instructor	Sch of Applied Science	Fiji National University	Master Entrepreneurship & Management
Mohammed Khan	Senior Instructor	Sch of Mechnical Engineering	University of the South Pacific	Master of Science Engineering
Vishal Charan	Lecturer	Sch of Electrical and Electronic	University of the South Pacifc	Master of Science Engineering
Anjani Prasad	Executive Officer	CES General Office	University of the South Pacifc	Masters in commerce Management & Public Admin
Arishma Ram	Assistant Professor	School of Applied Science	The University of Auckland	Doctor of Philosophy Geology
Alvin Lal	Assistant Professor	School of Pure Science	James Cook Uni, Australia	Doctor of Philosophy

6.0 CRC COLLEGE STAFF SUBMITTED RESEARCH PROPOSAL AND ACTIVE RESEARCH

No research proposal was submitted to CRC in 2020. However, Table 10 shows that only 5 active researches existed at the college. This means that there has been a limited research conducted as well as a significant reduction in submission of research proposal to CRC observed. In 2018, 13 proposals were submitted to URC with only 9 approved, while in 2019 it was reduced to only 4 with 3 approved and zero in 2020. This may demonstrate the low research interests or poor research culture within the college which may be due to high teaching workloads and poor research resources available. There is a great need in

encouraging staff to develop research proposals, especially with Professors and Associate Professors to mentor staff in to research proposal writing.

TABLE 10: EXISITING RESEARCH AND PROJECTS 2020

Staff Name	Designation	School/Dept	Research Partner (Name & Contact Details)	Research Title	External Institutions
Dr Jimaima Lako	Associate Dean Research	Applied Sciences - Food Science Dept	Nanise Tuqiri: nanise.tuqiri@govnet.gov.fj Devina Nand: devina.nand@govnet.gov.fj Aalisha Sahukhan: aalisha.sahukhan@health.gov.fj Viniana Rasekaseka: viniana.rasekaseka@health.gov.fj Dr Naomasa Oshiro: n-oshiro@nihs.go.jp	Investigation of the Incidence of Fish Poisoning in Communities in Fiji	**1.** Ministry of Fisheries **2.** Ministry of Health **3.** Division of Biomedical Food Research,National Institute of Health Sciences, Japan
Dr Patrick Mark Singh & Mr. Rajnil Lal	1. Assistant Professor 2. HOD-Civil Engineering	1. Mechanical Engineering 2. Building & Civil Engineering	Mr.Andrew Pene: 9906417	Tentative title (Investigation of mechanical properties for Bamboo species in Fiji)	Ministry of Forestry & Ministry of Infrastructure
Dr Ulukalesi Tamata & Ms Litiana Saraqia	HOS-SAS Assistant Lecturer	School of Applied Sciences	Water Authority Fiji Naselai Village	Effect of Nausori Airport sewerage treatment plant on water quality of lower Rewa River (Naselai Village)	NA
Prof Todd Dennis	Associate Dean L&T/Biology Dept.	Pure Sciences - Biology Dept	NA	"Developing a powerful new tool for conservation of Fiji's globally threatened wildlife"	NA
Ms Pritika Reddy	Assistant Lecturer	Dept. Computer Science & Information Systems	Vishal Sharma CEST E0969 vishal.sharma@fnu.ac.fj Ronil Chand CEST E3686 ronil.chand@fnu.ac.fj Shamina Hussein CEST E3664 shamina.hussien@fn	Critical Success Factors for Online Learning: Student Perspective at a local university in Fiji	NA

			u.ac.fj Swaran Ravindra NTPC E2895 swaran.ravindra@fnu .ac.fj		

It was also interesting to note that out of the 9 approved research in 2018, 3 were completed and 2 published in journals, while 3 could not be completed and withdrawn and 3 are yet to be completed as shown in Table 11 below. It appears that limited publications have made from the approved research budget. This is because in the past, completed projects were only required to submit research reports and not published manuscripts.

