

# The Department of Science and Innovation's National Youth Service Programme: Workplace Experience for Unemployed Science Graduates

2020 Technical Report



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## Acronyms

DSI	Department of Science and Innovation
DST	Department of Science and Technology
HDI	Historically Disadvantaged Institution
HSRC	Human Sciences Research Council
NYDA	National Youth Development Agency
NYS	National Youth Service
SAASTA	South African Agency for Science and Technology Advancement
SES	Science Engagement Strategy
STEM	Science, Technology, Engineering and Mathematics
YiSS	Youth into Science Strategy

## Executive summary

The Department of Science and Innovation's National Youth Service is a state-funded programme responding to the phenomenon of unemployed science graduates. The key objective of the programme is to provide work experience and opportunity for community service for unemployed science graduates, facilitating their careers in STEM areas. The programme is built on three dimensions: service, individual development through learning, and meaningful exit opportunities. This technical report provides the findings from surveys conducted with the 2017, 2018 and 2019 cohorts from data collected in 2020. The research questions guiding this report are:

- (i) Who participated in the NYS in 2019?
- (ii) What were the educational-related pathways of the 2019 NYS participants into the work experience programme?
- (iii) What were the experiences of 2019 cohort in the NYS programme?
- (iv) What are the pathways out of the work experience programme for the 2017, 2018 and 2019 respondents?
- (v) What were the volunteer activities that the 2019 respondents undertook?

In keeping with the data showed that those accessing the NYS programme in 2019 were largely African and female. The programme has successfully targeted groups considered 'vulnerable' in terms of these demographic characteristics with regards to the labour market. While the academic performance reported in grade 12 was not outstanding, the study showed that respondents do access and succeed in tertiary education programmes. The qualification profile of NYS 2019 cohort participants was such that: 25% had a diploma, 42 % had a Bachelor's degree and 30% had a postgraduate degree. Participants studied at South African universities, universities of technology, TVET colleges and private tertiary institutions. Participants graduated with qualifications in areas of chemistry, engineering, health sciences, and environmental sciences. The educational profile of these graduates (and the reported shortages of skill in the country) highlights the unemployed STEM graduate phenomenon. Furthermore, that graduates from all major South African institutions participate in the programme indicates that this issue goes beyond whether or not a graduate attends a 'poor performing institution.'

Across the cohorts, respondents accessing the NYS followed four distinct pathways into the programme: (i) respondents who were unemployed (59%), (ii) respondents who were underemployed as they were working part-time or were working in fields not related to STEM (8%), (iii) respondents who proceeded directly from a higher education institution into the programme (30%), and (iv) respondents who were working (2%). We have categorised the last two groups of pathways as "unintended" as the intention of the programme is to provide work experience for those STEM graduates who are experiencing barriers in gaining relevant work experience.

One of the NYS objectives is to improve participants' employability. After participation in the programme 41% had found paid employment with a further 11% of respondents working and studying. Thus, the NYS programme appears to improve employability of over half respondents, with 54% of participants moving into employment. Furthermore, 15% of participants pursued further studies. Of concern is that one in four NYS completers are still unemployed one year after exiting the programme.

Other findings indicate that 73% of respondents indicated that participation in the NYS programme improved their employability in their subject knowledge, with a further 7 % responding that their employability was enhanced, although not related to their subject knowledge. The respondents' ability to work in teams and their interpersonal and STEM related skills were reported to have limited improvement. In terms of the goal of assisting participants in transitioning into STEM related careers, the NYS programme may, therefore, require more of a specific focus on imparting the technical skills required of a STEM work environment.

Eighty percent of the respondents reported being involved in some form of volunteerism. The highest proportion is for tutoring learners or students' indication of some form of give back community service. This suggests that the dimension of inculcating a culture of service is being fostered through the programme.

South Africa experiences both skills shortages and graduate unemployment in STEM areas, where the workplace requires first time employees to demonstrate work experience. Programmes like the state-funded NYS are important in bridging the divide between graduates and the workplace. The NYS promotes mechanisms which allow the most disadvantaged groups – with the least social capital – access to labour market networks to gain this experience and thereafter access the appropriate job opportunities. This state funded subsidy is a mechanism towards promoting equity within the labour market.

## 1. Introduction

In South Africa, despite the drive to produce more science graduates, some of these graduates face the challenge of being unable to find employment as they attempt to enter the labour market. This is often as a result of graduates lacking the workplace experience that prospective employers seek.

In response to this problem, national government policy<sup>1</sup> in South Africa mandates the development of a National Youth Service (NYS) within each government department. This provides long-term and effective ways of reconstructing South African society by developing the abilities of young people through service and learning (RSA, 2003). These capacity building opportunities for youth in the country are facilitated through the National Youth Development Agency (NYDA). The NYS model incorporates three dimensions: service, individual development through learning, and meaningful exit opportunities. Each of these elements need to be seen as part of an integrated whole – each element builds upon and feeds into the other elements. The model is based on the idea that young people require interventions that address the personal, social, and economic aspects of their lives in a holistic manner.

The Department of Science and Technology (now called the Department of Science and Innovation (DSI)) developed its version of the NYS programme in 2007 and incorporated it firstly within the Youth into Science Strategy (YISS) and later the Science Engagement Strategy (SES). Amid concerns about the numbers of unemployed science graduates in the country, the DST (now DSI) embarked on the programme to provide workplace experiences to unemployed and underemployed Science, Technology, Engineering and Mathematics (STEM) graduates. The NYS programme, therefore, has a critical role to play in the country through building STEM capacity, both at the individual and the institutional level.

