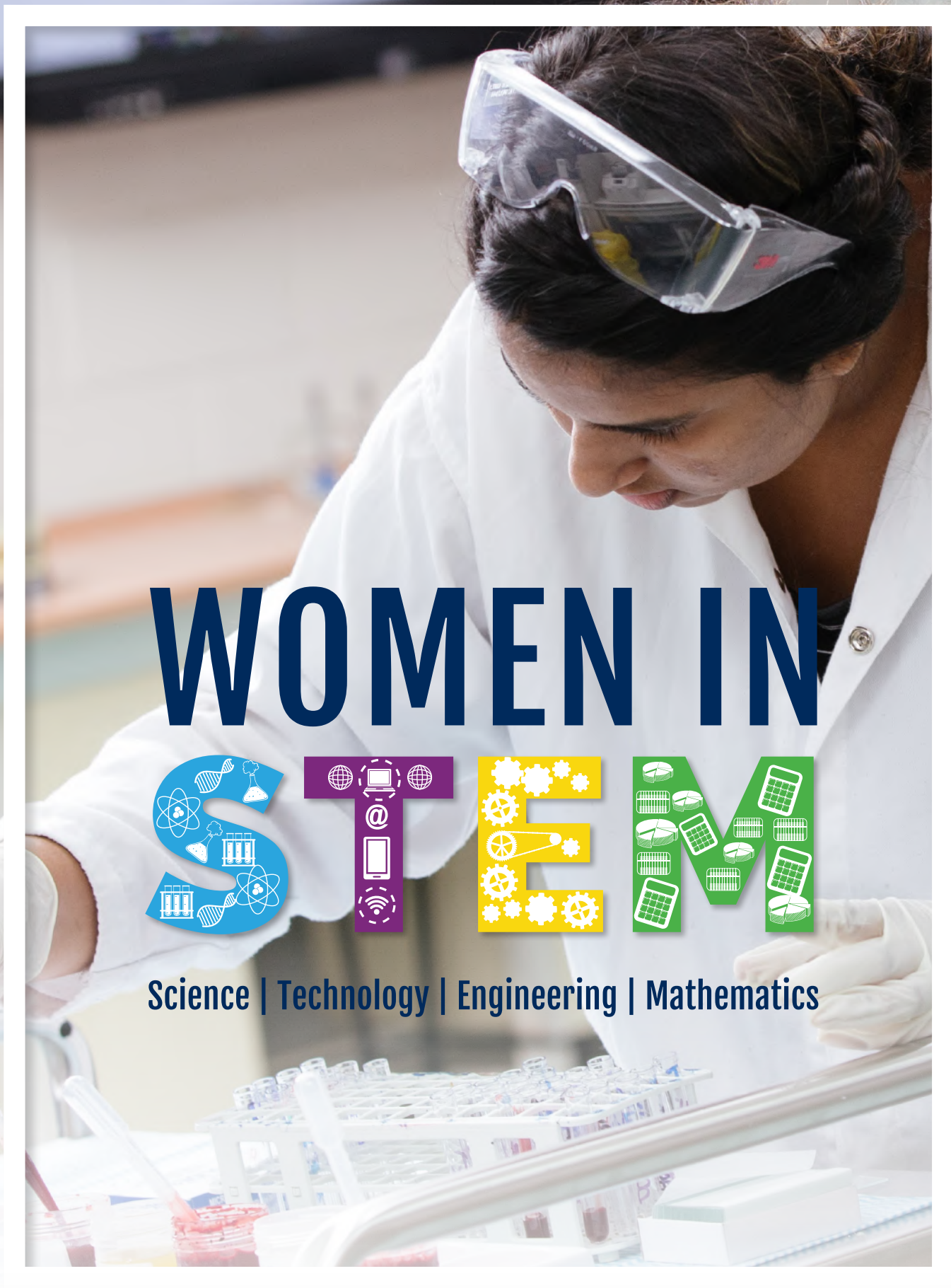




FIJI NATIONAL
UNIVERSITY

FNUNIKUA



ISSUE NO. 09

SEPTEMBER 2019

REVOLUTION FUELS NEED TO PURSUE
STEM SUBJECTS - DR LAKO

VEREBASAGA EYES A CAREER IN AVIATION

Advancing Women in STEM



FNU's Vasenai Kereni (left) was part of the Graduate Women (Fiji) STEM Camp earlier this year as part of joint efforts to inspire more girls into STEM fields.

In the March 2019 issue of FNUNIKUA, in an article entitled “Women in higher education: still work to be done”, I highlighted a strange paradox. Despite the increasing participation of women in higher education – to the extent that the majority of university students in almost every developed country are female – the so-called “gender pay gap” (the gap between average male and female earnings) has not declined. In fact, although it appears counter-intuitive, the gender pay gap in most countries is bigger for graduates than for those who leave school with no qualifications.

There are a number of reasons why the gender pay gap persists, despite greater female access to higher education. These include societal expectations of women as child raisers and homemakers, which mean that women take a disproportionate share of the burden of caring for their families. This often means that mothers put their children first and their career advancement second, in contrast to their more selfish and focused husbands and male partners.

Then there is direct and indirect sex discrimination that privileges men over women. The #MeToo movement and the recent scandals involving high-profile men like Harvey Weinstein and Jeffrey Epstein have highlighted the continuing scale of misogyny in society. However, indirect sex discrimination can be even more pernicious.