TABLE 11: STATUS OF APPROVED RESEARCH PROJECTS IN 2018 BEFORE

	Code	Staff Name	Sch	Title	Status	Publication
1	2018-URC014	Naveendra Krishna Reddy	School of Mathematics & Computer Science	Electrification viability study of FNU Ba campus using photovoltaic technology	Completion Form approved with Project Report submitted.	No publication made
2	2018-URC016	Pravin R Chand	School of Transport	Modification of rickshaw to suit local geographical conditions	Incomplete & Withdrawal	NA
3	2018-URC017	Litiana Saraqia, Neetika Sahai	School of Applied Science	Effect of Nausori airport sewerage treatment plant on water quality of lower Rewa river (Naselai village)	In progress (Neetika has left FNU and replaced by Dr Tamata)	Yet to be determined
4	2018-URC018	Yuyun Quomariyah	School of Building & Civil Engineering	The characterization of suva market seasonal vendors in relation to spatial conditions	Completed with only report submitted	No journal publication made
5	2018-URC020	Dr Raul B Alamban	School of mechanical Engineering	Development of re-engineered rice harvester into a multipurpose light transport and farm operations vehicle/support equipment	Incomplete & Withdrawl (returned home)	NA
6	2018-URC029	Ms. Visheshni Chandra	School of Pure Sciences	A Study on Butterfly Diversity Survey in Natewa Peninsula, Vanua Levu	Completed	Publication in journal
7	2018-URC027	Dr. Tibor Pasinszki	School of Pure Sciences	Carbon based materials for water purification, catalytic and sensor applications	Completed	Publication in journal

8	2018-URC021	Dr. Jimaima Lako	School of Applied Sciences	Investigation of the incidence of fish poisoning in communities in Fiji	In progress	Yet to be determined
9	2018-URC024	Dr. Todd E Dennis	School of Pure Sciences	Developing a powerful new tool for conservation of Fiji's	In progress	Yet to be determined
10	Before 2018 – URPC098	Mr. Cyril Rachman	Sch of Building & Civil Engineering	Investigating the Littoral Transport of Sediment along the Nasese Coastline, Suva, Fiji Islands.	Completed-only report submitted	No journal publication made

7.0 ONLINE COLLEGE SEMINAR SERIES 2020

The college has been consistent in its online seminar series throughout the year as shown in Table 12. It has attracted many renowned researchers internationally, presenting and sharing their various research projects. In 2020, a total of 9 seminar series were conducted with 4 external presenters. The main purpose of continuous seminar series was to encourage staff to share research and allow staff members learn from other researchers, update knowledge and to form network and collaborations for future research.

TABLE 12: 2020 ONLINE SEMINAR SERIES

No:	Date	Venue	School	Presenter	Position	Topic
1	13-Feb	MB Hall - Derrick Campus	SBCE	Prof. Sanjay Shukla	Adjunct Professor for Building & Civil Engineering, Fiji National University	Research Practice, Presentation, Publication and Application
2	27-May	CEST Main Boardroom	SME	Prof. Gbadebo Moses Owolabi (external presenter)	Department of Mechanical Engineering, Howard University, Washington, USA.	Probabilistic Framework for Microsturcture-Sensitive Fatigue Design
3	10-Jun	CEST Mini Boardroom	SPS	Prof. Todd Dennis	Professor, HOD Biology, Natabua Campus, Fiji National University	Modelling habitat suitability and potential geographic distribution of the pink-billed parrotfinch
4	14-Aug	CEST Main Boardroom	SAS	Mrs. Salanieta Matai	Lecturer II, Dept Environmental Science, Natabua Campus.	Exploring Sustainable Mangrove Management Policy for Community Wellbeing: Case Study of Nadroga & Nadi in Fiji.
5	2-Sep	CEST Main Boardroom	SBCE	Dr. Naveen B. P	Associate Professor & Head Department of Civil Engineering, Amity School	Waste Problem & the Relation to Waste Mechanics