The NYS programme provides work placement for unemployed science graduates at science centres, schools and other public and private science promotion organisations across South Africa. By doing so, the DSI aimed to retain these graduates within STEM related occupations, as well as provide resources to the institutions that host these graduates. In doing so, the NYS programme should contribute to achieving the goals set out in the National Development Plan to contribute to enhancing the STEM human capital of the country (NPC, 2012). As part of the programme, participants gain work experience related to science awareness, provide a service to the community and have the opportunity to attend additional training related to their work<sup>2</sup>. A stipend is paid to participants to cover costs incurred by their participation.

### 1.1 Purpose of this report

Since 2012, the HSRC has conducted an annual tracking study of the NYS programme participants where participants are contacted the year of entering the NYS programme and then for two subsequent years. This technical report provides the findings of the tracking of the 2017, 2018 and

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<sup>1</sup> The National Youth Service Policy Framework (2003). National Youth Commission. Government printer, Pretoria.

<sup>2</sup> NYS participants hosted by science centres may have the opportunity to attend training provided through the DSI's Science Centre Capacity Building Project (Hannan *et al.*, 2018).



2019 cohorts. This data collection was conducted in 2020. Guiding this report are five key research questions:

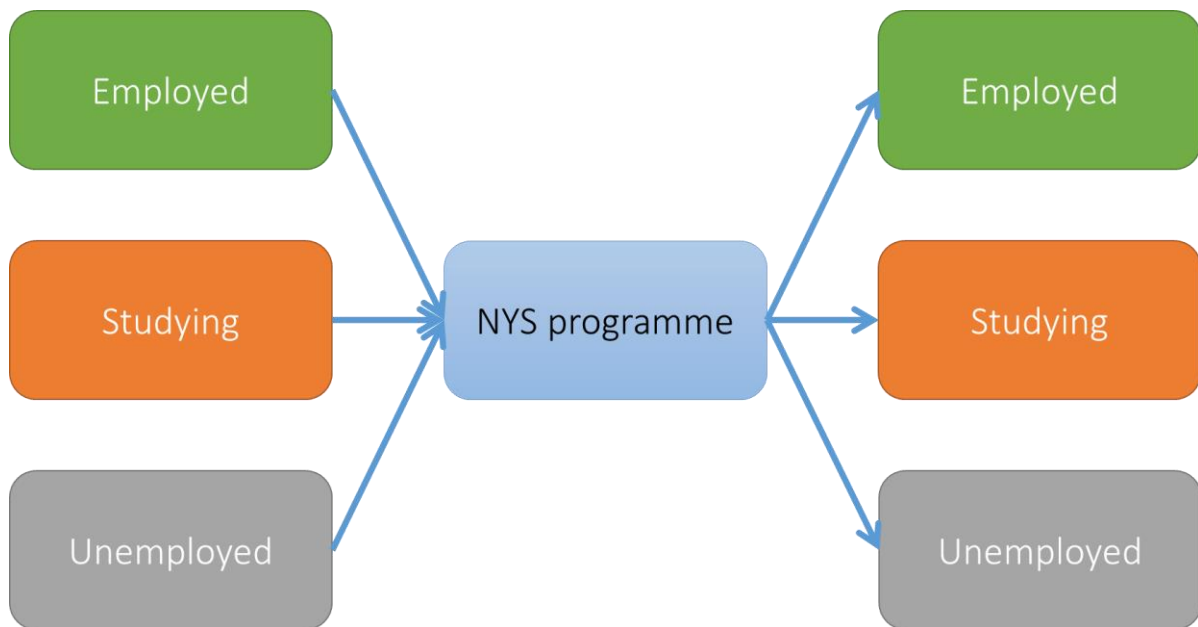
- (vi) Who participated in the NYS in 2019?
- (vii) What were the educational-related pathways of the 2019 NYS participants into the work experience programme?
- (viii) What were the experiences of 2019 cohort in the NYS programme?
- (ix) What are the pathways out of the work experience programme for the 2017, 2018 and 2019 respondents?
- (x) What were the volunteer activities that the 2019 respondents undertook?

As this is a technical report, we set out the findings from the data collected in 2020.<sup>3</sup> For a comprehensive evaluation of the DSI's NYS we invite the reader to refer to the 10 Year commemorative report.<sup>4</sup>

## 1.2 Methodology

The study used a pathways framework (Figure 1), collecting information on participants' educational and labour market transitions and outcomes. This framework allowed for the detailing of participants' transitions between studying, working and unemployment. This report describes how participants' pathways converge into the NYS programme and then, after participation, diverge into further studies, employment, or unemployment.

