The STEM Network

A Publication of NIHERST

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What's Inside

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NIHERST and MYDNS Pen Agreement

The National Institute of Higher Education (Research, Science and Technology) (NIHERST) and the Ministry of Youth Development and National Service (MYDNS) jointly conveyed its intent to maximize the nation's youth involvement in Science, Technology and Innovation (STI).

This partnership was advanced by an official Memorandum of Cooperation (MoC) signed by Mrs. Marleen Lord-Lewis (President, NIHERST) and Mr. Farook Hosein (Permanent Secretary, MYDNS) at NIHERST's Head Office, Port of Spain.

The collaboration, inter alia, is tailored towards growing the capacity and capability of Science, Technology, Engineering and Mathematics (STEM) Education and 21st Century Skills Development among our young people.

Expressing her thoughts on the collaboration, Mrs. Lord-Lewis stated, ***"The nation's youth continues to be a major focus of NIHERST. The strategic partnership harnessed between the Ministry and the Institute will only serve to drive our young people toward developing their full potential. This investment in turn will evidently aid in shaping our society into a STEM-educated environment that mirrors our sustainable development goals"***.

Expressing similar sentiments, Mr. Hosein highlighted, ***"The well-crafted partnership with NIHERST rests on the foundation of the Ministry's intention to harness youth social and intellectual capital. This agreement will help our young people to navigate this era with the necessary skills and competencies to achieve their highest potential."***

As the state agency responsible for the development of science,

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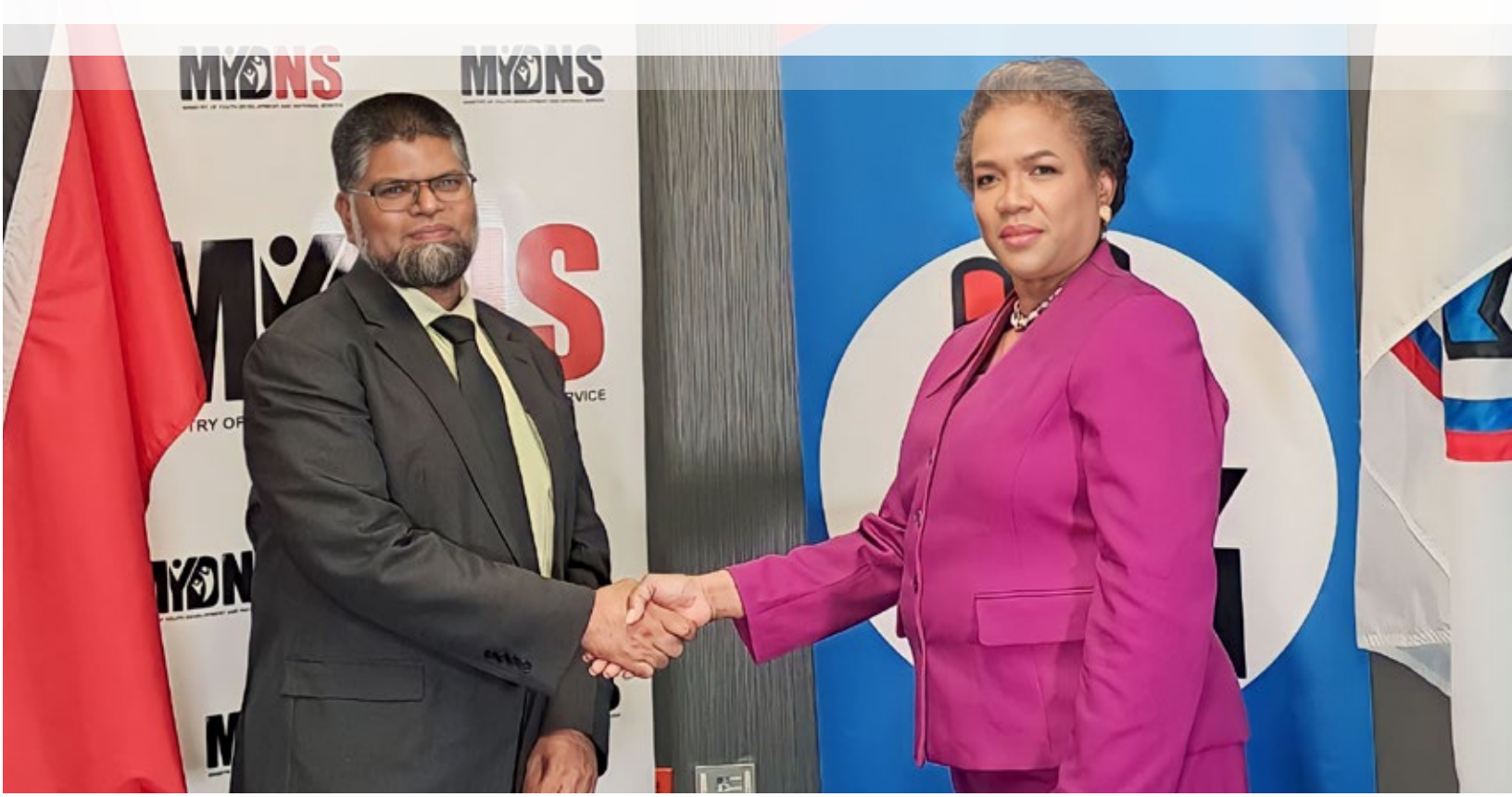
NIHERST and MYDNS Pens Agreement