Indirect discrimination stems from the way that social institutions are unconsciously structured around the needs of men, not women (how many workplaces have a creche for infants or a breastfeeding room?). Indirect discrimination results from society assigning gender stereotypes to different occupations, characterising nurses and primary school teachers as caring and nurturing (and so women) and investment bankers and financiers as swashbuckling, decisive risk-takers (and so men).

Indirect sex discrimination is the main cause of the gender pay gap for graduate women. By gendering many occupations, society encourages women to study “female subjects” like nursing, education, social and health care and veterinary science. Men, on the other hand, are much more likely to choose “male subjects” like science and engineering, mathematics, computer science and software programming. Because “male occupations” pay, on the average, higher salaries than “female occupations”, indirect sex discrimination perpetuates the gender pay gap.



The advent of “Industry 4.0” and the technological possibilities offered by artificial intelligence, robotics and big data mean that the future belongs to those with expertise in the so-called “STEM” subjects – science, technology, engineering and mathematics. To underpin Fiji’s continued economic development, we cannot afford to allow STEM to remain a “Boys’ Club” and exclude 50% of our nation’s talent pool.

Redefining STEM as gender-neutral subjects which are accessible for everyone will be challenging, because centuries of indirect sex discrimination have deeply embedded societal attitudes to the role of women (including, most damagingly, of young women themselves who cannot envisage studying engineering or mathematics at university).

It has resulted in the overwhelming majority of STEM university students being men, making workshops and laboratories unwelcoming or even intimidating spaces for women to enter. And there are insufficient female champions of STEM working in senior leadership roles in universities to inspire young women.

But within these obstacles to women lie the solutions to the problem. Put bluntly, we need to change the image of STEM,

get more women students into STEM and find female STEM champions to inspire them and lead change.

Universities around the world have been working hard to “reimagine” STEM, by transforming the discourse around the subject. The STEM of the future is not about machine tools, greasy moving parts and engineering precision; it is about creativity and design in a virtual world.

The launch of Apple’s iPhone in 2007 signalled the end of the cellphone with small screens and clunky keypads. But the touch screen had been around for 25 years by this point: it took creativity and imagination to realise that by replacing the keypad with a touchscreen, a cellphone could be transformed into a handheld mini-computer.

Universities are also seeking to increase female student recruitment and retention in STEM subjects in a variety of ways. At Fiji National University (FNU), for example, we are working with Graduate Women (Fiji) on a project to inspire more girls to consider STEM as both a study choice and a future career. By organising various events, attended by inspirational female faculty members from our universities, Graduate Women (Fiji) is encouraging and empowering girls in STEM.

The third step is finding female champions in STEM. A decade ago, the College of Engineering at the University of Canterbury hired its first female Pro-Vice-Chancellor, an internationally renowned electrical engineer, who managed to shake up traditional perceptions of engineering as a male discipline by being both a motorcycle racer and a trained opera singer. (I once rode one of her motorcycles – a 180bhp street version of the Suzuki Hayabusa – and it was a terrifying and humbling experience.)

While there still are relatively few senior engineering women academics, the University of Canterbury has shown the impact that female champions can make, and we will be working with our emerging women leaders at FNU to emulate Canterbury’s example.

It is time to make STEM accessible to all of our talented young people, not just those with XY chromosomes.

*Professor Nigel Healey
Vice Chancellor
Fiji National University*

'STEM studies – This is where your future lies'



Professor Mohini Singh is the Fiji National University’s (FNU), Pro Vice-Chancellor Research. Originally from Fiji, Professor Singh has been an academic with Australian Universities for the last thirty years. She has held several research and academic leadership positions and has served as a member on Journal Editorial, Academic and Advisory Boards. Prior to her current position, she was Professor of Information Systems at RMIT University. She is an Honorary Professor at Victoria University in Australia, and has been a visiting Professor at Brunel University in the UK, an invited Professor at IESEG Graduate School in France, Monash University and at the University of South Australia. She is a Fellow of the Australian Computer Society, and a member of a large number of professional and academic associations.

Below is a Question and Answer (Q&A) session Professor Singh recently had with the *FNUUNIKUA* team regarding her expertise in a STEM field and how we can encourage more females to study and excel in STEM fields.

1. Please provide a brief background on your decision to study in the field of Information Systems.

I was a little confused as to what I should enrol in after completing high school at Dudley High School in Suva, so I decided to complete an honours degree in Economics. Out of interest in computers, I completed my postgraduate studies in Computers and Business Data Processing at the University of Alberta in Canada, and in Business Systems at Monash University in Australia. This required learning programming languages, which I thoroughly enjoyed. This knowledge enables you to understand how computers work, or to make computers do what we want them to do for us. I then completed a PhD researching the implementation and management of new technologies (large computer systems) in large organisations, which was an enjoyable and worthwhile journey. I completed my PhD at Monash University with an outstanding

PhD Award. I published six papers from my PhD research, before submitting my thesis for examination.

2. What are some of your highlights during your academic career?

Having completed a PhD on issues of new technologies my research kept evolving, addressing E-business and E-Government issues, Social media communication issues, FinTechs (financial technology), Blockchains and IoTs (Internet of Things). Being tasked with teaching Artificial Intelligence (AI) and Machine Learning once, I had to learn all about the topic which is now an added bonus as AI is embedded in almost all computing applications. Doing research on topics that are fast evolving meant writing papers and presenting at conferences before the topic became dated. This led to meeting with international researchers who were working on similar topics, collaborating with them on publications, and becoming part of wide networks addressing newer issues on these topics. Publishing my research helped gain recognition as an expert in some of the topics above, due to which I was pleasantly surprised one day to receive an invitation from the Parliament of Victoria in Australia to present my research on E-Business to them. The aim was for the parliamentarians to get in insight on E-Business for policies on infrastructure requirements for rural Australia.