**Figure 1: Pathways framework**

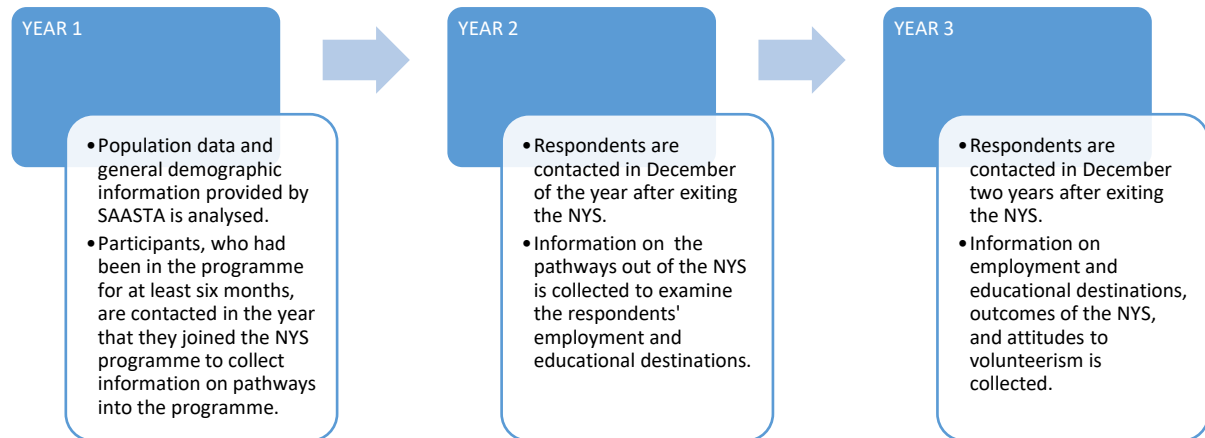


<sup>3</sup> This is Year 1 data for the 2019 cohort, Year 2 data for the 2018 and Year 3 data for the 2017 cohort.

<sup>4</sup> Juan, A., Hannan, S., Zulu, N. and Reddy, V. 2018. *The DST National Youth Service: Work experience for unemployed science graduates. 10-year commemorative report (2007- 2017)*. Report to the Department of Science and Technology. Pretoria: Human Sciences Research Council.

The HSRC contacted the participants in the year of entry into the NYS programme and then again in two subsequent years. In order to give the participants sufficient time to experience the NYS programme, we only contacted those participants who had been in the programme for at least six months. The South African Agency for the Advancement of Science and Technology (SAASTA) provided the HSRC with a database of participants for the period in question. Participants were tracked annually from the year that they entered the NYS until two years after exiting the programme. The tracking plan for each year's cohort is shown in Figure 2.

**Figure 2: Tracking plan for each cohort**



**Data**

The 2019 NYS programme contact database included information about the 177 participants: their race, gender, age, and qualifications. The contact database included telephone numbers as well as email addresses of the participants. Participants were contacted through a call centre and the survey was administered telephonically. Participants were tracked for two years subsequent to entering the NYS. Table 1 sets out the number of participants for each year, and the numbers tracked in the subsequent years. The highlighted cells (in green) indicate the data that was used for this technical report.

**Table 1: Tracking and data collection information**

Cohort (period of entry into the NYS)	Participants (Population Database)	Respondents Contacted in Year of NYS Entry (Year 1)	Respondents Contacted a Year after Exiting NYS (Year 2)	Respondents Contacted Two Years after Exiting NYS (Year 3)
2017 (1 August 2016-31 July 2017)	188	103	83	46
2018 (1 August 2017-31 July 2018)	182	112	66	Data to be collected in 2021
2019 (1 August 2018-31 July 2019)	177	96	Data to be collected in 2021	Data to be collected in 2022

From Table 1, we see that the 2019 Year 1 response rate was 54%. The frequencies of the key demographic characteristics were analysed to ensure that the respondents generally fit the profile of the participants. The 2019 respondents of respondents exhibited the following demographics: 97% Black African, 64% female and average age of 27 years. As evident in Section 2.1, this is very similar to the demographics of the 2019 full population of participants. We are thus able to make inferences from the respondents' data with some degree of certainty. Due to the high levels of attrition (which is expected in a tracer study) Years 2 and 3, for the 2017 and 2018 cohorts, we can only present findings for those participants who responded to the survey and not make generalisations about the cohorts respectively.

### 1.3 Signposting for the rest of the report

In Sections 2 and 3 of this report, we look at the participants of the NYS programme, their demographics, and educational or labour market status prior to entering the programme. In Section 4, we document the respondents' NYS programme journey from discovering the programme to being placed at institutions and describe the experiences of the respondents in the NYS programme workplace. Section 5 looks at respondents' experiences and career trajectories after exiting the NYS programme. Section 6 looks at volunteer activities that the participants have undertaken. Section 7 provides concluding comments.