technology and higher education, NIHERST's mission is to stimulate sustainable national capability and capacity in Science, Technology, Innovation, and Technopreneurship through insightful research and relevant programmes.

The Ministry of Youth Development and National Service is guided by the National Youth Policy (2020-2025), which focuses on the empowerment and strategic engagement of our youth, as co-creators of sustainable development initiatives. In particular, Pillar 2 promotes "Harnessing youth social and intellectual capital" which aims to develop technologically savvy and technically competent young people in Trinidad and Tobago.

Guided by a common focus it is expected that this partnership will reap the necessary rewards to advance our society to a socio-economic, sustainable and transformational future.

Look out for the coming initiatives.



Mr. Farook Hosein, Permanent Secretary, MYDNS (left), Mrs. Marleen Lord-Lewis, President, NIHERST (right)

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The NIHERST STEM Exploratorium

During the July/August school vacation, NIHERST was proud to welcome **over three thousand (3000) visitors** to the STEM Exploratorium. Utilized as a field trip destination for campers and many others, the NIHERST STEM Exploratorium offered a unique opportunity to immerse visitors in a dynamic environment where science, technology, engineering and mathematics came to life.

With a variety of captivating exhibits, innovative demonstrations and interactive activities, the space was modelled to inspire curiosity, spark creativity and ignite a passion for STEM among our visitors.

From the youngest learners to seasoned enthusiasts, the NIHERST STEM Exploratorium accommodated a wide range of audiences, encouraging them to explore, experiment and discover the thrilling world of STEM. Whether it's tinkering with engineering marvels, unlocking the secrets of coding and robotics, or unraveling scientific mysteries through captivating demonstrations, this exhibition space promised and delivered an enriching experience for all.

Amidst all the excitement, the NIHERST team was particularly pleased to welcome the Honourable Dr. Nyan Gadsby Dolly, Minister of Education, a group of talented students from San Andrés, Colombia, and Dr. Astril Webb, President of Kinder International LLC.

The Honourable Dr. Nyan Gadsby-Dolly Minister of Education (centre), with visitors of the NIHERST STEM Exploratorium

Students from San Andres, Colombia

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The Introduction of Epigenetics to the Healthcare System in Trinidad and Tobago

Like many countries, Pan-American Health Organisation (PAHO) research shows that Trinidad and Tobago (T&T) is suffering from the growing issue of non-communicable diseases (NCDs) - heart disease, stroke, diabetes, cancer and chronic lung disease. T&T has seen a considerable shift from communicable diseases to NCDs over the last fifty (50) years. Scientist Jorge Alejandro Alegría-Torres explains that four (4) drivers of this prevalence are:

- Environmental Toxicants - chemicals, pesticides and heavy metals
- Settings – home and work environment in utero (mothers' diets during pregnancy)
- Individual Characteristics – age, gender and genetic make-up
- Lifestyle – tobacco/alcohol abuse, physical inactivity and unhealthy diets.

Over half of T&T's population contend with three (3) or more of these risk factors, resulting in NCDs accounting for over sixty-two percent (62%) of deaths annually; of which, according to PAHO, seventy-five percent (75%) occur in people under seventy (70), classifying them as premature deaths. In 2021, the Ministry of Health joined the Universal Health Coverage Partnership to strengthen the health system and move toward NCD prevention and control. Notably, the introduction of epigenetic research is a tool to win the fight against NCDs.

