



Measuring the Investment in Science and Technology



The background features a large, semi-transparent watermark of the NIHERST logo. It consists of a stylized graphic of an open book with two pages, a large archway below it, and the acronym 'NIHERST' in a bold, sans-serif font at the bottom.

**National Institute of Higher Education, Research,
Science and Technology (NIHERST)**

Science and Technology Statistics Department

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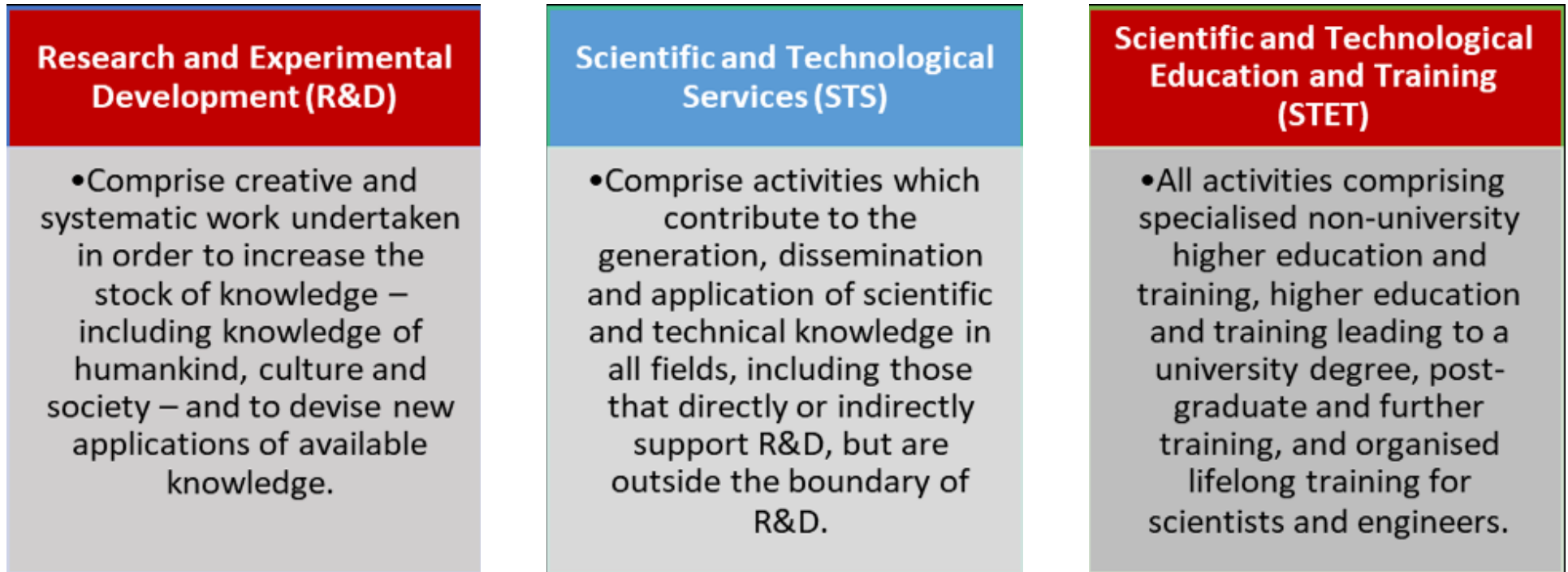
Since 1999 NIHERST, guided by the Network for Science and Technology Indicators –Ibero-American and Inter-American– (RICYT) and the UNESCO Institute for Statistics (UIS), has been measuring the investment in Science and Technology (S&T) by gathering data on expenditure and human resources dedicated to S&T through its annual survey of S&T indicators. The survey captures data on two of the three components of scientific and technological activities (STA): Research and Experimental Development (R&D) and Scientific and Technological Services (STS). The objective of this study is to provide S&T indicators to:

- improve evidence-based decision making by policy-makers
- populate RICYT and UNESCO-UIS databases of S&T indicators
- monitor national and global development strategies
- calculate global indices
- benchmark against developing and developed economies
- serve as reference data

The 2030 Sustainable Development Agenda positioned Science, Technology and Innovation (STI) as the key means for the achievement of the Sustainable Development Goals (SDGs). STI is important for social, economic and environmental development and plays a key role in achieving the development targets identified in the Vision 2030. Therefore collecting S&T indicators is crucial to enable evidence-based decision making by policy-makers in T&T. The formulation of any S&T policy, plan or programme for the promotion of sustainable development require current, reliable and comprehensive data on the investment in S&T in the country.

