|  |
| --- |
| MEMORANDUM FROM THE PARLIAMENTARY OFFICE |

**NATIONAL ASSEMBLY**

**FOR WRITTEN REPLY**

**QUESTION 914**

**DATE OF PUBLICATION OF INTERNAL QUESTION PAPER: 11/03/2022**

**INTERNAL QUESTION PAPER NO 9 OF 2022**

**Mr S S Zondo (IFP) to ask the Minister of Higher Education, Science and Innovation:**

Whether, with reference to the Fourth Industrial Revolution, the increase of automation, the increased use of robotic components, the urgent need to upskill those whose jobs are in danger of becoming redundant and the many opportunities for the Republic to benefit from the changes 4IR will bring, his department has a plan to focus on skills development to ensure that the young persons are ready for this new world and to ensure that the Republic does not fall further behind on a global scale; if not, why not; if so, what are the relevant details?

**NW1096E**

**REPLY:**

**Departmental plan to ensure that young persons are ready for the new world and the Republic does not fall further on global scale**

On 7 June 2019 the then Minister of Higher Education, Science and Innovation, appointed a

Ministerial Task Team on the Implications of the Fourth Industrial Revolution for Post-School

Education and Training (4IRMTT) (Government Notice No 839 of 2019) to advise on how the Department should respond to the challenges and opportunities posed by the 4IR.

The purpose of the MTT was to investigate the capacity of the PSET system to: contribute to the 4IR; provide / produce skills that are in line with the needs of the 4IR (building capacity for functioning in the 4IR); and embrace the affordances of the 4IR. The MTT Report has since been presented to the Minister of Higher Education, Science and Innovation, currently two departments within the Ministry of Higher Education, Science and Innovation are working together on the implementation of the recommendations arising out of the Ministerial Task Team on Fourth Industrial Revolution for Post-School Education and Training. However, the Department of Higher

Education and Training has been implementing the following **initiatives related to the Fourth Industrial Revolution**:

1. **DHET Partnership with CISCO and HUAWEI** - The DHET has partnered with CISCO and HUAWEI to support, in the updating of existing curriculum to align with industry demands in the digital skills area. Under Cisco agreement, at least 300 lecturers are being trained at all 50 TVET Colleges to upgrade their skills in ICT related NC(V) qualifications; under the Huawei agreement, lecturers at 32 TVET colleges are being trained to support the introduction of subjects such as Routing & Switching, Big Data, Artificial Intelligence, WLAN, and Security and Cloud Computing.
2. **Occupational Programmes aligned to priority sectors of the ERRP** - Colleges are also identifying Occupational Programmes that will be introduced for purposes of aligning to the priority sectors as stipulated in the Economic Reconstruction and Recovery Plan (ERRP) in Partnership with Quality Council for Trades and Occupations (QCTO) and INDLELA. These will be supported through funding from SETAs and/or the National Skills Fund, guided by research undertaken through the Labour Market Intelligence Partnership (LMIP) and Sector Skills Plans (SPPs), which has highlighted the growing demand for digital and ICT skills across a variety of job roles.
3. **Demand led skilling model for the Global Business Services and ICT industries** - With support from the Presidential Employment Stimulus to the tune of R100 million, the National Skills Fund is managing the roll out of a demand led skilling model for the Global Business Services and ICT industries. This initiative is expected to be expanded in future years through insourcing funding from other public and private sector funders.
4. **Approval and accreditation of programmes** - One of the provisions of the ERRP Skills Strategy is to ensure expanded access to short programmes and full qualification required for the economic growth of South Africa. This also demands that quality councils introduce greater flexibility in their approval processes to ensure faster turnaround for timely approval and accreditation of programmes to respond to changes and innovations in ICT related fields, among others.
5. **Expanded university enrolments** - The university enrolment planning process enables institutions to collectively achieve the goals for the system within the context of system parameters and the government’s priorities. The Department has commenced with its midterm review of the approved 2020 – 2025 university enrolment plans, which will cover the 2023 – 2025 academic years. The review will provide a national picture of enrolments, average annual growth, graduates and further information on national imperatives and priorities for all higher education institutions. This process will culminate in a revised Ministerial Statement on Student Enrolment Planning for the period 2023 – 2025 to ensure that the country can achieve its objectives for expanding university enrolments within a sustainable financial framework.