3. What were some challenges that you used as a building block to enhance your knowledge, skills and experience?

I always see challenges as opportunities for achieving something better. Working in the field of new technologies enables us to keep up with new developments, working with and understanding smarter technologies, learning new ways of doing things, and most of all seeing the very notable shift in employment trends that are technology-oriented. Keeping up with technological developments and changing trends in technology applications in all we do requires keeping up with new knowledge, which is a challenge, yet an opportunity.

4. Did you feel like your learning experience was different because you are a female?

My very honest answer is that being a female is no barrier to technological knowledge. All females are just as clever and capable as their male counterparts. I have worked in groups where both female and male members contributed equally, I have taught both male and female students at Universities who were equally good, and I have seen outstanding project outcomes from teams comprising both male and female members. The stereotype notion that computing is not for girls is very yesterday. It became outdated a long time ago. More women than men are now using and working with digital resources, are technology entrepreneurs, and holding senior positions in organisations such as Facebook, Google, Microsoft, Intel, Xerox and Apple.

5. As Pro Vice-Chancellor Research of Fiji National University (FNU), how do you use your skills, knowledge and experience in your field of expertise to help fulfil your current role and responsibilities?

We at the Research Office are moving towards ‘lean and green’ operations in all we do. Technology enabled connectivity is especially useful for international collaborations, use of large databases and analytics is helping us determine research topics that are trending, identifying top researchers in different fields to work with, funding opportunities and universities with similar synergies. We are also able to see who is doing what at our University, which is enabling us to channel resources to where they are

needed most. With some basic infrastructure development that is currently required, we will adopt e-research, similar to international universities.

6. We note your renowned work in the fields of Information Technology and Innovation Management, e-Business and e-Government, e-Services, Digital Entrepreneurship and Social Media. Why would you encourage more females to enter this field, or more generally, STEM-related fields of learning?

These topics are interesting, evolving, have already taken over 60 percent of the job market with the promise of more opportunities in these fields of work and research. All females are clever, are very used to fast changing fashion trends which they easily translate to changing technological trends, and are always ready to replace mundane tasks with more interesting developments and new ways of doing things. Our girls will achieve all of the these through STEM related learning.

7. If we were to target females from a young age, how we can collectively instill interest in STEM subjects in these girls?

I am of the impression that our three to five-year-old girls are now playing with iPads, mobile phones and computer games more than playing with dolls and dolls houses. Research shows that parents, school teachers and career teachers are all using phrases such as ‘technology is the way to go’ ‘you are just as good as your brother is’ ‘I would like to see you do better than the COO at Facebook’ and making the best use of applications that instill a positive attitude towards STEM in children.

8. By studying and working in STEM fields, how can females contribute to the growth and development of their families, communities and the nation as a whole?

The job market is fast shifting towards STEM-related areas. Female graduates from STEM will easily acquire well paid positions in which they will succeed helping their families financially, technologically developing their communities with numerous entrepreneurial opportunities, and making significant contribution to national growth through technological developments which in the long term are economical, do not require a lot of resources and capital, are easy to manage and develop further, promote transparency, entail easily traceable electronic trails for managing and improving customer experience (CX), promote connectivity (IoT), enable smarter ways of doing things (AI) and endorse Industry 4.0.

9. Any other comments.

In Australia, to encourage girls into STEM programs, there is a Government sponsored initiative called ‘Go Girls Go’, which has now progressed to ‘Go Girl, Go for IT’. In Fiji let us say ‘*Toso Girls Toso* to STEM studies. This is where your future lies’.

“ Being a female is no barrier to technological knowledge. All females are just as clever and capable as their male counterparts. ”



FNU students during a science lab class.

Female trio inspired by trip to CEST

Amidst a group of students from Lomaivuna High School crowding around to listen to a brief course presentation during the Fiji National University (FNU), Engineering and Science Fair were three eager females standing front and centre asking questions.

Year 13 students Fiona Ram, Raijeli Waqa and Loalive Dilawe were part of a group of about 20 students from the Naitasiri school who visited the exhibition to learn more about FNU’s College of Engineering, Science and Technology (CEST) and its programmes available.

“This is our first time coming here and we are impressed that this is a very organised event,” Ram said.

“We have toured the booths and were able to speak with the students and teachers, participate in quizzes and experiments and inspect their models and displays.”

Waqa added that as a pure science student, she was most interested in the CEST schools of Applied Science and Pure Science.

“I know I want to study in the science field but I haven’t really made up my mind about which specific field I would like to learn, so this fair has really helped me try and make up my mind,” she said.

“I have taken the pamphlets they have and will go back home and discuss this with my parents and teachers.”

Technical Science student, Dilawe, said

they were interested in the study of science because it was an interesting field with many different options of learning.

Upon reaching the Agricultural Engineering workshop, the trio were pleased to see that a current female FNU student was explaining the course to the girls and their classmates.

“She was good and the way she explained was clear and caught our interest,” Ram said.

“We kept asking her questions and even after she finished explaining and our group started moving on, we were inspired by her and even asked if we could take a picture with her.”

The FNU student, Siteri Boseiwaqa, said she was honoured to have impacted the students and was happy to answer all their questions.

The Year 1 student said she enrolled in the programme as she wanted to combine her love for agriculture, science and engineering.