## 2. Demographic and Educational background of 2019 participants

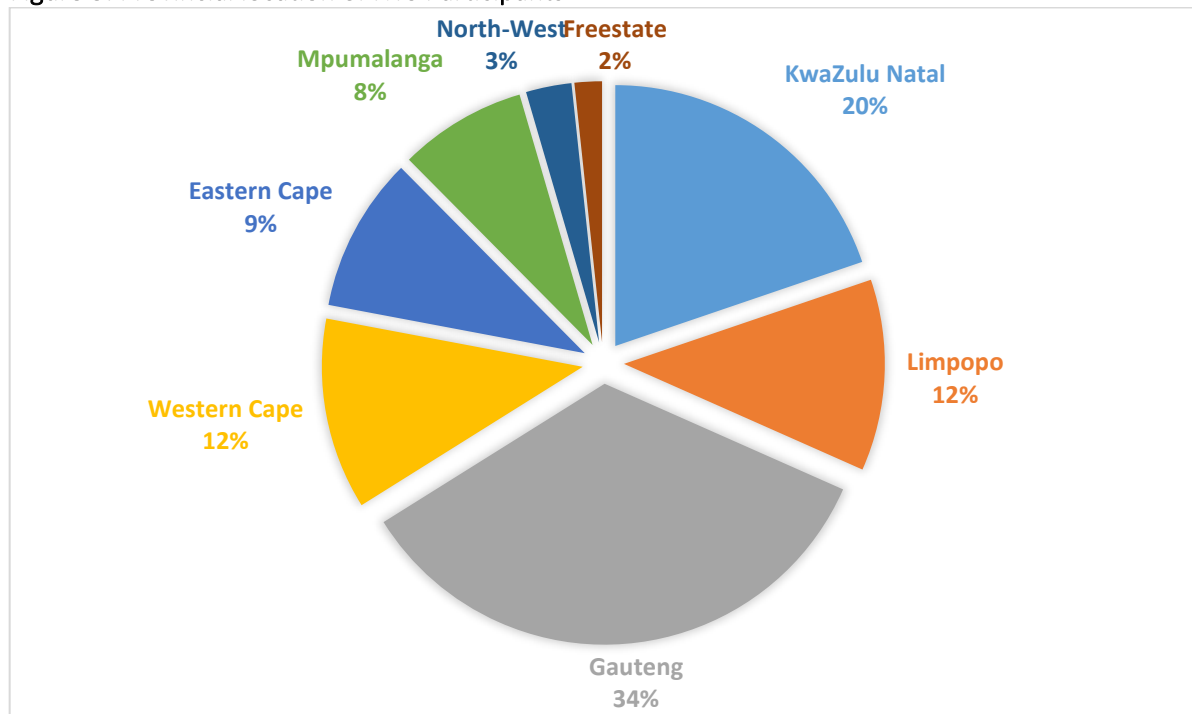
This section describes the demographic and educational backgrounds of the participants to the National Youth Service (NYS) program.

### 2.1 Who participated in the NYS in 2019?

The average age of the participants within the contact database was 27 years with a standard deviation of 2.3, ranging from 23 to 34 years. Fifty-eight (58) percent of the participants were female and the remaining 42% male. Ninety-seven (97) percent of the participants were African, 2% Coloured and 0.5% White. Figure 3 shows in which provinces the participants were living. There is an uneven distribution

in the numbers of participants with three provinces, Gauteng (34%), KwaZulu-Natal (20%) and Limpopo (12%) making up just over two third of the participants.

**Figure 3: Provincial location of NYS Participants**



Source: Contact database

## 2.2 Grade 12 Participation and Performance

Table 2 shows that approximately less than a quarter of the respondents completed grade 12 before 2009, implying that these respondents experienced 10 years or more between completing high school and participation in the NYS. This lengthy duration could indicate potential for a non-linear transition from schooling, to university and then to work. Comment cannot be made, however on post-schooling activities prior to 2009.

**Table 2: Year in which respondents completed grade 12 (Cohort 2019, N=96)**

Year	Frequency (N)	Percent %
2015	2	2
2014	3	3
2013	18	19
2012	11	12
2011	20	21
2010	9	9
2009	11	12
Before 2009	22	23
Total	96	100

Source: Year 1 survey database

Table 3 below describes mathematics, physical science, and biology participation in grade 12.<sup>5</sup> From these responses we see that a majority of the respondents took Mathematics and Physical Science .

**Table 3: Participation in mathematics, biology and physical science in grade 12 (Cohort 2019, N=96)**

Subject	Frequency (N)	Percent (%)
Mathematics	93	97
Physical Science	89	93
Biology	16	17

Source: Year 1 survey database

Tables 4 below describes performance of the NYS participants in the STEM subjects. For each subject, the symbols with the largest proportion of respondents are highlighted in green.

**Table 4: Grade 12 Performance in physical science and mathematics (Cohort 2019, N=96)**

Performance: Symbol (%)	Physical science (%)	Mathematics (%)
A (80-100%)	1	5
B (70-79%)	12	15
C (60-69%)	23	21
D (50-59%)	32	31
E (40-49%)	14	14
F (30-39%)	10	9
G (0-29%)	1	2
Missing	7	3

Source: Year 1 survey database

The participants all attained passes in grade 12, which were high enough to access tertiary qualifications, with 40% scoring above 60% in both subjects.

### 2.3 Tertiary academic profile of 2019 NYS participants

This section looks at the academic profile of the NYS participants such as the tertiary institution they attended and degree qualification. The profile of educational qualifications of participants is as follows:

- 25% (24) of participants hold diplomas
- 42% (40) hold Bachelor's degrees
- 25 % (24) hold postgraduate honours degrees, and
- 5 % (3) hold Master's degrees

It is disconcerting that close to a third (30 %) of the NYS participants hold a qualification higher than a Bachelor's degree and yet are accessing the NYS programme rather than employment.

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<sup>5</sup> The survey did ask about the type of pass that the respondents achieved (i.e. distinction, Bachelor, and diploma). However, this question was not answered well, and the data was not used.

Tables 5 and 6 describes the highest qualification of the NYS participants, when they entered the NYS programme, by race-and gender. National statistics<sup>6</sup> indicate that African females are the most vulnerable demographic in the labour market. The over-representation of African females in this cohort supports such findings that suggest that they have the most difficulty finding a job that is commensurate with their qualification.

**Table 5: Qualification of participants by race (Cohort 2019, N=177)**

Race	Qualification level					Total
	National Diploma	Bachelor	Honours	Masters	Missing	
African	42	70	29	6	16	163
Coloured	3	5	2	-	1	11
Asian	-	-	1	-	-	1
White	-	-	1	1	-	2
Total	45	75	33	7	17	177

Source: Contact database

**Table 6: Qualification level of participants by gender (Cohort 2019, N=177)**

Gender	Qualification level					Total
	National Diploma	Bachelor	Honours	Masters	Missing	
Female	28	49	14	2	8	101
Male	17	26	19	5	9	76
Total	45	75	33	7	17	177

Source: Contact database

Respondents studied at many of the country's tertiary institutions with the largest group having studied at universities (Table 7). This is in contrast to the popular discourse that it is generally graduates from Historically Disadvantaged Institutions (HDIs) who cannot find jobs. Table 7 shows that it does not seem to be the case for this cohort as 24 participants are from HDIs while the others attended higher ranked universities.