**Sector Education and Training Authorities (SETAs) priority skills related to 4IR:**

Some SETAs, in their Sector Skills Plans (SPPs) have identified Fourth Industrial Revolution occupations as part of their priority skills, such as:

1. **Agriculture Sector Education and Training Authority (AgriSETA)**

1.1 As a key change driver 4IR was utilized as a vehicle to prioritize the following occupations in the sector: Industrial Mechanician, Planning Managers (Manufacturing), Processing Unit Managers, Plant Managers (Manufacturing), Engineering Managers,

Agricultural Engineering Technicians, Agricultural Product Processing Engineering

Technologists, Crop Production Mechanization Engineering Technologists, Environmental Protection Professionals and Conservation Scientists. These occupations are directly linked to 4IR where the integration of various technologies assist farmers in increasing efficiencies. The Occupations listed above form part of AgriSETA’ s priority occupations and are prioritised in the 2022/23 financial year through funding of bursaries, Graduate Placement and Learnerships.

**2. Banking Sector Education and Training Authority (BANKSETA):**

2.1 The SETA developed occupational qualifications on three levels to be registered with the Quality Council for Trades and Occupations to address the growing need for formal qualifications related to Cyber Security.

2.2 The SETA allocated funds to re-skill and or upskill employees whose roles may be impacted by automation, artificial intelligence, and the increased need for data analytics.

2.3 There is dedicated funding allocated to IT related skills and some of the programmes funded include Data Management, Cobit 5 and Analysing Data.

2.4 Programmes for unemployed youth on the Kuyasa Learnership include modules in Microsoft Azure Fundamentals, Designing and Implementing a Data Science Solution on Azure, Microsoft Azure Artificial Intelligence Fundamentals, and Designing and Implementing an Artificial Intelligence Azure Solution.

2.5 A training programme in Cyber Security was implemented and recently the SETA also started to train high school students on skills for the future which include Coding, software programming and data science.

3. **Construction Sector Education and Training Authority (CETA)**

3.1 The SETA in response to changing world and technologies in the context of 4IR revised its Sector Skills Plan (SSP) to address issues of green technologies and 4IR skills including use robotics and drones in the sector. Emerging skills in this regard are highlighted. The SETA is also planning to review its training material across the board to speak to contemporary skills and innovations in line with the 4IR.

4. **The Chemical Industries Education and Training Authority (CHIETA)**

4.1 The impact of 4IR on the chemicals industry is seeing increasing use of Artificial Intelligence (AI), use of computer systems to perform tasks that would require human intelligence and the following are focal areas in CHIETA Strategic and Performance Planning Process and inter alia also focusing on the youth and rural learners.

4.2 The SETA is currently exploring 4IR opportunities and planning to open CHIETA Innovation Hub by 2025. The Innovation Hub would be dedicated to supporting the growth of very early-stage technology-based businesses in the South African chemicals industry. Learning and digitization of skills development through the virtual/simulated coded welding programme. Various new economy 4IR skill demands on the industry to be supported through the CHIETA Annual Performance Plan (APP).

4.3 As part of Research capacity building for students from previously disadvantaged institutions, the SETA funded the Vaal University of Technology to develop master’s students, through the development of a chitosan membrane for electricity production project, which will be utilised to develop fossil batteries for electric cars and capacitate the students with fourth industrial revolution skills. The University will be working with Pet Industrial, using their facilities for membrane Development.

4.4 Infusing the use of virtual reality (VR) and augmented reality (AR) simulated training to extend the reach of CHIETA services and add greater value to learners. Digital training ecosystems.

5. **Energy and Water Sector Education and Training Authority (EWSETA)**

5.1 The 4IR Project(s) currently supported by the SETA and nature of support or objectives of the project: Influence of Emerging Technologies and Artificial Intelligence Skills in the Sector. This Research Project is to ensure that the EWSETA has relevant, up-to date data and information with respect to the influence of emerging technologies and artificial intelligence skills in the energy and water sector; and the 4IR Aquatech Accelerator is a sector specific programme that seeks to fast-track sustainable solutions for Africa’s water-energy-food nexus **c**hallenges, this is a mentorship driven programme that is designed to identify, develop, support, fund, and up-scale a new generation of 4IR enabled solutions.