“In Agricultural Engineering, we not only learn about farming but how do build the machines we use by applying our engineering skills because we also learn about welding, carpentry, fitting and machining,” the 19-year-old said.

Boseiwaqa said being a female did not hinder her studies and added that this should not be a reason for someone not to pursue their interests.



Technology advancement to drive future jobs – Mavoa

The advancement of technology is the catalyst for increased demand in graduates from the fields of Science, Technology, Engineering or Mathematics (STEM) to cater for employment opportunities in the future.

This is the view of Fiji National University (FNU), College of Engineering, Science and Technology (CEST) Acting Dean, Salabogi Mavoa.

“STEM is very important, not only for Fiji but for any nation,” Mavoa said.

“People with strong foundations in these backgrounds play a very important part in national development and economic stability. STEM teaching goes beyond the transfer of knowledge.”

“We engage the students, equip them with critical thinking, problem-solving and creative and collaborative skills and ultimately establish connections between schools and the workplace.”

Because of this, Mavoa said, the College had a special place in Fiji’s history books as an institution that produced highly-skilled graduates.

“We have trained our country’s engineers, electricians, scientists, architects and surveyors, seafarers, programmers and mechanics and every year we receive more students who wish to study and contribute in their field of interests.”

“STEM is an important component of these jobs and more, because in this technological age, jobs are being modified and changed

accordingly so our students need to be able to adapt to this.”

One important issue that arises when highlighting the importance of STEM is the need for more females to be interested and study in these fields, Mavoa said.

“This has a lot to do with mindsets. Historically, we know that parents and children themselves would view careers in STEM fields as predominantly male-dominated and sometimes teachers and other peers also share in that same mindset.”

“What we need is to change these mindsets and highlight that females can also be successful in these fields. We do go out into schools and talk about our programmes and highlight career pathways available to both males and females, it is still up to the individual to decide if this is certainly their field of interest.”

On a positive note, Mavoa said it was encouraging that mindsets have shifted as this was evident in females entering STEM fields at the College.

“Over the years we have had females enrol at CEST in fields such as engineering, sciences and electrical and mechanical studies and so this has been encouraging to see.”

“At present, 20 percent of our students are female and compared to previous years, we can definitely say that this number is increasing.”

“Instead of seeing this as a somewhat low percentage we can instead use it as a motivating factor in encouraging more females to enter the STEM world.”



Highlights

The two-day Engineering and Science Fair held at Derrick Campus was a successful event that provided high school students the opportunity to speak with FNU staff and students, explore student projects and participate in fun experiments whilst learning about the programmes on offer. Below are highlights from the event.

School of Applied Sciences

Displays related to environmental and food science, specialised OHS equipment, and sustainable home model. Models included custard powder processing line, DNA models and brix analysis.

School of Building & Civil Engineering

House structures made using recycled materials were on display. The project focused on green infrastructure. There were also minerals and rock samples on display. There was a ‘Magic Tap’ which received a lot of attraction. Water was dispensed from the tap without inlet connections.

School of Electrical & Electronics Engineering

The Robocon model, a student project attracted a lot of interest.

The machine was manoeuvred and performed tasks using remote controls. Visitors also learnt about light satellite systems and FM broadcasting station – studio and transmission.

School of Mathematical & Computing Science

Visitors were provided advise on study opportunities available in science, technology, engineering and mathematics (STEM) subjects and careers. Various quizzes and activities in mathematics kept visiting students engaged. Winners walked away with College merchandise.

School of Mechanical Engineering

Displays related to renewable energy, agricultural engineering, student capstone projects and models designed by fabrication and welding students captivated the audience. Visitors were provided an overview of small irrigation systems for farms.

School of Pure Sciences

Displays featured from the chemistry, biology and physics departments included volcano models, colour changing beakers, different types of polymers (plastics) and how to

identify them. It also showcased cell biology and the biological aspects of climate science.

School of Transport

Rickshaw and golf carts modified to be environmentally-friendly were the most popular. Visitors were taken through the car body painting, buffing and polishing process. A project of great interest to the visitors was the air-conditioning system, which used ice instead of air-con gas to operate.

Science Circus Pacific

FNU lecturers were also on hand to help duo Joe Duggan and Emily Standen of Science Circus Pacific conduct fun and interactive experiments with the visiting students. The demonstrations highlighted how low-cost materials could be used to translate science knowledge into practical experiments.

Graduate Women Fiji (GWF)

GWF also had a booth located at the MB Hall. They were encouraging young girls to join STEM subjects. Visitors were also given the opportunity to sign up and learn how to become official GWF STEM Camp trainers.





Revolution fuels need to pursue STEM subjects – Dr Lako

to female students wanting to take-up these subjects.” Dr Lako said while the country faces a skill shortage in these fields, it is also crucial that gender is no barrier to ensuring all young people have the knowledge and skills needed to succeed in our growing economy. She said it was imperative to ‘talk about STEM’ to reduce the STEM gap in Fiji.

According to Dr Lako, primary and secondary school teachers teaching STEM subjects also play a key role in making these subjects simpler and interesting to students, especially to encourage girls to take up these courses. She said this could help raise the interests of students in these areas before joining the University.

“The key to encouraging girls to develop an interest in STEM is to catch them early. They need counselling and good academic advice before they go onto choosing a career. This is where our responsibility as a University also comes in – to provide avenues to our younger generation to have a feel and ask questions about STEM courses and the careers available,” said Dr Lako.