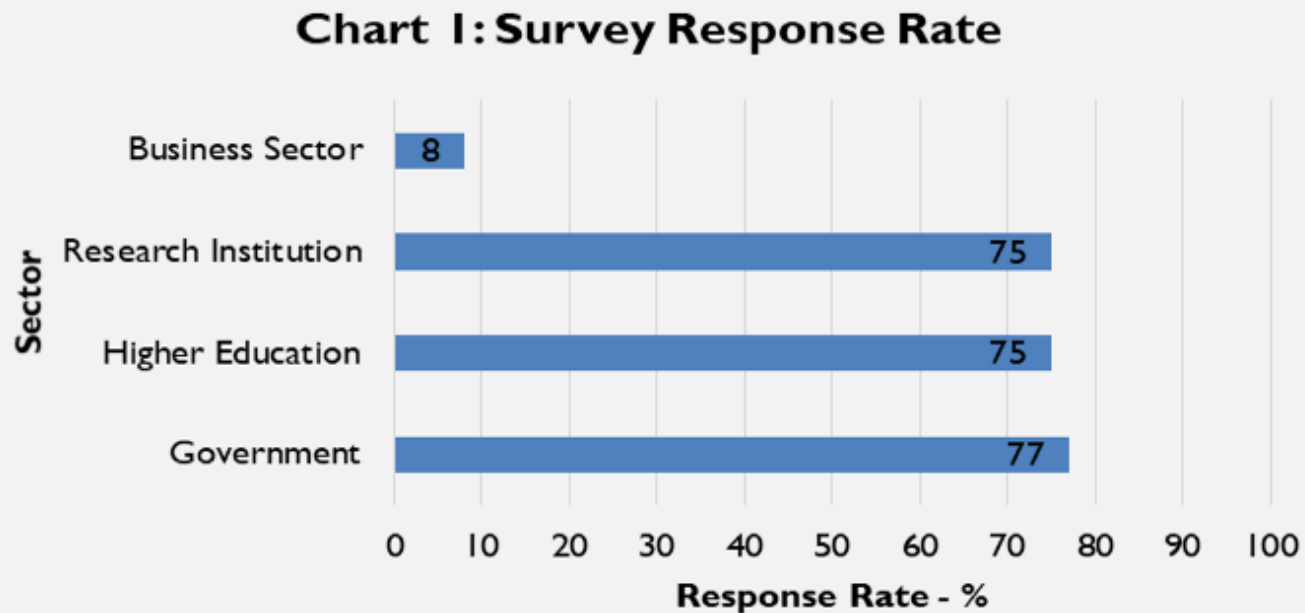
Investment in S&T is measured using the OECD Frascati Manual (2015) which is the internationally recognised methodology for collecting and using S&T statistics. The manual defines scientific and technological activities (STA) as **‘systematic activities which are closely concerned with the generation, advancement, dissemination and application of scientific and technical knowledge in all fields of S&T’**.

Diagram 1: Components of STA



Survey of S&T Indicators, 2022

The Institute completed the Survey of S&T Indicators in the third quarter of 2022. This survey collected S&T data for the period 2020-2021.



The results of the survey are presented in the various tabulations and charts which follow. Additionally, time series of some key indicators are also represented using past survey results. The business sector is not represented in the results due to the low response rate and limited data supplied by those who responded. The S&T indicators are also available on the NIHERST website and upon request to the S&T Statistics Department.

Survey Results

Research and Experimental Development (R&D)

Table 1: R&D Expenditure, 2016 - 2020

Year	Total expenditure on R&D \$TTM	R&D expenditure as a percentage of GDP
2016	136.50	0.08
2017	138.84	0.09
2018	131.1	0.10
2019	95.75*	0.06
2020	91.48 ¹	0.06

*The pandemic affected coverage in the higher education and business sectors

¹No coverage of the business sector due to low response rate

**Chart 2: Expenditure on R&D (TT\$M)
2016 - 2020**



Chart 2 shows that over the period 2016 to 2020, R&D expenditure declined from \$136.5M to \$91.5M.