5.2 The SETA has partnered with MTN in their Annual MTN APPS Award where it will be leading the development of an Energy and Water Education APP which provides young people the opportunity to not only apply their 4IR skills in developing the APP, but also in interacting and using the winning APP.

5.3 In SETA career guidance interventions, the SETA will start to embed 4IR skills and careers within the energy and water sector, into the awareness and communication roadshows for example: drone technology (used widely in the renewable energy sector).

5.4 The Energy and Water Sector Education and Training Authority (EWSETA) has partnered with the 4IR-AquaTech Business Accelerator programme, which aims to capacitate young entrepreneurs with skills through a 6-month mentorship programme designed to identify, develop support, fund and upscale a new generation of 4IR enabled solutions to address the Eastern Cape Province’s pressing food-energy-water nexus challenges. The programme kicked off in June 2021 with a 4IR Aqua-Tech sociotechnical debate and hackathon to focus on the Eastern Cape water crisis.

6. **Education, Training & Development Practices Sector Education Training Authority (ETDPSETA)**

6.1 The ETDP SETA is supporting its Stakeholders, Constituencies, and the Unemployed persons in acquiring skills in 41R. The following are a few of the programmes implemented:

6.1.1 **Unemployed persons**: currently 250 unemployed young people have registered with the university of Johannesburg and Southwest College on digital skills programmes, namely, Artificial Intelligence and Computer Programming.

6.1.2 **41R Research Chair** - the ETDPSETA has partnered with the University of Johannesburg and established a research chair on 41R. The research looked at the processes of programme implementation at identified TVET Colleges, systems, and processes on how to automate TVET systems for effectiveness and incorporation of 41R principles and programmes. The research recommendations were distributed to the TVET colleges for 41R implementation.

6.1.3 **41R Centres of Excellence in TVET Colleges** - 10 TVET Colleges have received financial support to establish 41R mini laboratories and encouraged to work with the relevant industries for the delivery of programmes. Each TVET has been allocated an initial amount of R4m to commence with the project;

6.1.4 **Support for Community Education and Training Colleges** (CETs) - an amount of R5.4 has been set aside to support CETs to establish digital learning platforms to benefit students and lecturers;

6.1.5 **Department of Basic Education** - ETDPSETA has provided financial support to DBE to improve teaching and learning. A TV Channel has been established through this support. Several initiatives are in place to digitise teaching and learning which include training of teachers in coding, robotics and ICT Integration into teaching and learning.

6.1.6 **Provision of Laptops and data to the unemployed young people** - all unemployed beneficiaries that are supported by the ETDPSETA receive a laptop

and data in addition to the stipends- bursaries, internships, cooperatives development and learnerships and skills programmes.

7. **Food & Beverages Manufacturing Sector Education and Training Authority (FOODBEV)**

7.1 FoodBev SETA held a capacitation workshop in February 2022 with the Theme: Expanding Access to Quality Skills Development programmes in the era of the Fourth Industrial Revolution for the Food and Beverages Manufacturing Sector. The aim of the workshop was to capacitate our stakeholders with technological skills needed in the Food and Beverages Manufacturing Sector.

7.2 The SETA is involved in training and upskilling/reskilling of 200 SMEs on the digital world of small businesses in the sector.

7.3 The SETA is funding towards 10 PhD and 40 Masters Research and Innovation bursaries which respond to 4IR needs in the sector.

8. **Fibre Processing & Manufacturing Sector Education and Training Authority (FP &M SETA)**

8.1 The SETA has reviewed occupational qualifications to be registered with Quality Council for Trades and Occupations (QCTO) ensuring that 4IR skills focusing on digitization and innovation are incorporated in the updated occupational curricula.