				(external presenter)	of Engineering & Technology, Amity University Haryana. Panchgaon, Manesar	
6	25-Sep	CEST Main Boardroom	SPS	Prof. Tibor Pasinszki	Professor, Acting Dean CEST, Derrick Campus, Fiji National University.	Ranking Journals and Assessing Researcher's Productivity
7	1-Oct	CEST Main Boardroom	n/a	Peter Birnbaum	Training Systems Australia	Power Engineering (Education & Research) Teaching Systems
8	11-Nov	CEST Main Boardroom	SMCS	Dr. Maheswara Valluri	Associate Professor, School of Mathematics and Computing Sciences, Derrick Campus.	The Impact of Quantum Computing on Crptography
9	9-Dec	CEST Main Boardroom	SBCE	Joeli Varo	Lecturer, School of Building & Civil Engineering, Derrick Campus	Flood Hazard Zonation from a Geomatics Perspective in Viti Levu, Fiji Islands

8.0 RESEARCH EXCELLENCE AWARDS

Similar to 2018 and 2019, two of CEST staff were awarded with Research Excellence and Vice Chancellor's Award for Research Excellence for an Early Career Researcher (ECR). Dr Ravita Prasad was awarded the Research Excellence, while Dr Alvin Lal scooped the Vice Chancellor's Award for Research Excellence for an Early Career Researcher.

9.0 CEST ITUKUTUKU

The first college e-newsletter called CEST Itukutuku was launched and published in October 2020. The main purpose of the e-newsletter was to capture information of the college activities, progress, developments and achievement and share them to the wider community and stakeholders on a quarterly basis. Apart from the CEST research website, this e-newsletter will help market the college externally and even help the college identify gaps that may exist between the college and stakeholders and to find a common ground of working together in the areas of research, teaching and learning, community services and consultancies to attract potential external funding.

10.0 MEMORANDUM OF UNDERSTANDING (MOU) AND MEMORANDUM OF AGREEMENT (MOA)

Table 13 shows 18 current active MoUs and MoAs that exist within the college. It appears that even though these MoUs and MoAs are active, there seemed to limited projects currently taking place, which may demonstrate the under-utilization of the power of agreements and understandings. Encouraging the maximum utilization of these agreements and understanding should increase external funding and research projects.

TABLE 13: ACTIVE MOUS AND MOAS

Type	Name	Validity Period	Main Objectives	Colleges	School/ Contact person	Updates (what objectives has been achieved so far)
MOU	Housing Authority of Fiji	(01/02/2018 to 01/02/2023)	Provide industrial practical attachment to mutually agreed number of FNU graduate students.	CEST	SBCE Mr. Rohitesh Prasad	-Housing Authority has provided industrial practical attachment to SBCE students. Numbers unconfirmed.
MOA	Insight Global Education	(22/09/2020 to 22/09/2022)	Teach international student enrolled in Semester in Development: Fiji Program. The courses are: ENS701 and ENS706 or similar 700 level courses focused on environment issues.	CEST	SAS Dr. Tamata	-Due to COVID 19 travel restrictions, the international students will not travel to Fiji until the borders reopen. The first cohort this year returned home in February once travel restrictions were imposed because of the COVID 19 pandemic. The revised MOU (with fee increases) has just been renewed (29/09/2020).
MOU	Douglas Pharmaceutical Fiji limited	(13/01/2017 to 12/01/2022)	Promote cooperation in the training of Pharmaceutical Manufacturing engineering programme in Fiji.	CEST	SME Mr. Joji Marau SPS Mr. Waisea	-MOU with Douglas Pharmaceuticals is going on with apprentices attending the program. The number of students are not that much compared to when it started. SME -The Department of Chemistry under SPS has also established arrangements for work attachments with Douglas Pharmaceuticals and quite a number of our HE DILT students are working on full time basis.
MOU	Department Of Health and Social Affairs	(04/02/2013 to ongoing)	FNU CEST to provide foundation science programme to FSM DHSA students as FNU receives related fees. FNU CEST also to provide training opportunities for students from DHSA, tutorial support, mentoring etc...	CEST	SPS EO Sciences	-The Foundation Science Program at FNU had provided a large number of candidates for the FSM DHSA programs over the years. A large number of students finishing the Foundation Science program also enter other FSM programs including MBBS. -NB: also note that there change of staffing and new staffs, therefore there is no specific records of progress.
MOU	Centre of Water and Energy Engineering, Torishima Australia Pty Ltd	(05/08/2014 to indefinite)	Joint research and development program, improve WAF's water and waste reticulation operation. Utilize Torishima expertise (Japan, Australia) to subsidize the R&D assessment led by CWEE for WAF's water and waste infrastructure	CEST (CWEE)	CWEE Prof. John Mo	-Carried out energy audit for Water Authority Fiji on Waimanu and Waila pump stations. -Managed foot bridge building project for Waivaka Village with funding support of FJD324,523 from FRA and AUD30,000 from Australian High Commission -Received donation of 4 industry grade pumps from Xylem Solutions, New