Epigenetics is the study of how your environment and lifestyle choices can cause modifications to DNA turning genes on/off without changing your DNA sequence (Medline Plus). Epigenetic modifications allow different cells to generate proteins specific to their function. The most common epigenetic modification is DNA methylation, It is the attachment of methyl molecules (1 carbon and 3 hydrogen atoms – CH3) to genes, consequently shutting them off. Conversely, demethylation removes the methyl groups, which activates the gene. According to scientist Dr. Paula Lorenzo, methylation or demethylation of the wrong genes causes NCDs to arise. The CDC cites one example, the methylation of the BRCA1 gene, resulting in the increased risk of breast cancer. These modifications can be passed onto the next generation, predisposing offspring to NCDs and other genetic diseases. They further explain that not all epigenetic modifications are permanent; they can be reversed through behavioural and environmental changes such as a healthy diet and consistent exercise.

NIHERST as a member of the International Centre of Genetic Engineering and Biotechnology (ICGEB), can collaborate with the Ministry of Health to educate the public on epigenetics and the drivers of negative modifications. NIHERST can contribute to the development of healthcare systems that provide citizens with DNA and epigenetic sequencing services highlighting the lifestyle changes needed to prevent or reverse them. Understanding epigenetic modification will help T&T develop a healthy society relieved of the growing burden of NCDs.

Prepared by: **Mandela Sealy**
Policy, Research and Intelligence Unit

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Ultim8 STEM

Game Studio, BioMed Adventure and STEM Athletes are a few of the thrilling themes that were introduced to the young enthusiasts at the NIHERST July/August Camps.

No stranger to exposing young children to Science, Technology, Engineering and Mathematics (STEM), the JAVA 2023 cycle of NIHERST Vacation Camps once again contributed to the development of the next generation of STEM leaders by providing the youth with opportunities for constructive learning of STEM content.

Project Officer, Ms. Adafih Thomas stated, ***"These camps are launch pads for young minds. As seeds of innovation, youth participants discover the joys of inquiry and experimentation, gaining the confidence to navigate the complexities of our ever-evolving world. These experiences sculpt not just future engineers and scientists, but well-rounded, global citizens, capable of transforming society for the better. STEM education empowers them to shape the future."***

The camps used both hands-on activities and interactive technology to ignite curiosity and educate participants about phenomena in the natural and physical world. Held both virtually and in-person at various NALIS locations, campers were extremely eager and anticipatory as they engaged in the activities that were designed to stimulate their curiosity in STEM and to build critical 21st century learning and innovation skills such as problem-solving, critical thinking, teamwork, communication and creativity.

Stay connected to our social media pages for our camp testimonials.

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Unveiling Insights: Science and Technology Statistical Department's Impactful Role in Data Analysis and Innovation

From launching the Caribbean's first Science and Technology festival to laying the groundwork for the establishment of COSTAATT, NIHERST has been a local pioneer in Science, Technology and Innovation. The Institute further progressed by establishing its own S&T Statistical Unit in 1998.

The unit was designed to collect national indicators of STI and maintain a database of statistics that feed into international data systems, namely United Nations Educational, Scientific and Cultural Organization (UNESCO) and the Ibero- American Network for Science and Technology Indicators (RICYT). Such data support effective STI planning specifically with regard to education, expenditure and manpower and economic performance.

To date the unit has produced a total of thirty plus (30+) surveys delivering statistics on topics such as Human Resources in S&T and Measuring the Investment in Science and Technology.

Currently the Unit is in the process of producing two reports.

1. **National STREAM Workforce Development Report**- The purpose of the report is to strengthen the labour force by providing data on the STREAM workforce that would inform policy makers, education specialists, industry and all stakeholders in creating policies to build the Science, Technology, Engineering, Art and Math (STREAM) capacity and capabilities of the country. This data will also guide projects and programmes promoting STREAM careers that are essential to national development.

2. **Assessment of STEM labour needs in emerging sectors**- This assessment will be used to reinforce emerging sectors by providing data on the supply and demand of STEM graduates in the priority sectors identified in Trinidad and Tobago's diversification strategy. This would inform policy makers and industry stakeholders in creating policies to develop the supply of STEM graduates in the country.