8.2 The FP&M SETA has implemented a number of technical & innovative projects in partnership with FP&M SETA employer associations and large employers to address Business Economic Recovery and Reconstruction (ERRP) e.g., National Bargaining Council for Clothing Industries, Printing South Africa, Forestry South Africa, Celrose Clothing, TVET SA and Prestige Clothing to upskill employees. Learnerships & skills programmes focused on automation, digitising design (CAD & CAM) and preproduction processes, use of artificial intelligence, use of additive manufacturing, robotics and coding, entrepreneurship and business coaching and mentoring.

8.3 The FP&M SETA has prioritized Economic Recovery and Reconstruction (ERRP) promoting sector growth, employment retention and sustainability.

8.4 The FP&M SETA funded workshops, skills summit and conferences to support promotion and advocacy of 4IR skills and skills for the digital economy for employees e.g. FP&M SETA Skills Summit - Future Perfect Digital and Innovation skills for business recovery and reconstruction, IPM Conference.

8.5 As per Annual Performance Plan 2022/23, targets were increased for occupational programmes to reskill and upskill workers for job sustainability.

8.6 Temporary Employer-Employee Relief Scheme (TERS) promotes upskilling of workers facing possible retrenchment, in entrepreneurship, 4IR skills and business coaching and mentoring.

8.7 4IR skills incorporated into FP&M SETA priority skills to be promoted in FP&M sector - robotics, artificial intelligence and machine learning, big data specialists, analytics, Internet of Things, Block Chain, Automation, augmented reality, cyber security, data analysis and cloud computing.

9. **Financial and Accounting Services Sector Education and Training Authority (FASSET)**

9.1 The SETA has introduced an indicator in the Annual Performance Plan for 2022/2023

to do digital skills trainings for unemployed youth. The Sector Skills Plan for the sector identified some Information and Communication Technology skills like software development, systems administration. The response from FASSET was to pilot a digital skills programme where FASSET has developed two initiatives: the SETA adopted Microsoft Power Apps as a platform of choice because of the dominance of Microsoft in the desktop space. The platform was also selected because of the low-code requirement and the SETA has allocated around R5m to train 500 leaners in the following areas: Microsoft Office, Microsoft Digital Literacy, Microsoft Digital Literacy for Windows, Microsoft Planner, Microsoft data analytics, Microsoft Power BI, Analysing Data with Power BI.

10. **Health and Welfare Sector Education and Training Authority (HWSETA)**

10.1 To facilitate effective workplace training and to adequately prepare students with tools to deal with the “Fourth Industrial Revolution” in line with the requirements of the health and welfare sector, the HWSETA in its funding interventions includes special funding that prepares students adequately for the new workplaces.

10.2 To prepare students for the Fourth Industrial Revolution, the HWSETA incorporates some technical and work readiness skills into the funding model. These include: **Work readiness:** Resume writing, self-presentation, time management, professionalism, and work etiquette and **Technical Skills:** Technology-based skills (Beginner, Intermediate or advanced computer programmes). Information technology students/ graduates are funded for coding or computer programming short programmes. These are applying to both employed and unemployed workers.

11. **Media Information and Communication Technologies SETA (MICTSETA)**

11.1 The MICT SETA has developed an Integrated Digital Skills Strategy (IDSS). This Strategy sets out a structured series of initiatives intended to contribute to the capacities of South Africans to meet the skills gap challenges arising from the increasing deployment and adoption of 4 IR technologies and the impact of these on the world of work, education and broader society.

11.2 To ensure that the South Africa especially the ICT Sector does not fall behind, the implementation of the Integrated Development Strategy has achieved the following:

* Developed a total of 28 4IR qualifications inclusive of full and part qualifications.
* Some of the qualifications have already been submitted to SAQA for final approval;
* Developed qualifications and submitted to QCTO for verification and recommendations to SAQA;
* Qualifications currently under development; and
* Established 4IR Research Chairs in Public Universities.

12. **Manufacturing Engineering & Related Services Education and Training Authority (MERSETA)**

12.1 The SETA is involved in a number of experiential learning and skills for 4th Industrial Revolution, with various universities such as: Cape Peninsula University of

Technology, Central University of Technology, Durban University of Technology, Mangosuthu University of Technology, Nelson Mandela University, North-West University, Rhodes University, Tshwane University of Technology, University of Cape Town, University of The Free State, University of the Western Cape, Vaal University of Technology; and Technical and Vocational Education and Training Colleges such as: Vuselela TVET College, Boland TVET College, College of Cape Town, East Cape Midlands TVET College, Ehlanzeni TVET College, Ekurhuleni East TVET College, False Bay TVET College, Vhembe TVET College, Ekurhuleni West TVET College and False Bay TVET College.