“The College organised a two-day event – Engineering & Science Fair this month in collaboration with Australian National University (ANU), where ANU’s Science Circus Pacific team performed hands-on experiments and many other activities with the school students in a bid to increase the student’s interest in STEM subjects.”

To further promote STEM subjects in Fiji, Dr Lako said, CEST in collaboration with the University of Newcastle and the Ministry of Education, Heritage and Arts will host the Science and Engineering Challenge in November this year, where primary and secondary school students will compete in interesting STEM activities.

Dr Lako emphasised that there was also the need to celebrate female leaders in STEM careers.

“There are fewer female leaders in STEM careers and if we are to encourage the younger generation to opt for a career in these subjects than we must first acknowledge the ones who are already in this profession making their marks.”

“We need to recognise their contributions in these heavily male-dominated careers. By identifying such talents, we can use their stories, struggles and successes to encourage our young girls to take up STEM subjects and careers,” Dr Lako added.

<https://www.stemgraduates.co.uk/women-in-stem>



Dr Jimaima Lako.

Technology is seen as the main driver of the 21st century and its applications are seen in almost every aspect of modern life, from using smartphones to make online purchase to transporting medical supplies to remote places using specially designed drones.

The use of cutting edge technology is truly fascinating. As the world enters a new era of digital technology, the so-called “Industrial Revolution 4.0”, where the Internet of Things, Big Data Analytics, Artificial Intelligence (AI), Robotics and Cloud Computing are rapidly transforming economies and working practices.

New corporations and new business models are rapidly emerging, displacing many of today’s occupations and working practices. As fast as Industrial Revolution 4.0 is destroying manual and routine jobs, it is creating new occupations such as Social marketing managers, data scientists, robot coordinators, internet of things solutions architects, blockchain developers – all of which are jobs that did not exist a few years ago.

As a result, there is an increasing number of employment opportunities that require individuals to have knowledge and skills in the Science, Technology, Engineering, Mathematics or STEM fields. While this may be so, it is widely acknowledged that women are still largely underrepresented in STEM jobs.

According to the STEM Graduates UK website, the percentage of women in STEM statistics globally reveal that just 15 per cent of Engineering graduates, 19 per cent of Technology and Mathematics and 38 per cent of Computer Studies are females.

This gender imbalance is often referred to as the STEM gap. Despite the growing emphasis on gender equality, gender disparity in STEM fields remains an issue in the modern labour market.

According to Fiji National University’s (FNU) College of

Engineering, Science and Technology (CEST) Associate Dean Research, Dr Jimaima Lako Fiji is also facing a massive STEM gap issue.

“Science, technology, engineering and mathematics are used in our everyday lives and without them development, innovations and advancements, for example, into the digital era could not have taken place. Therefore, more and more expertise in these subjects and fields are needed,” said Dr Lako.

“It is noted that in Fiji, sectors that require STEM subjects appear to be experiencing skills shortage.”

The food scientist said there is a growing demand for STEM skills in Fiji, particularly for sectors such as engineering, science, construction and manufacturing. She, however, said when choosing a career, there is still a stark gender divide despite living in a world where we are constantly told that girls can do anything that boys can.

“I think gender stereotypes in homes and work spheres in which girls are expected to take only feminine related careers such as nursing, teaching, etc discourage girls from taking up STEM subjects.”

The senior academic said this may appear to be confirmed by fewer females working in these STEM subjects at the university level.

“At CEST only 20 per cent of our students are females. This appears to correlate with the low percentage of the female academic staff teaching STEM subjects.”

“For instance, at CEST only 17 per cent are female academic staff teaching the STEM subjects, which may not be encouraging

Young Radininaceva wants to become a Mechanical Engineer

The chilling early morning temperature failed to take away the high-level of excitement the students of Wainimakutu Secondary School had as they prepared to attend the Engineering & Science Fair organised at the Fiji National University’s (FNU) College of Engineering, Science and Technology (CEST) at Derrick Campus in Samabula.

The students together with their teachers commenced their journey to Suva at 6 am from Namosi.

The group braved an early 4.30 am start and the 2-hour bus ride to the City was “worth it”, according to Year 11 student Merelita Radininaceva.

According to Radininaceva the trip was “important” as she used this opportunity as a fact-finding mission to decide which tertiary institution she would enrol into after completing high school.

“I have heard a lot about FNU where students have practical sessions during their course. I wanted to see for myself what kind of equipment the students train with,” said Radininaceva.

“After touring the campus – at first I felt like I am lost and could not recognise which way I came and which way to go back but luckily

the student volunteers provided excellent guidance to us.”

Radininaceva said she was amazed to see such a wide range of machines and equipment available at the College for practical sessions.

“Every programme under the College has its own space and training equipment – this is why people say at FNU you learn through practical sessions with real apparatus.”

Following her tour, the teenager said she was confident that she would enrol at FNU to study Mechanical Engineering.

When pressed on her choice, Radininaceva said she wanted to be known for breaking barriers and doing things out of her comfort zone.

She is the only female in Year 11 at her school who is currently studying Technical Drawing. This, she said, would be an added advantage for her to take-up this programme.

“Being the only girl with a class full of boys has made me adjust in that environment. In fact, the boys are very supportive and I am confident I will get the same support when I join FNU to pursue Mechanical Engineering.”

“I do not mind getting my hands greasy and working with tools that maybe twice my size. For me it is about leaving a mark and being an inspiration for other girls,” she added.



Merelita Radininaceva (left) with her friends from Wainimakutu Secondary School pose for a picture while touring the booths.