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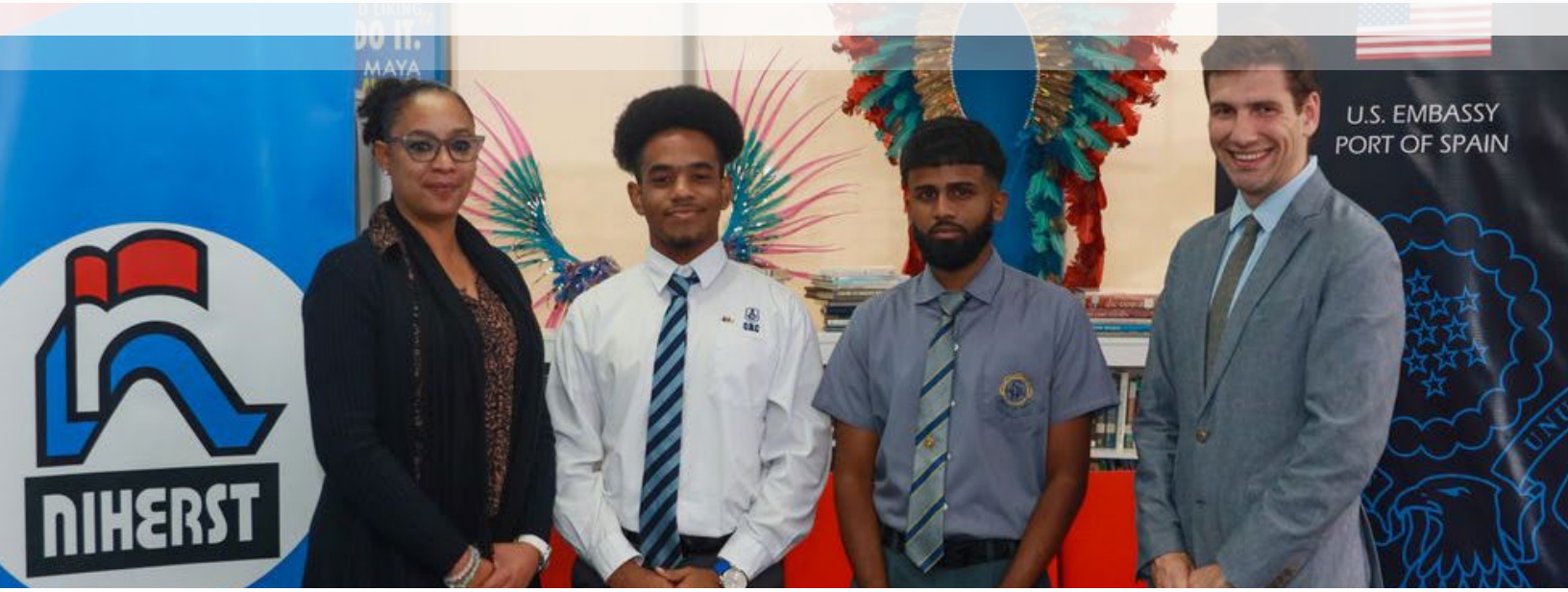
NYSC 2023

For yet another consecutive year, NIHERST in collaboration with the U.S. Embassy, Port of Spain is proud to award two (2) National Youth Science Camp (NYSC) scholarships. The successful students, Mr. Amarnath Choon and Mr. Daniel Sebro had the privilege of joining a cross-continental contingent in the latest installment of the camp.

NYSCamp is a residential Science, Technology, Engineering, Arts and Mathematics (STEAM) programme designed to honour and challenge some of the nation's rising leaders and provide them with opportunities to engage with STEAM professionals and participate in exciting outdoor activities.

The programme is always geared towards inspiring lifelong engagement and ethical leadership in Science, Technology, Engineering, Arts, Mathematics, and related fields as well as encouraging participants to pursue STEAM careers and related professions through their increased awareness and understanding of the current education, research and career opportunities.

Speaking at the meet and greet at the U.S. Embassy, both Mr. Amarnath Choon and Mr. Daniel Sebro expressed their excitement towards the programme. The scholarship winners were eager to further their studies at the tertiary level and broaden their perspectives on future careers in STEAM.



From Left: Lovaan Superville, V.P., Science and Technology (Ag.) - NIHERST, Daniel Sebro, NYSC Awardee (Queens Royal College), Amarnath Choon, NYSC Awardee (Shiva Boys' Hindu School) and Eli Levine, Assistant Public Affairs Officer (U.S. Embassy, Port of Spain)

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NIHERST address COMCYT

At the Tenth Meeting of the Inter- American Committee on Science and Technology (COMCYT), of the Organization of American States (OAS), NIHERST President, Mrs. Marleen Lord- Lewis had the privilege of delivering a featured presentation.