**Chart 3: R&D expenditure as a percentage of GDP
2016 - 2020**



Chart 3 shows over the 5-year period expenditure on R&D averaged 0.08% of GDP.

Chart 4: Global R&D Expenditure

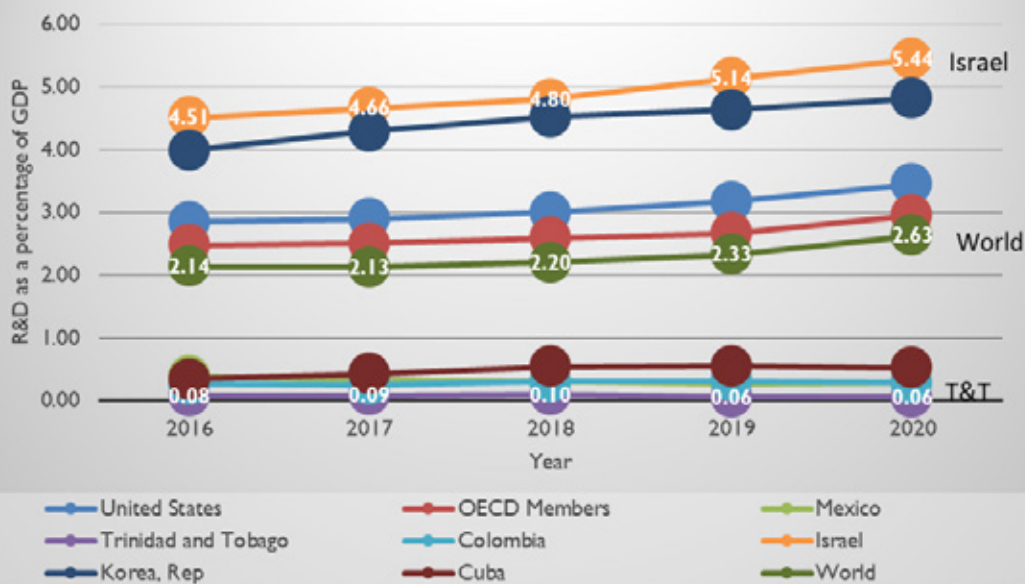


Chart 4 illustrates that for the period 2016 to 2020, expenditure on R&D as a percentage of GDP was below 0.1% for Trinidad and Tobago compared to the world average of 2.29%.

Table 2: R&D Personnel, 2020

R&D Personnel	2020 (Headcount)	2020 (Full-Time Equivalent)
Total	3047	2106
Researchers	1336	894
Technicians	635	406
STS Personnel	1076	806
Males		
Total	1605	1120
Researchers	652	444
Technicians	345	229
STS Personnel	608	447
Females		
Total	1442	986
Researchers	684	450
Technicians	290	177
STS Personnel	468	359