Ligacere tells of Automotive Engineering passion

Statistics from the Land Transport Authority (LTA) indicate that in 2016, there was a total of 15, 196 new and secondhand vehicles registered in the country.

According to LTA reports in the media, this was a growth rate of approximately 10 percent.

Given this increasing trend, in addition to the number of vehicles already on our roads, Government has prioritised the need to provide better roads and infrastructure for the travelling public.

Drivers also place importance on the need to regularly maintain their cars in good condition to ensure longevity and safe driving on our roads.

To do this, drivers rely on the expert advice and knowledge of automotive engineers, whose role includes designing new products and modifying existing ones, troubleshooting and solving engineering problems, research, design, develop and produce vehicles and its components and investigate product failures.

Automotive engineers also test motor vehicles and their parts and carry out diagnostic work to identify problems with the vehicle and carry out repair works, if necessary.

Although a traditionally male-dominated field globally and locally, females are breaking barriers and studying and working in this field with the same passion, skills, commitment and

qualifications as their male counterparts.

One such female at the Fiji National University's (FNU), College of Engineering, Science and Technology (CEST) is Kite Ligacere.

Ligacere is the Head of Department, Automotive Engineering at the College and also a lecturer in this field.

Originally from Nakobo village in Cakaudrove, Vanua Levu with maternal links to Tubou, Lakeba in Lau, Ligacere is a woman with a loud and approachable personality.

"I love this field and I love what I do," she stated confidently as an introduction to her life story.

"As a young girl, growing up I would watch my maternal grandfather doing mechanical work as he was an engineer and sometimes he would hand me screwdrivers and other tools to play with like toys, so this piqued my interest from an early age."

"When I completed secondary school at Bucalevu High School in Taveuni, I enrolled at Fiji Institute of Technology (now known as CEST) in 1989 to study a Trade Certificate in Motor Vehicle."

Driven by her interest in cars and childhood experiences, Ligacere said she was not deterred when she entered the classroom on her first day of studies in a room full of males.

"I quickly became 'one of the boys' and we worked together on projects and assignments."

"They were helpful whenever I needed assistance or advice."

"I also gave them assistance and advice so we really had an equal learning field at all times."

She was quick to point out that although she was what some would call a "tomboy", this was a myth about being in male-dominated fields that she wanted to dispel.

"It certainly does not mean that only tomboys can be in this field; any female can," she pointed out.

Ligacere completed her apprenticeship at Carpenters Motors and was later employed as an auto electrician and air-con technician for five years.

In 1998, Ligacere jumped at the opportunity to teach at FNU and pass on her knowledge and experiences to the next generation of students.

"I saw this an opportunity to sort of try and draw more females into this field of studying," she said.

"There is a lot of emphases placed nowadays on encouraging more females to enter Science, Technology, Engineering and Mathematics (STEM) fields that were traditionally dominated by males in the workforce."

Ligacere currently teaches classes that consist of female automotive engineering students and said she was excited about welcoming and training more females in the future.

"Females can make a difference in any field they are in."

Cakaunivalu embraces the tech world

Although many children would reflect on certain childhood highlights and memories that laid the foundation of their future career ambitions, there are some whose dreams are shaped due to the absence of these experiences.

Growing up in her village of Nakavika, Wainikoroiluva in the Namosi Highlands, technology and the access to electrical appliances was a world away for Salote Vakavudali Cakaunivalu.

"We didn't even know how to switch on computers," she shared. "I was brought up in the village and I'm very proud of my humble upbringing as the only child in my family."

"My mother was a nurse based at the health station near my village so for us, life was all about working on the farm, going to school at the local village school and living a simple life."

"However, in the back of my mind, I decided that I wanted to learn about technology because this was something my family and I and those around us in the village were not very aware of."

Watching on as a primary school student whilst her mother, struggled with typing assignments in a rush at the internet shop in town was the final push that prompted Cakaunivalu to study in a field that was foreign to her at the time.

"I will never forget what my mother always told me – study hard because nowadays, everything revolves around technology, so you have to know these things."

"After high school, I came straight from a rural community into the city and enrolled in the Bachelor of Computing Science and Information Systems degree programme at Fiji National University (FNU)."

"You can imagine that the struggle was real when I had to learn about and actually touch the computers," she said with a laugh.

When questioned on her experiences as a female studying in a STEM (Science, Technology, Engineering and Maths) field, Cakaunivalu immediately stated that she knew beforehand that her field of study was traditionally male-dominated.

"This field is already challenging enough so it doesn't matter whether you are male or female. Everyone needs to be determined and make sacrifices in order to overcome the challenges and complete our studies successfully."

Cakaunivalu said she looks up to her female lecturers, her parents and classmates as motivation and when quizzed if she saw herself as a role model to younger females who wished to study in the field of technology, her answer was a bold "yes".



Making a difference with scientific research



Research assists in the creation of a stronger knowledge-based society. These are the sentiments of young Ashna Prasad, who is still relatively new in the field of research but is already fascinated with it.

Prasad, a final year Bachelor of Medical Laboratory Science student at the College of Medicine, Nursing and Health Sciences (CMNHS), said the College had excellent academic staff who guided the students with their interest in the field.

While the research component is part of her programme, the lass from Rakiraki said, it was something that she wants to continue to undertake and explore.

"My supervisor, Dr Aruna Devi, is very helpful and she has in-depth knowledge in the field of lab sciences, which assists me in pursuing my research interests."

Completing her secondary studies from Penang Sangam High School, Prasad always had a special interest in the science-related subjects.