						Zealand. Pumps are in Samabula new CWEE laboratory. -Carried out energy from waste analysis for Kinoya Waste Water Treatment Plant. -Initiated geothermal energy investigation project with Ministry of Minerals and Land Resources. Three FNU CEST staff are participating. Meetings on hold due to COVID-19. -Run a 2-day training course for Water Authority Fiji engineers on water pump characteristics and energy estimation.
MOU	Pernix (Fiji) Ltd	(26/01/ 2018 to 25/01/2 023)	Collaborate in the areas of consultancy, research and publication. Enables FNU staff to obtain real field data and analyze data for research purposes. The FNU staff to undertake research work for the Pilot Project.	CEST	CEST Research Dr Lako	-This MOU is ongoing process involving data collection from 2015-19 and analysis of data with regular collaboration and meeting with Pernix Fiji Limited. The information on issues, problems and providing possible solution. By mid-2022,expected timeline for competition.
MOU	Massey University	(25/01/ 2017 to 25/01/2 022)	Collaborative teaching, staff and research exchanges, professional development, joint submission for third party funding, and scholarship	CEST	CEST Research Dr Lako	-A proposal has been submitted for bilateral projects in the priority areas to value adding (This is on hold) -This is ongoing process through NZ embassy for integrated agriculture.

MOU	Royal Melbourne Institute of Technology (RMIT, AUS)	(24/08/2012 to indefinite)	Exchange of staff; research collaboration; articulation programs; development of educational programs in the field of engineering and science.	CEST	RMIT Prof. John Mo	-RMIT team developed and trained FNU engineering team to prepare for ENZ accreditation -FNU TVET group visited RMIT on development of Diploma programs compliance with Dublin Accord. -FNU administration group visited RMIT and met with senior RMIT administration group on development of IT support system for FNU. -Columbo program funded joint final year project with 1 RMIT BE(Hons) Mechanical student and 2 FNU BE(Hons) Mechanical students on Kinoya Waste Water Treatment Plant. -FNU hosted research study of 1 RMIT ME student on geothermal energy generation from hot springs in Rabulu. -RMIT research visit to Labasa and Savusavu hot spring sites -FNU hosted Columbo program project of 1 RMIT BE(Hons) Chemical student on energy from waste study of chicken and piggery farms. -Proposed offshore enrolment of FNU staff to RMIT PhD program. Discussion on hold.
Agreement of Cooperation	Southern Sydney Institute of TAFE (SSI)	(16/12/1998 to indefinite)	TAFE (SSI, NSW) & Padstow College in the area of aircraft maintenance and engineering under draft CASAR 147/66.	CEST	Aviation Mr. Sakaraia	-The agreement of Cooperation with TAFE NSW which was severed in 2010.
MOU	Water Authority of Fiji	(24/03/2017 to 24/03/2022)	Industrial practical attachment for CEST students in the areas of 1) Civil Engineering 2) Electrical and Electronics Engineering 3)Mechanical Engineering	CEST	SBCE-Mr. Rohitesh Prasad SEEE Mr. Samuela Rokocakau SME Mr. Joji /	-WAF has provided industrial practical attachment to SBCE students. Numbers – unconfirmed. -SEEE-Student/Staff attachment programme involved in instrumentation and also member of IAC. -SME-Students/Staffs attachment programme for Masters possesses and improve process system.
MOU	Fiji Meteorological Service	(03/06/2013 to indefinite)	Letter of Intent to Facilitate the placement of Meteorology student at the Fiji Met Office	CEST	SAS Dr Tamata	-This initiative has not progressed because the Diploma in Meteorology program has not been submitted to an IAC and other vetting bodies up to Senate. The consultant hired to prepare the program has completed his tasks, then COVID 19 restrictions delayed the convening of an IAC.