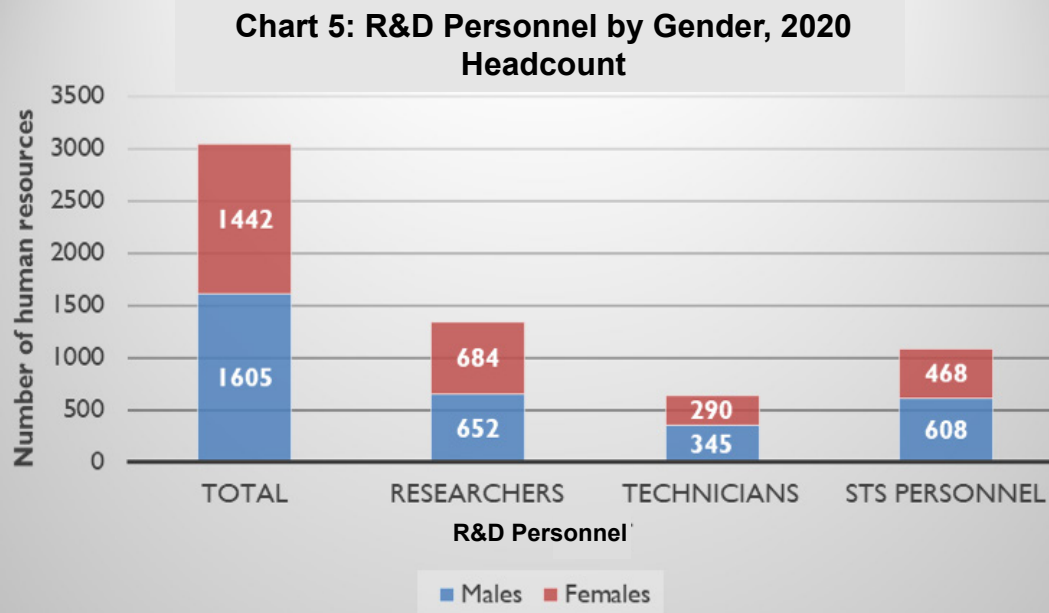


Chart 5 depicts, overall, 1605 (53%) of the R&D Personnel (Headcount) were males and 1442 (47%) were females.

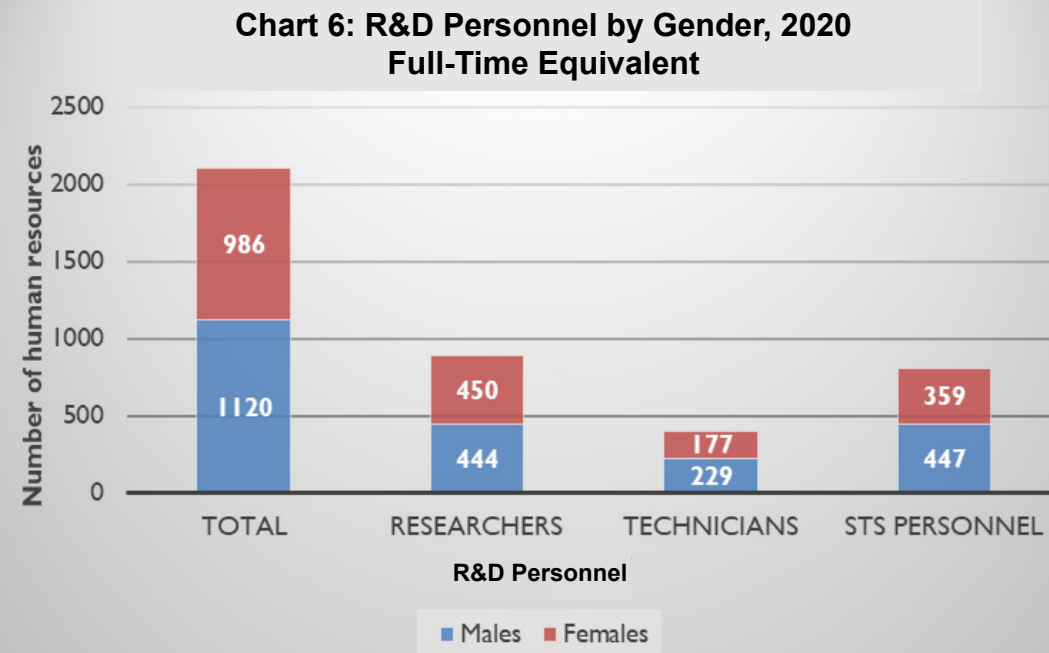


Chart 6 represents that in terms of Full-Time Equivalent (FTE), 1120 or 53% of the R&D Personnel were males and 986 or 47% were females.

Scientific and Technological Services (STS)

Table 3: STS Expenditure, 2016 – 2020

Year	Total expenditure on STS \$TTM
2016	199.67
2017	195.5
2018	204.14
2019	172.41
2020	187.41