"I took up sciences in high school because I always wanted to be a medical professional and coming to CMNHS—I have been exposed to new horizons within the subject."

"The Medical Lab Sciences is very interesting because there is something new to read and learn every single day."

"There are numerous innovations and the field of sciences

provides answers to most of the questions which intrigue me," she highlighted.

Now that Prasad has found her passion for scientific research, she hopes to become a medical lab scientist and complete graduate-level qualifications as well.

"I aim to create further awareness and monitor the emergence of antibiotic resistance among our communities."

The charismatic student also encouraged more women to participate and invest time in conducting scientific research which would create a large pool of relevant information.

"This will then help us to take a proactive approach towards dealing with emerging and long-standing health issues," Prasad added.

The College hosts an annual Pacific Islands Health Research Symposium to provide a space for its staff, students, regional and international participants to share their research findings and build further collaborations.

CMNHS Associate Dean Research, Dr Donald Wilson, said they were impressed by undergraduate students interest in research.

"I think our supervisors have done a sterling job of ensuring that the students are prepared well, that they respond well and it is evident that they are prepared to go further with their research," Dr Wilson commented.



Valemasi's curiosity leads to Electrical Engineering studies

While growing up in Nakoroboya in the interior of Ba, Ana Valemasi and her family did not have the luxury of electricity supply at home. This fueled her curiosity, and her eyes would light up whenever she saw lights in other homes at night.

This fascination quickly developed into a passion to pursue science and technology subjects in secondary school and in the university.

Currently, Valemasi is enrolled in Certificate IV in Electrical Engineering offered by Fiji National University's (FNU), College of Engineering, Science and Technology (CEST) at Ba Campus. The budding electrician said as a child, she was known to ask her father a lot of questions regarding electricity.

"I was a curious child, and despite not having electricity at home, I had a fascination with power. Dad always used to tell me that electricity powers every equipment and technology that we come across in our daily lives and that I need to study electrical engineering if I need to get more knowledge and answers to my questions," she said.

As Valemasi matured, she realised that electrical engineering involved generating

electricity, transmitting electricity, transmitting power from where it was created to where it is used, and developing equipment that uses electricity to improve lives.

"As a child, I did not know much about electrical engineering except that it had something to do with power. Despite not having electricity at home, I was always trying to do little projects at school involving electricity," the former Ba Sangam student said.

Valemasi believes that electrical engineering is an essential part of what makes the world function, and she can easily fit into any industry with electrical engineering.

"Nowadays every field is using electrical gadgets, for example, in the medical arena, particularly the radiography field has improved significantly with the innovations and inventions," she said.

Her advice to young girls is to pursue studies in electrical engineering, as this will open many opportunities. "Don't ever let anyone say to you that you can't do anything! You need to try and believe in yourself," she said.

Valemasi encouraged young girls to pursue a career in science, technology engineering, and math (STEM) fields.

Verebasaga eyes a career in Aviation

In 2014 young Julia Verebasaga and her classmates from Adi Cakobau School (ACS) visited the Fiji National University's (FNU) Open Day at Derrick Campus in Samabula.

For the Year 11 student, it was an exciting day as they would get a 'day-off' from studies, travel from Sawani to Suva and spend some time having fun at FNU before returning to Sawani.

The possibility of getting a 'fix' on what programme she intended to pursue at this point for Verebasaga was somewhat an illusion as she had not given tertiary education studies much thought. However, much to her surprise, not only did she find programmes that interested her, she was able to confirm what she wanted to study.

"Our school attended the FNU Open Day, and the School of Aviation had their booth set up at the Samabula Campus. They had this huge gas turbine engine set in the front. A few aviation students did a small presentation on what aircraft engineering is all about, how the engine works and the tools that they use."

"I became fascinated about it all, and I decided there and then that I wanted to become an aircraft engineer," the 21-year-old said.

Verebasaga is currently in her final semester completing the Certificate IV in Aircraft Maintenance Engineering (Mechanical) at FNU's Nadi Aviation Campus.

While growing up in Qauia, Lami, Verebasaga said she always had the passion for repairing things from a young age.

The Kadavu lass admits there is a gender imbalance in science, technology, engineering, and mathematics (STEM) fields.

"I personally think that at times, we are considered fragile because of our physique and that we would not be able to perform some technical work that is similar to the standard of how a male does it," said Verebasaga.

"But I do believe that if we do our work to the best of our ability with integrity, honesty, and determination, anything is possible and we will get the recognition and respect we deserve as a woman working in a male-dominated field," she added.

Having the zeal to excel, Verebasaga strongly believes that parents, guardians, and teachers should create enabling an environment for females that encourage and promote STEM subjects.

Verebasaga, the baby of her house, is thankful to her parents and four siblings for supporting her to follow her chosen career.

"Dream big. Don't be scared to do something different. Have perseverance and don't let setbacks stop you from achieving your dreams," she said.

After graduation, the Verebasaga aims to join the local aviation industry.



Verebasaga (left) with her classmates.

Friends team up to mentor aspiring medical science students



Dr Serene Shrestha (right) and Dr Salma Khan.

Almost three decades ago, her parents travelled halfway across the globe from Kathmandu, Nepal to settle in Fiji and now she is using their inspiration to mentor aspiring students pursuing the field of Medical Sciences.

Dr Serene Shrestha, a Problem Based Learning Lecturer at the College of Medicine, Nursing and Health Sciences (CMNHS), is gratified by the opportunities presented to her by the College.

"CMNHS has been very supportive of staff in terms of organising and/or sending us for Medical Education workshops, which in turn further improves our ability to facilitate student learning," she said.