MOU	Still Blue Waters	(22/03/2018 to 22/03/2023)	Training programs, exchange of ideas, publication, expertise and knowledge in the areas mutually agreed. Conducting joint research, lectures, symposia etc…	CEST	SAS Ms. Lia Bogitini	-Blue Waters after trip to visit the island. Since then, there have been no visit again due to budget cuts in 2019 and with the COVID-19 this year, many eco-tourism resorts were closed. So far there is no feedback from the sent report.
MOU	Ministry of Agriculture	(16/01/2019 to 16/01/2022)	Student attachment/internship. Training programs. Exchange of technical information and technical assistance	CEST/ CAFF	SME Mr. Taoba	-This MOU Ongoing process of work attachment where student attached and absorbed in the Ministry of Agriculture. -Also Biosecurity Authority under Ministry of Agriculture also offers attachment programmes and student attached and absorbed in the system.
MOU	Drone Services Fiji (Pte) Ltd	(30/08/2018 to 30/08/2023)	Developing and delivering CAAF approved short courses on Drone Training in Fiji and possibly beyond	CEST	Aviation Mr. Sakaraia Caucau	-The MOU with Drone Services Pty Limited but developed and CAAF approved short courses have not been achieved for this date.
MOU	China Railway No. 5 Engineering group	(26/11/2018 to 26/11/2023)	Student attachment programs; Industry research collaboration for final year Bachelor of Engineering program; Support curriculum development; Strengthen Industry Advisory committee membership	CEST	SBCE Mr. Rohitesh Prasad	-CREG #5 has provided industrial practical attachment to SBCE students. Numbers – unconfirmed.
MOU	Think Pacific Foundation (Fiji)	(15/01/19 to 15/01/2022)	Carpentry Training Programmes and Technical Capacity building. Student attachment programmes. Support curriculum development. And strengthening Industry Advisory committee membership	CEST	SBCE Mr. Rohitesh Prasad	-SBCE staff were supposed to assist Think Pacific Foundation with providing assistance in training but this project was postponed indefinitely due to COVID19 pandemic.
MOU	Graduate Women (Fiji) (GWF)	(22/11/2019 to 22/11/2022)	GWF STEM Camp for girls - increase girls participation in Science Technology Engineering & Mathematics (STEM) studies as well as inspire them to aspire to STEM careers by providing a safe, supportive and fun environment to learn about STEM subjects and surrounded by positive female role models who are successful in STEM.	CEST	SBCE Mr. Rohitesh Prasad SEEE Mr. Samuela Rokocakau SME Ms. Vasenai Kereni	-SBCE female staff was involved in STEM Programme. -SEEE – NA. NB: SEEE do have female participation into its programme but not under STEM Programme. -SME -On going process where female staff have in STEM programme. One of them are TOT programmes in rural schools around 8 schools within Namosi, Serua and Nadroga.