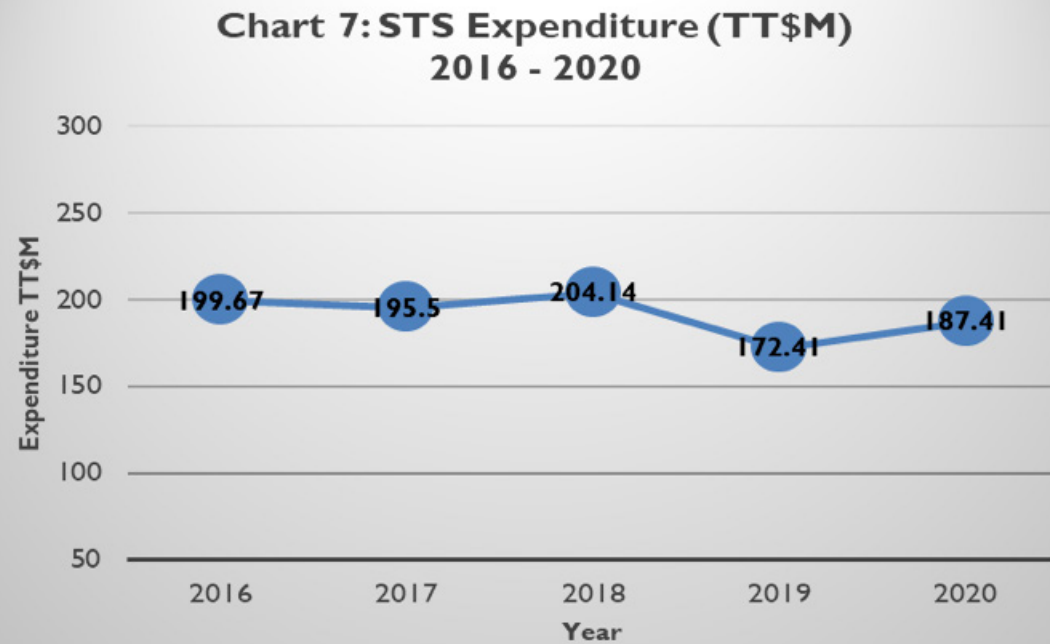


Chart 7 illustrates, STS Expenditure increased from \$172.41M in 2019 to \$187.41M in 2020. STS expenditure averaged \$191.83M over the 5-year period.

Patents Applications

Table 4: Number of Patent Applications by Residents and Non-Residents, 2018 - 2021

Applications	2018	2019	2020	2021
Total	142	118	115	150
Residents	2	1	1	1
Non-Residents	140	117	114	149

Source: Intellectual Property Office

**Table 5: Number of Patent Applications Granted by Residents and Non-Residents
2018 - 2021**

Number of applications granted	2018	2019	2020	2021
Total	56	68	66	40
Residents	1	1	1	0
Non-Residents	55	67	65	40

Source: Intellectual Property Office

Chart 8: Number of Patent Applications by Residents and Non-Residents, 2018 - 2021

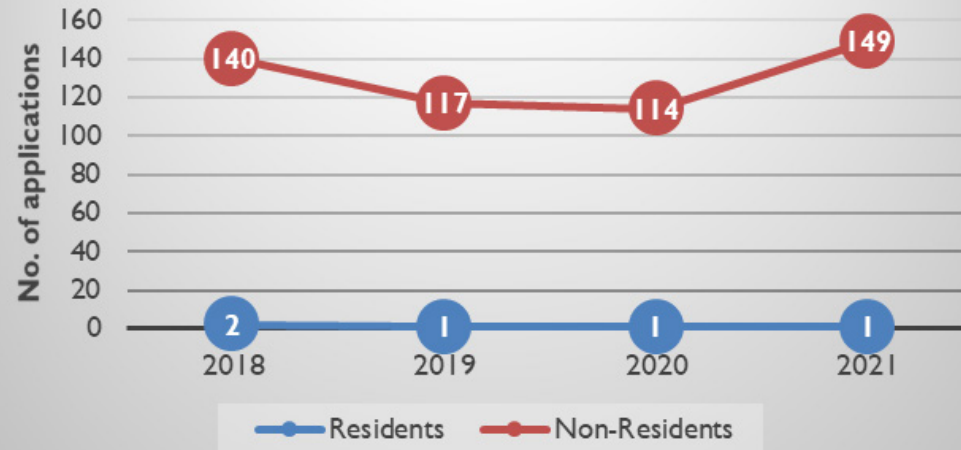
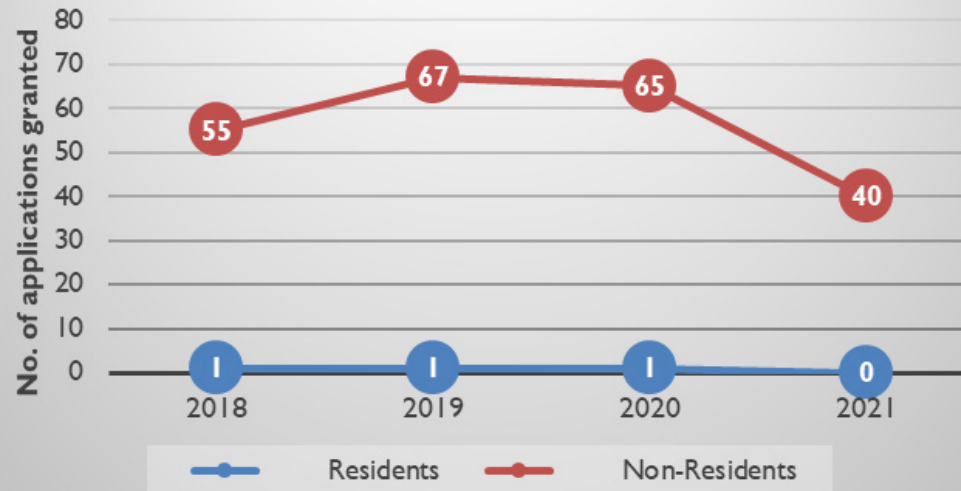