**Table 7: Tertiary institution attended (Cohort 2019, N=96,)**

Type of Institution	Institution	Frequency (N)	Frequency by inst. type
University	North West University	4	72
	Rhodes University	2	
	University of the Witwatersrand	1	
	Nelson Mandela University	2	
	University of Free State	3	
	University of Western Cape	2	

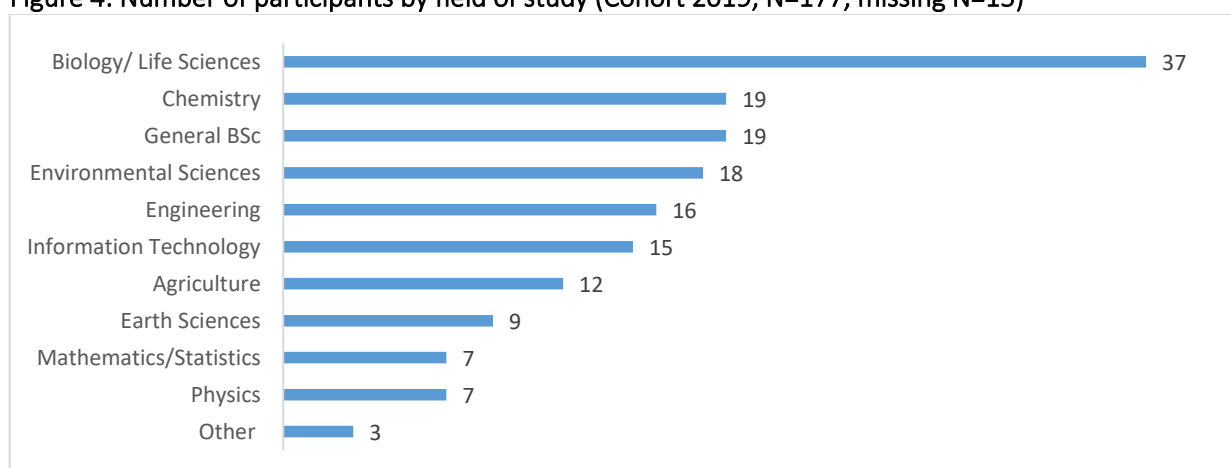
<sup>6</sup> Statistics South Africa Quarterly Labour Force Survey Q2, 2018

	Walter Sisulu University	2	
	University of Fort Hare	6	
	University of Venda	7	
	University of Zululand	2	
	UNISA	4	
	University of KwaZulu-Natal	9	
	University of Pretoria	3	
	University of Johannesburg	8	
	University of Stellenbosch	3	
	Sefako Makgatho	1	
	University of Limpopo	13	
University of Technology	Cape Peninsula University of Technology	2	18
	Mangosuthu University of Technology	4	
	Vaal University of Technology	2	
	Tshwane University of Technology	10	
Private institution	Richfield college, Jeppe College, Sensor City College	5	5
Missing		1	1
<b>Total</b>		<b>96</b>	<b>96</b>

Source: Year 1 survey database

The field of study is an important factor in the discussion of NYS participants. This is so since it may be that preference is given to a particular field by an employer or graduate which either increases or decreases the likelihood of easy transition into employment, and thus participants' wishes to access the NYS programme. Figure 4 sets out the number of participants by aggregated field of study. The highest number of participants studied Biology or life science. The 2020 Occupations in High Demand list<sup>7</sup> indicates that the fields of study of the NYS participants are areas where there are skills shortages in the country. This points to other factors at play in the labour market that prevent these participants from entering.

**Figure 4: Number of participants by field of study (Cohort 2019, N=177, missing N=15)**



Source: Contact database

<sup>7</sup> Government Gazette No. 43937

Respondents were asked why they chose to study STEM subjects and modules. Most participants (78.1%) indicated that they were interested, whilst the rest had varying reasons as indicated on the table 8 below. Thus, more than two-third reported a genuine interest in studying and working in this area.

**Table 8: Reasons for choosing STEM subjects (Cohort 2018, N=96)**

Reasons	Frequency (N)	Percent (%)
Employment gain	3	3
Formal qualification gain	1	1
Prestige	3	3
Skills improvement	9	9
To prepare for work in a sector with scarce skills	5	5
Interest	75	78
Total	96	100.0

Source: Year 1 survey database

The main reason indicated for following a science study route was out of interest and to improve the skills base as well as prepare for work in a scarce sector. Respondents recognise the shortage of skills in the science sector and thus it must be a surprise that they are unable to gain employment.

### 3. Pathways of NYS Participants before entering into the NYS Programme

In this section we will discuss the pathways and transitions into the NYS programme including their career intentions when at high school, and their job search efforts before entering the NYS.

Across the cohorts, respondents accessing the NYS followed four distinct pathways into the programme: (i) respondents who were unemployed, (ii) respondents who were underemployed as they were working part-time or were working in fields not related to STEM, (iii) respondents who proceeded directly from a higher education institution into the programme, and (iv) respondents who were working. We have categorised the last two groups of pathways as “unintended” as the intention of the programme is to provide work experience for those STEM graduates who are experiencing barriers in gaining relevant work experience. Table 9 illustrates the proportion of respondents falling into each category.