The mission of the COMCYT is to contribute to the definition and execution of OAS policy on scientific, technological and innovative partnership for development. Its goal is to coordinate, provide follow-up and evaluate the partnership opportunities for development of the Organization in the sector of science and technology.

At the meeting entitled: "Youth: Enhancing Skills and Preparing for Industry 4.0", Mrs. Lord-Lewis delivered a comprehensive visual presentation on Trinidad and Tobago's best practices and programmes for youth technological training, NIHERST's overall strategy and implementation initiatives.

She highlighted NIHERST's alignment towards helping the country achieve its Sustainable Development Goals particularly, Goal 4 and Goal 9 which aim to increase the number of youth and adults with relevant skills for employment and entrepreneurship.

Mrs. Lord-Lewis impressed, ***"We believe that beyond work-specific skills, it is important to develop high-level cognitive and soft skills such as problem-solving, critical thinking, creativity, teamwork and communication skills that can be used across a range of occupational fields."***

Notably, in her address she provided the international audience with testaments of NIHERST's investment in improving youth skills and their readiness for Industry 4.0. She mentioned the Institute's science popularization programme via outreach initiatives which have reached approximately 2.3 million students across Trinidad and Tobago and the wider Caribbean.

Mrs. Lord-Lewis also highlighted a brief performance on our Teach ME Virtual Curriculum Competition which aims to support teachers in remote teaching by developing their digital and presentation geared towards building our youth readiness for Industry 4.0.

Before closing her address, and understanding the vast investment necessary on all fronts for the advancement of youth, President Lord-Lewis, invited all interested agencies to engage in partnership talks with the Institute.

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The FIRST® LEGO® League Returns

Scores of onlookers and approximately two hundred (200) participants, from across various schools in Trinidad and Tobago attended this year's FIRST® LEGO® League National Tournament, hosted by the National Institute of Higher Education, Research, Science and Technology (NIHERST) and Shell Trinidad & Tobago Limited (Shell).

The FIRST® LEGO® League is a global programme with a presence in eighty (80) countries. The initiative which utilises theme-based challenges to engage students in research, problem-solving and engineering, impresses its core values of the contribution of others, learning, and community involvement to its competitors.

At the prize-giving ceremony, at the National Cycling Velodrome, awardees were presented with over $125,000 in prizes for awards which included Core Values, Robot Design, and Innovation Project.

At the ceremony, NIHERST, as the operational partner of the programme in Trinidad and Tobago, invited one of its Governors, Ms. Sharon Baboolal, to deliver remarks. Ms. Baboolal highlighted **'We firmly believe that initiatives like the FIRST® LEGO® League are instrumental in nurturing young talent and enabling them to explore their potential.'**

As she directed her attention to the participants she exclaimed, **'Our greatest investment is in you - The ones who can make a difference in our communities and chart a course that can transform our society to be admired by generations to come. We stand firm in our mandate to foster a culture of scientific discoveries, technological advancements, and innovative development, but without the core asset, of our youth, none of these will be possible.'**

Platinum sponsor of the FIRST® LEGO® League National Tournament and patron of the Shell STREAM Programme, Shell T&T Ltd. was represented by its General Manager-Business Transformation, Ms. Anesha Sadar, who stated, **'Shell Trinidad and Tobago is proud to be the platinum sponsor of the FIRST® LEGO® League. STREAM (Science, Technology, Research, Engineering, Art and Math) education challenges our current thinking to find creative solutions to the problems we face today as a society. The FIRST® LEGO® League is one of the many avenues that provides the support young people need to generate ideas that will pave the way to a sustainable future. '**

Ms. Tricia Gilkes, Curriculum Coordinator, within the Ministry of Education who brought remarks on behalf of the Honourable Minister of Education, expressed **'the FIRST® LEGO® League programme is always a welcomed educational resource and solution for 21st century teaching and hands-on learning.**

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The FIRST® LEGO® League Returns

This initiative is an exciting way that serves to advance not only the Ministry's drive toward Digital Transformation, but that of Trinidad and Tobago and its Sustainable Development Vision: 2030.'

In its final remarks, NIHERST extended its gratitude to the event's silver sponsor Phoenix Park Gas Processors Ltd., as well as bronze sponsors, Massy Foundation, Republic Bank Ltd and Radio Shack, and in-kind sponsor, Sunshine Snacks-Zoomers.

Look for details on the upcoming season, 'Master Piece'.