Chart 9: Number of Patent Applications Granted by Residents and Non-Residents 2018 - 2021



Charts 8 and 9 show that between 2018 and 2021 the significant majority of patents filed were by non-residents (Chart 8). Similarly almost all of the patents granted were to non-residents (Chart 9).

Graduate Output

**Table 6: University Graduates by Qualification and Gender, 2021
(State Institutions)**

Qualification	2021		
	Total	Male	Female
Total Graduates	3626	1153	2473
Science and Technology	615	264	351
Engineering	349	228	121
Medical Sciences	638	146	492
Food and Agriculture	164	54	110
Social Sciences	1301	332	969
Education and Humanities	437	88	349
Law	122	41	81
First Degree (Undergraduates)	2884	911	1973
Science and Technology	520	220	300
Engineering	222	159	63
Medical Sciences	577	124	453
Food and Agriculture	150	51	99
Social Sciences	959	245	714
Education and Humanities	334	71	263
Law	122	41	81

Qualification	2021		
	Total	Male	Female
Master's	717	236	481
Science and Technology	90	41	49
Engineering	124	69	55
Medical Sciences	60	22	38
Food and Agriculture	12	3	9
Social Sciences	332	84	248
Education and Humanities	99	17	82
PhD	25	6	19
Science and Technology	5	3	2
Engineering	3	0	3
Medical Sciences	1	0	1
Food and Agriculture	2	0	2
Social Sciences	10	3	7
Education and Humanities	4	0	4

Source: The University of the West Indies, St. Augustine Campus (UWI)
The University of Trinidad and Tobago (UTT)
College of Science, Technology & Applied Arts of Trinidad and Tobago (COSTAATT)