**Table 9: Labour market status immediately before entering the NYS programme (Cohort 2019, N=96)**

Employment status	Frequency (N)	Percent (%)
Unemployed	57	59
I was working in a field not related to my studies.	8	8
I was studying and searching for work	29	30
Working	2	2
Total	96	100

Source: Year 1 survey database



It is important to also take into consideration when the respondents passed grade 12 (Table 2) – 22% of the respondents took 10 or more years from grade 12 to entering the NYS programme. The majority of respondents were involved in a number of other activities, experiencing interrupted work and educational pathways into the programme.

Participants were asked why they applied for the NYS programme. Table 10 indicates below that the majority (57.3%) needed work experience, whilst others had varying reasons such as needing income and not finding any other work in their field of study.

**Table 10: Reasons for joining NYS (Cohort 2018, N=96)**

Reason	Frequency (N)	Percent (%)
I needed work experience	55	57.3
Volunteering was an opportunity for me to give back	15	15.6
I needed the income	6	6.3
I could not find any other work in my area of study	9	9.4
The income helped support me while I studied	3	3.1
Other	8	8.3
Total	96	100.0

Source: Year 1 survey database

The finding from Table 10 tie into one of the aims of the NYS – to provide work experience for science graduates. The second highest (15.6%) reported reason was that the NYS programme was an opportunity to give back highlighting the service dimension of the programme.

#### 4. NYS programme placement

In this section we discuss the placement of the 2019 cohort participants and the experiences of the respondents in the host institutions.

The 2019 participants were placed at 47 different host institutions across the country. These institutions have included: science centres, schools, observatories, zoos and research councils. There is a mix of public and private host institutions. The stipend that the participants received varied according to their qualification level, ranging from R4 500 for those with a Diploma to R6 500 for those with a Masters degree. Table 11 sets out the names of those institutions and the number of participants that were placed in each.

**Table 11: NYS programme participant placement (Cohort 2019, N=177)**

Host institution	Number of participants
South African Agency for Science and Technology Advancement	19
Department of Basic Education (schools)	17
Cape Town Science Centre	10
Mathematics Science and Technology Academy	10
South African National Biodiversity Institute	10

ArcelorMittal Science Centre – Saldanha	6
Mondi Group	6
Thandela Consulting	6
Agricultural Research Council	6
Kwa-Zulu Natal Science Centre	5
Fort Hare School of Science and Technology Discovery Centre	5
Sci-Enza	5
Anglo-American Science Centre	4
Brickplay	4
National Zoological Garden	4
UniZulu Science Centre	4
Bokamoso Science and Technology Education Centre	3
Giyani Science Centre	3
Moipone Academy Science Centre	3
North West University-Potchefstroom	3
South African Radio Astronomy Observatory	3
University of Johannesburg (Soweto Science Centre)	3
University of Limpopo Science Centre	3
University of Venda (Vuwani Science Resource Centre)	3
University of the Western Cape Science Learning Centre for Africa	3
Unemployed Graduates in Science (Pty) (Ltd)	3
Izingolweni Education Resource Centre	2
Mothibastad Science Centre	2
Penreach Shalamuka Science Centre	2
Reuben Dlamini Foundation	2
Yazi Centre for Science & Society in Africa	2
Osizweni Science Centre	2
South African Mathematics Foundation	2
Nelson Mandela Bay Science & Technology Centre	2
Stellenbosch University	2
Academy of Science of South Africa	1
National Science and Technology Forum	1
Palabora Foundation	1
Red PENCIL Group	1
IThemba Labs	1
Mintek	1
Nuclear Energy Corporation of South Africa	1
South Africa's National Science Festival Africa	1
South African National Space Agency	1
UKZN Science and Technology Education Centre	1
University of Fort Hare - FOSST Discovery Centre	1
<b>Total</b>	<b>177</b>

Source: Contact database

Participants undergo formal workshop or capacity development to enhance their skills sets. Table 12 sets out the numbers of those who attended training and those who found the training useful. More than three-quarters of all who attended the different types of trainings found it useful.

**Table 12: Respondents who attended training and who found it useful (Cohort 2019, N=96)**

Training	Attended training	Found it useful	% of those found the training useful
Project management	33	25	76
Presentation Skills	47	43	92
Events management	26	22	85
Facilitation skills	41	32	78
Life Skills	71	62	87
Leadership skills	45	40	89
Computer skills (Basic)	28	25	89

Source: Year 1 survey database

Respondents indicated that a number of their skills were enhanced through their participation in the NYS programme (Table 13). The main skills that respondents had gained were technical skills and the ability work in teams. The NYS programme thus succeeded in providing the participants with the opportunity to experience a workplace and understand the dynamics of workplace interactions.

**Table 13: Most important skill gained through the NYS programme (Self-reported) (Cohort 2019 N=96)**

Type of Skills	Frequency (N)	Percent (%)
Technical skills (including STEM skills)	62	65
Ability to work in teams	21	21,9
Interpersonal skills	6	6,3
Ability to manage more responsibility	4	4,2
Ability to communicate science to others	3	3,1
Total	96	100.0

Source: Year 1 survey database

Interpersonal skills, ability to manage more responsibility, ability to communicate science to others and STEM related skills were perceived to have limited improvement. In terms of the goal of assisting participants in transitioning into STEM related careers, the NYS programme may, therefore, require more of a specific focus on imparting STEM skills in the work environment. Regardless of this, 72.9% of respondents indicated that participation in the NYS programme improved their employability, with a further 7.3 % responding that their employability was enhanced, though not related to their subject knowledge (Table 14).