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How are YOUth?

At the center of the Institute's vision is our passion to propel the nation's youth in a direction that will allow them every opportunity to excel. We acknowledge that while efforts are ongoing the youths are hindered due to their unique challenges.

With this in mind, NIHERST had no reservation with continuing its collaboration with WRAP TT (Women's Roundtable Action Platform – Trinidad and Tobago) to host How Are YOUth? – Providing Mental Health Solutions to quell some of these challenges.

The roundtable discussions focused on the postpandemic stressor of anxiety.

The primary goal of the webinar was to raise awareness amongst the youth of the realities of mental health and mental illness, with the intention to encourage, empower and inspire them to be active participants in ensuring that they are mentally well.

The virtual forum was designed to be an open and inclusive space for young people to share their experiences with professional input and guidance from our panel of experts who provided insights, practical advice, and strategies to support the youth in identifying, managing and overcoming the challenges associated with anxiety.

On the panel were, Ms.Cherene Mohammed - Psychologist (Ministry of Labour), Mr. Tevon LaRose - Educator (Trinity College, Moka), Ms. Carlan Telesford- Educator (Morvant Laventille Secondary School), Dr. Joanne Spence- Behaviour Change Consultant (The Therapeutic Assessment Centre), Mr. David Bailey- Youth Representative and Ms. Brianna Merritt - Youth Representative, all of whom, shared their coping strategies.

Stay tuned for the upcoming installment of How Are YOUth?.

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STEM equals SUCCESS

A Marine Biologist, Data Analyst, Petroleum Engineer, Animator and not to mention a Forensic Science Technician, are but a few of the bold careers that one will encounter along their STEM journey. But why is STEM so important to a progressive nation?

Yes, we, know that STEM means Science, Technology, Engineering and Mathematics, but to take a deep dive into the answer, a STEM curriculum integrates multiple disciplines and trains students to use cross-disciplinary knowledge to solve challenging problems. With this form of learning it allows the students to think critically, preparing them for careers and creating professionals that can work across scientific disciplines.

One can even argue that whether or not you want to pursue a STEM job, education in this area can still be an asset in your future job search and life journey as a result of the skills that you develop. When you pursue studies in this field, you're not limited to a career in science, technology, engineering or mathematics, but rather due to it teachings you will be well - positioned to succeed in any field of your choosing.

This is one of the main reasons why NIHERST is such a strong advocator of STEM programmes. We believe that the future success as it relates to all aspects of our national landscape, especially that of youth advancement is strongly linked to STEM education. In fact, the team at NIHERST has exercised all resources in this investment and will continue to roll out campaigns that will showcase the linkage between STEM and Career Success.

Interested in being a part of our STEM careers database, email marketing@niherst.gov.tt.

Orbit Spotlight

featuring Ms. Nandi Ogiste - Registrar (Ag.)

Orbits are the result of a perfect balance between forward motion and the pull of gravity.

Q: *Whats is one snack you cannot live without?*

A: *Chocolate.*

Q: *Name a book that you would recommend to anyone.*

A: *The Power of Now by Eckhart Tolle.*

Q: *What advice would you have for someone trying to achieve a goal that seems impossible?*

A: *Take it in baby steps. Ensure you have a plan with realistic steps to get to your seemingly impossible goal. Revisit and revise your plan as things change - and things will change. Consider seeking the advice of someone who has walked that road before. Most importantly, believe in yourself.*

Q: *What is something that you know now, that you wished you knew earlier in your career?*

A: *There is great value in having a mentor, someone who can provide you with advice, open doors or opportunities for you and help you along the difficult paths in life.*

Q: *What would you say is the key to the accolades you have received thus far?*

A: *Strong family support, discipline, focus, resilience, love for learning, ability to think and God's blessings.*

Q: *Besides your phone, can you name an accessory you cannot live without?*

A: *I actually can live without a phone. I can adapt quickly when necessary.*

Q: *What advice would you give to your 16-year old self?*

A: *There will always be ups and downs. Keep focussed on your goals and keep moving forward.*

Q: *Do you believe that your birth position played a major factor in the person today?*

A: *To some extent, yes. Socialisation developed core values and being the firstborn I was expected to be responsible, disciplined and a good example.*

Q: *The best advice you ever got and from whom?*

A: *I have received some great advice in different facets of my life. One that probably is most relevant to this context is advice from a past lecturer - Never be too quick to apply a solution to a problem without first fully understanding the cause and context.*

NIHERST

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