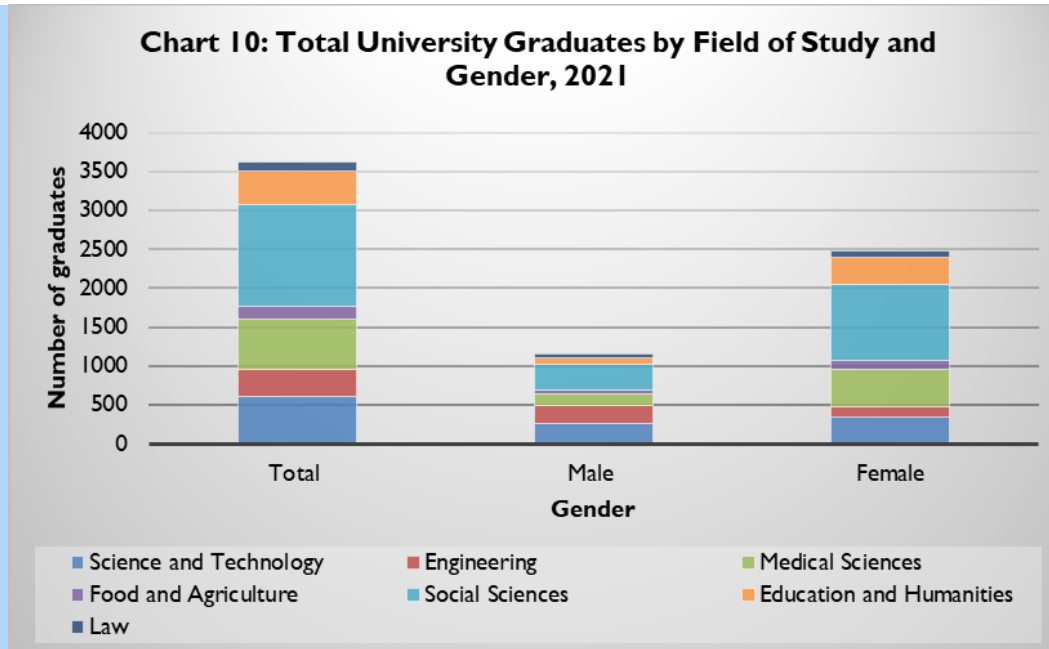


Chart 10 shows that the highest number of graduates (1301 or 36%) were in Social Sciences followed by Medical Sciences (638 or 18%) and Science and Technology (615 or 17%). By gender, females significantly out-numbered their male counterparts in all faculties except Engineering.

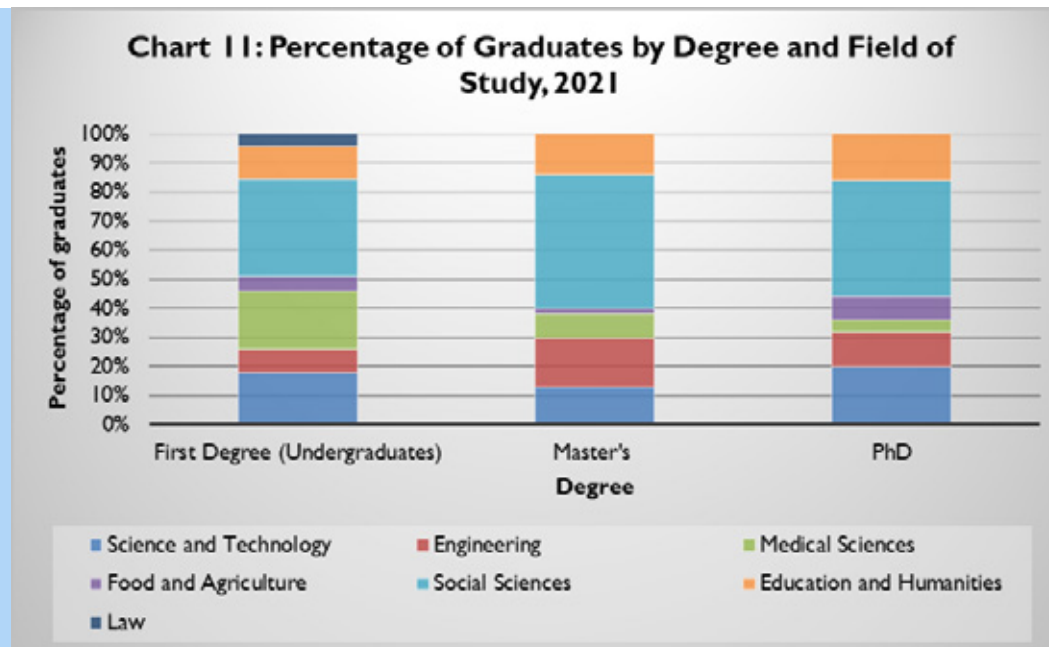


Chart 11 shows that the field of Social Sciences recorded the largest percentage of graduates across all degree levels.