**Table 14: NYS outcomes in terms of increasing employability (Cohort 2019, N=96)**

Response to whether the NYS increase employability	Frequency (N)	Percent (%)
Yes	70	72.9
Yes, but not to jobs related to qualification	7	7.3
No	5	5.2
Not sure	14	14.6
Total	96	100.0

Source: Year 1 survey database

## 5. Pathways out of the NYS

In this section we detail the pathways of the respondents from the 2017, 2018 and 2019 cohorts out of the NYS programme. Attention is paid to the labour market trajectories of the respondents.

Participants were asked to indicate their current activity, Table 15 indicates that largest proportion of 2019 cohort respondents (30%) were still in the NYS programme, whilst the second largest percentage of the participants were unemployed (24%).

**Table 15: Current activity of NYS participants**

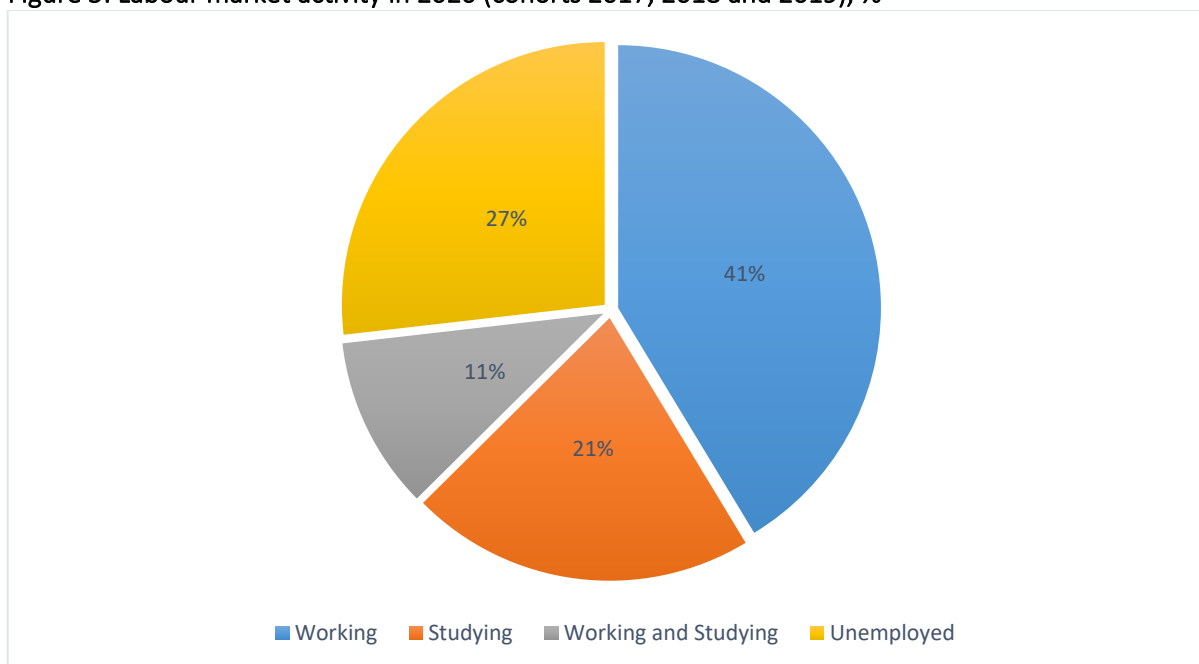
Current activity	2 years after exiting (2017 cohort) Tracker 2		1 year after exiting (2018 cohort) Tracker 1		Year of entry (2019 cohort)	
	Frequency (N)	Percent (%)	Frequency (N)	Percent (%)	Frequency (N)	Percent (%)
Working	25	54	29	44	20	21
Working and studying	8	17	4	6	7	7
Studying	7	15	14	21	17	18
Unemployed	6	13	19	29	23	24
Still in the NYS programme <sup>8</sup>	0	0	0	0	29	30
Total	46	100	66	100	96	100

Source: Years 1, 2 and 3 survey databases

Figure 5 illustrates the activity of all the respondents from the three cohorts at the time of data collection. Over half of the respondents were in paid employment (41% working and 11% working and studying) with a further 21% of respondents studying. Of concern is that 27% NYS completers were unemployed, two and three years after completing NYS.

<sup>8</sup> These participants had not exited the NYS yet.

Figure 5: Labour market activity in 2020 (cohorts 2017, 2018 and 2019), %



Source: Years 1, 2 and 3 survey databases

Table 16 sets out the sectors and types of organisations that the respondents were working in. The largest proportions are highlighted. Most of the respondents indicated that they were working in the educational sector, environmental sciences and other and most of the respondents were working for private companies and government funded organizations. It is promising that the respondents have found jobs in a range of sectors and types of organisations.

Table 16: Sector of employment (Cohorts 2017, 2018 and 2019) post NYS

Sector	Frequency (N)	Percent (%)
Computer Sciences	2	3%
Education	17	23%
Engineering	10	14%
Environmental Sciences	7	9%
Health Sciences	7	9%
Mathematics & Statistics	1	1%
Natural Sciences	2	3%
Other (Commerce, finance, administration, social sciences, retail, etc.)	22	30%
Science communication	6	8%
<b>Type of organisation</b>		
Parastatal	3	4%
Government funded organisation	12	16%
National/provincial/local government	4	5%
Non-profit (NGO/CBO)	7	9%
Private company	36	49%
School	6	8%

Science Centre	3	4%
University	2	3%
Other	1	1%

Source: Years 1, 2 and 3 survey databases

For those participants who were working were asked about their earning band. Unfortunately, most respondents preferred not to disclose this information.