MOU	University of Texas (LBJ School of Public Affairs)	(19/02/2020 to 19/02/2025)	Collaborate to provide human capacity building and flexible E-Learning design and development of programmes.	CEST	CEST Research Dr. Lako	-MOU with University of Texas (LBJ School of Public Affairs) was not progressed this year due to Covid 19. At least 6 research students had applied for ethics approval to come to Fiji for research in March, 2020, but due to COVID 19, their sponsor suspended their trip to Fiji and their research was conducted as online research.

11.0 OTHER DEVELOPMENT

11.1 Installation of Science Research Equipment

The seven science research laboratory instrument that were procured and received late 2019 are still awaiting instalment. These were;

- Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES),
- High Pressure Liquid Chromatograph (HPLC),
- Attenuated Total Reflectance Fourier Transformation Infrared Spectrometer (ATR FT-IR),
- CHNS/O Elemental Analyzer,
- Calorimeter bomb,
- Ultraviolet-visible spectrometer (UV-Vis), and
- Millipore water system.

These instruments are planned to be installed in a room identified at the new Engineering Research and Development Centre. Due to COVID 19 last year 2020 travel restrictions, Thermo Fisher Scientific, NZ could not travel to Fiji to conduct the installation of the above instrument. Installation of these instrument will greatly assist staff and students to conduct various analytical research projects, which is expected to increase and improve research proposal submissions, publications and research outputs for the college.

11.2 Plan for College International Conference

The college had planned for an International Conference 2020 entitled "Advances in Engineering, Science and Technology" to be held on the November 23-27th at Sofitel Fiji Resort & Spa, Denarau Island, Fiji.

The conference planned for 6 separate sessions with the following themes;

1. Advances in Electrical and Electronics Engineering
2. Advances in Mechanical Engineering: Innovation for Sustainable and Resilient Systems
3. Advances in Sustainable Construction Practices in Civil Engineering

4. Nanomaterials
5. Preservation of Biodiversity
6. Sustainable Food Systems

Unfortunately, due to the Coronavirus-19 epidemic, the conference has been postponed to November, 2021 or until further notice if the epidemic still persists.

12.0 CONCLUSION

A total of 32 publications achieved by the college with a total of 80% Q1 and Q2 ranked publications (40% each respectively). There were limited Q3 (6%), Q4 (3%) and the unranked journals (9%) and book chapters.

This performance demonstrates staff commitment to publication, despite limited research resources and high teaching workloads. It appears that majority of research seed funded projects through FNU could not be completed and delayed due to high teaching workload coupled with late release of research funds from the finance office and its complex acquittal system. It was also observed that no new research proposal submitted to CRC by qualified staff. However, some staff undertook research through qualification upgrade as Master by coursework programmes and through HDR programmes. Perhaps, the installation of science research instruments is expected to improve research proposal applications and research outputs for the college. It is observed that the engineering schools are well resourced with new facilities and equipment, however have been under-utilized. These have been mostly used for undergraduate teaching with limited research use. There is great opportunity to fully utilize the engineering resources through collaborative research between science and engineering schools within the college.

For three consecutive years; 2018, 2019 and 2020, CEST staffs have been awarded with the Research Excellence and Vice Chancellor's Award for Research Excellence for an Early Career Researcher (ECR). This year 2020, Dr Ravita Prasad received the Research Excellence and Vice Chancellor's Award and the Early Career Researcher (ECR) was awarded to Dr Alvin Lal. Provisions of appropriate research resources with reasonable teaching workload for staff, increase research trainings and workshops and provision of payments for research publication fees may encourage and improve more quality research with high research completion rates and publications. Despite the high numbers of MoUs and MoAs that exist within the college, there has been limited utilization for potential research and external funding. Perhaps, engaging post-doctorate positions through MoUs and MoAs may improve research capacity and supervision capacity for the college.

A 2020 research strategic plan for the college was prepared and aligned to the SDG, National Development Plan and the FNU strategic plan, however very limited outcomes and outputs were achieved.

THE END