Chart 12: Percentage of STEM Graduates and Non-STEM Graduates by Gender, 2021

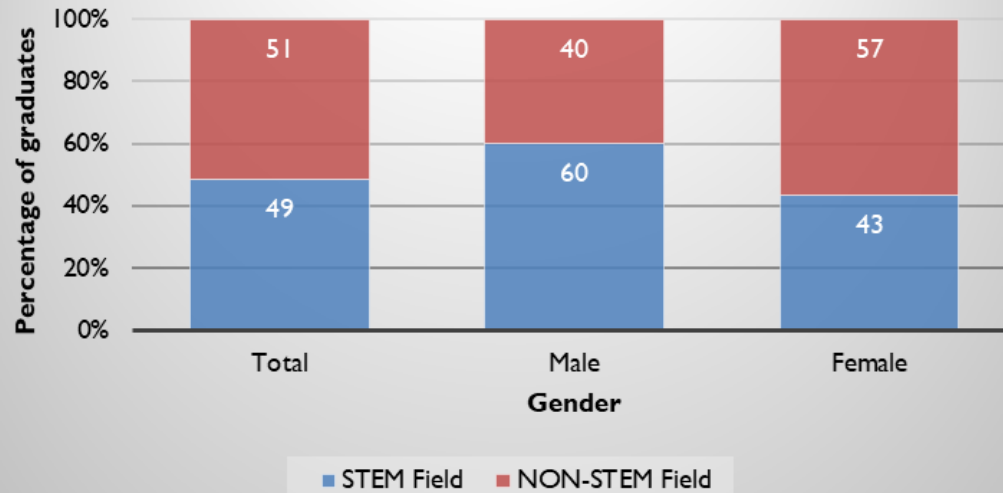


Chart 12 shows that 49% of the graduates were in a STEM field while 51% were non-STEM fields. By gender, a higher percentage (60%) of males graduated in a STEM field compared to females (43%).

Table 7: University Graduates by Qualification and Gender, 2017 – 2021 (State Institutions)

Gender	2017	2018	2019	2020	2021
Total Graduates	5347	4980	4924	4010	3626
Male	1610	1555	1576	1281	1153
Female	3737	3425	3348	2729	2473

Chart 13: University Graduates by Gender 2017 - 2021

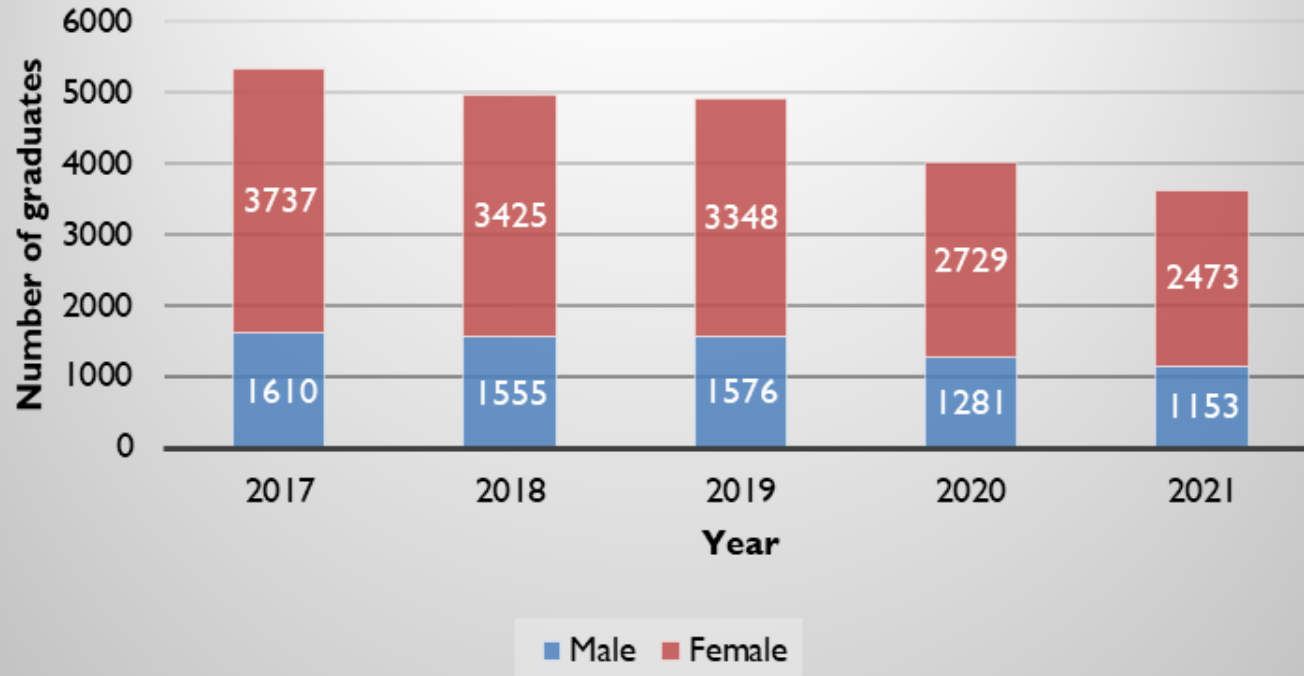


Chart 13 shows that over the period 2017 - 2021 university graduates declined by 32% from 5347 in 2017 to 3626 in 2021. By gender, male graduates declined by 28% while their female counterparts fell by 34% over the same period.



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