With a focus on pursuing her Masters qualifications, the former Suva Grammar School student believes "science is something that is fun and interesting".

While pursuing her Bachelor of Medicine and Bachelor of Surgery from the then Fiji School of Medicine (now CMNHS), she also networked with students from across the region and built acquaintances, many of whom she works with.

One such acquaintance, Dr Salma Khan, also a Lecturer - has now become a good friend.

"We did not know much about each other from our medical student days but now that we are working together, there is a certain degree of relativity and comfort so it makes our aim of

mentoring students even more exciting," Dr Khan said.

The two friends share the same office space and are using the attributes instilled in them by the Medical College to nurture young medical science students.

Dr Khan, originally from Lautoka, said she was the only child in her family to become a Doctor and that in itself was a motivation for her to further her studies in Masters of Medical Education.

"Devoting study time for a career in medicine is very fulfilling and enriching as it makes you feel special and empowered to help other people, and have a sense of satisfaction that at the end of the day, someone is feeling better because of you and that is invaluable," she said.

A usual day at work for the two friends and colleagues is about carrying out tutorials, engaging in clinical skills demo sessions, taking students out for clinical attachments, assisting with exam preparation and other administrative duties pertaining to course work.

Medical Sciences programmes that are STEM disciplines include Chemistry, Biology, Biomedical and Medical Engineering, Medical Laboratory Science, Dentistry, Optometry, Pharmacy and Pharmaceutical Sciences, Biological and Physical Sciences, Public Health and Veterinary Medicine, amongst others.

Laboratory Science and Medical Labs

Ritambhara’s favourite time in high school used to be during Science laboratory classes. She was her happiest when surrounded by microscopes, petri dishes and slides.

Today, she has a much larger laboratory to work in and is the Acting Lab Superintendent of Lautoka Hospital.

“I like to believe that the field chose me. Everything about it intrigues me,” she said.

Medical laboratory scientists are key members of the medical society, working in all areas of the clinical laboratory, including blood banking, chemistry, hematology, immunology, histology and microbiology. They perform a full range of laboratory tests – from simple prenatal blood tests to more complex tests to uncover diseases such as HIV/AIDS, diabetes, and cancer. Their information influences the medical treatment a patient will receive.

Education and Career

Ritambhara was born and raised in Fiji’s Sugar City – Lautoka. She attended Lautoka Primary School and Natabua High School. After high school she moved to Suva to pursue further studies at the Fiji School of Medicine (FSM), now the Fiji National University’s (FNU), College of Medicine, Nursing and Health Sciences (CMNHS).

Staying true to her interest, she enrolled in the Diploma in Medical Laboratory Technology programme. The year was 1998 and was the first time for her to be away from home.

“I was very excited to embark on this journey. Although I would be away from home, I had a number of friends from high school going to FSM so I was not worried,” she said.

Ritambhara graduated in December 2000,

after two years of study.

“My time at FSM was great. I made a lot friends and most of them are still my friends. I remember participating in the Indian Student Association activities with friends. This used to be something we always looked forward to – was an excellent diversion from studies. My best memory, however, is when I was presented the highest scorer award for Haematology and Blood Bank subjects,” she reminisces.

She completed her internship at the Colonial War Memorial Hospital (CWMH) and was then posted to the Lautoka Hospital as the Biochemistry Section Technician.

Her role included analysing all types of specimen received in the section using automated and manual methods as applicable, performing venipuncture, recording and interpreting results effectively, performing on-call duties and assisting other on-call staff.

While working she also enrolled in the Bachelor in Medical Laboratory Science programme at FSM as a part-time student.

After serving as the Biochemistry Section Technician for almost nine years, she was promoted to Head of Biochemistry section at the Lautoka hospital in January 2009. She graduated with a Bachelor in Medical Laboratory Science in the same year.

Ritambhara was a dedicated student and maintained a sheer interest in learning more and upgrading her qualification. As such after attaining a Bachelor’s qualification, she enrolled in the Postgraduate Diploma in Health Service Management programme at FNU as a part-time student. She graduated in December 2014 and moved to Suva to work at the Logistics Management Unit of the Fiji Pharmaceutical and Biomedical Supplies Center as the



Logistics Coordinator (Laboratory). Her key role was to maintain supply chain of laboratory reagents and consumables.

“I love laboratory science. Keen to learn more, I always read about it and I believe upgrading my qualification also allows me to enhance my knowledge and skills and contribute more towards the health of the country,” she shares.

In 2016, she moved back to Lautoka Hospital as the Senior Technical Officer. This is an administrative role, ensuring optimum quality and excellent service delivery to the public. She also enrolled in the Master of Health Service Management programme at FNU and is currently the Acting Laboratory Superintendent at the Lautoka Hospital overseeing the operation of the Pathology Laboratory at the Lautoka Hospital. She is also responsible for technical matters at the Sub Divisional Laboratories for Western Division.

“I enjoy the scope of my current role which

includes planning, operations, monitoring and evaluation and risk mitigation,” she added.

Words of Wisdom

Ritambhara shared her top three tips for those starting out in their careers.

“The three most important and basic tips for anyone starting a career are to develop good time management habit, learn to be a team player and focus on good quality of work. This will take you a long way. These tips are guaranteed to give you success in whatever work you do,” she said.

She also shared a piece of advice with students saying that education is a life long journey which should not stop with the first formal qualification.

“There is always room for improvement or upgrade,” she added.



Ritambhara (middle) and the lab team.