The participants who were tracked 1 and 2 years after exiting the NYS programme were asked about their quality of work with specific reference to whether the respondents found their work dignified and fulfilling. Table 17 sets out the number of respondents who have indicated high levels of agreement with the statements.

**Table 17: Respondents who reported high levels of dignified and fulfilling work (Cohorts 2017 and 2018) (N=74)**

Work status	Frequency (N)	Percent (%)
Good working conditions	26	35%
Job is in line with studies in STEM	33	45%
Job is in line with intended career path	33	45%
Opportunities for workplace training	26	35%
High level of job satisfaction	25	34%
High level of work experience	30	41%
High rank in organisation	16	22%

Source: Years 2 and 3 survey databases

The percentages of respondents reporting high levels dignified and fulfilling work was low. It is not unexpected that fewer respondents felt that they had high ranking in their respective organisation as these are entry jobs.

## 6. Volunteerism

As mentioned in the introduction, one of the aims of the NYS programme is to inculcate a spirit of service or volunteerism in the participants. Since 2013, the respondents have been asked about their attitudes to volunteerism to assess whether the programme is achieving this aim. The statements to which the respondents were:

- It is important to me to have a sense of contribution and helpfulness through participating in community service.
- Contributing my skills through the National Youth Service has made the community a better place.
- I will participate in a community service project in the next year.
- I will seek out an opportunity to do community service in the future.

Over 90% of the respondents agreed strongly or very strongly with these statements. While not the overt intention of this study, the hope is that these questions may stimulate thought and nudge the respondents into pursuing some kind of community volunteer service in future. When respondents were asked what volunteer activities they had participated in, either through the NYS or in their private capacity, some differentiation was exhibited (Table 18).

**Table 18: Number of respondents reporting volunteer activities either in the NYS or privately (Cohort 2019, N=96)**

Volunteer activities	Frequency (N)
Tutored school going learners or tertiary students	80
Hosted science exhibition/shows at previously disadvantaged schools	71
Mentored school going learners or tertiary students	76
Making presentations to the general public	73
Participated in outreach activities specifically for youth marginalised because of disability or gender	51
Took mobile laboratories to remote or rural schools	38
Volunteered at a Non-governmental Organisation or Non-profit Organisation	49
Participated in community forums on issues which affect them	48

Source: Year 1 survey database

Table 18 shows that a large proportion of the respondents reported being involved in some form of volunteerism. The highest proportion is for tutoring learners or students' indication some form of give back community service.

## 7. Key findings from the study

From the discussion set out above, we draw out key findings of the

### Profile of the 2019 participants

- The 177 participants in NYS programme in 2019 were largely African and female. The programme has successfully targeted groups who would have greater obstacles in entering the labour market.
- There was an uneven distribution in the numbers of participants with three provinces, Gauteng, KwaZulu-Natal, and Limpopo making up just over two third of the participants.
- It is disconcerting that over a fifth of the NYS participants hold a qualification higher than a Bachelor's degree and yet are accessing the NYS programme rather than employment

### Pathways into the NYS programme

- Across the cohorts, respondents accessing the NYS followed four distinct pathways into the programme.
- The majority of respondents were unemployed (59%), 8% of respondents were underemployed as they were working part-time or were working in fields not related to STEM, 30% proceeded directly from a higher education institution into the programme and few were working (2%).

### Benefits of the NYS programme

- Over 80% of respondents stated that their employability was enhanced, though some not related to their subject knowledge.
- In terms of the goal of assisting participants in transitioning into STEM related careers, the NYS programme may require more of a specific focus on imparting STEM skills in the work environment.

### Pathways out of the NYS programme

- Over half of the respondents were in paid employment, with a further 21% of respondents studying. Of concern is that over a quarter of the NYS completers were unemployed, two and three years after exiting the NYS.
- Close to half of the respondents were employed in the private sector. This is a changed pattern from previous years where most respondents were employed in the government.

### Volunteer activities of the 2019 respondents

- Eighty percent of the respondents reported being involved in some form of volunteerism (tutoring, mentoring etc.) This suggests that the dimension of inculcating a culture of service is being fostered through the programme.

## **8. Concluding Comments**

South Africa experiences both skills shortages and graduate unemployment in STEM areas, where the workplace requires first time employees to demonstrate work experience. The main reason indicated by the respondents for following a science study route was out of interest and to improve the skills base as well as prepare for work in a scarce sector. Respondents recognise the shortage of skills in the science sector and thus it must be a surprise that they are unable to gain employment. Thus, programmes like the state funded NYS and the placements in public sector institutions are important in bridging the divide between graduates and the workplace. It is promising to see that private sector institutions are joining this endeavour.

The good intentions of the programme are, however, only partially achieved as 38.4% of respondents were not from groups specifically targeted by the programme – those unemployed and underemployed. The NYS does, however, act as a mechanism which allows the most disadvantaged groups – with the least social capital – access to labour market networks to gain this experience and thereafter access the appropriate job opportunities. In doing so, this programme has contributed enhancing the STEM Human Capital in the country. A secondary outcome of the NYS is that, because participants were based at Science Centres and schools, they participated in science communication activities with the goal of creating public awareness of science and fostering a closer relationship between the public and science.