13. **Public Service Sector Education and Training Authority (PSETA)**

13.1 The PSETA has partnered with Microsoft South Africa to provide digital skills programmes to public sector employees. The online platform, Batho Pele Digital Skills enabled by Microsoft Community Training, gives public servants free access to learning content ranging from entry-level digital literacy skills to advanced skills for technical roles. The programmes on the platform are available to the entire public sector, from local, provincial, and national government to the legislative sector, public entities and state-owned entities. The courses offered are basic digital skills and digital literacy and Microsoft office programmes used in the workplace.

13.2 For the unemployed the PSETA has partnered with Microsoft South Africa and its implementing partner Afrika Tikkun Services on the Global Skills Initiative South Africa (GSISA) in rolling out digital skills across the country. PSETA is a strategic partner to the project and supports unemployed learners to access this opportunity and promote the initiative through its networks to ensure that as many unemployed learners as possible have free access to the best resources, to improve knowledge and capabilities.

PSETA has allocated per province a minimum of 2 000 spaces for unemployed South African citizens to participate in this programme.

14. **Safety and Security Education and Training Authority (SASSETA)**

14.1 For the current workforce, SASSETA offers drone pilot training to the private security and policing subsectors; and electronic case and evidence management (court online, and caselines) training to the Justice and Legal Services subsectors.

14.2 For unemployed youth, SASSETA has awarded R15 million in bursaries to Universities South Africa to assist with the historical debt of students so that they can graduate and enter the economy; and R3 million to the University of the Witwatersrand to assist with the registration of new students. The target for both interventions is ‘missing middle’ students who are studying in the 4IR fields that are relevant to SASSETA and in terms of the Occupations listed in the Economic Reconstruction and Recovery Plan. Examples of this are ICT Systems Analyst; ICT Security Specialists and Computer

Network and Systems Engineers; Software Developer, Programmer Analyst, Developer Programme, and ICT Project Manager.

**15. Transport Education and Training Authority (TETA).**

15.1 To understand the Transport Sector’s 4IR skills needs and occupations that are affected by the emerging technology and might require re-skilling and upskilling; TETA has commissioned a research study on the Impact of 4IR on the sector. The research study is aimed at identifying 4IR skills sets for all 8 sub-sectors in the transport sector. To ensure that the transport sector workforce is upskilled and reskilled; and that the unemployed receive training that will increase their employability, partnerships will be formed with institutions in the post school system to include the 4IR skills and occupations in curriculum. TETA entered a partnership with Stellenbosch University and Tshwane University of Technology to develop training programmes that will address the 4IR skills needs in the industry. Part of these projects include training the employed in the industry and unemployed on the developed 4IR training programmes.

The TETA is also funding projects to provide training for drone pilots to respond to the need of drones across all sectors of the economy.

15.2 The SETA is also funding unemployed learners on drone pilot training.

16. **Wholesale and Retail Sector Education and Training Authority (W &RSETA)**

16.1 In line with the Annual Performance Plan (APP), the W&RSETA is providing bursaries to the unemployed youth within the sector in the following 4th IR related occupations: Software Developer; Business Analysts and Computer network engineer; Systems engineer; Data Analyst; System Architect; Data Scientist; Programming; Cyber security, and Mobile Application Designer.

17. **Services Sector Education and Training Authority (Services SETA)**

17.1 The Services SETA conducted research studies to understand the impact of 4IR on the services sector workforce. Findings of these have informed the update of the Sector Skills Plan 2022/23 and the Annual Performance Plan 2022/23 targets. To respond to these challenges the Services SETA has prioritised capacity to supply, focused on development of occupational qualifications and short skills programmes to address skills scarcity and to offer the current workforce that may face redundancy due to 4IR second opportunities.

17.2 The following short skills programmes have been finalised and registered with the QCTO: Spatial Intelligence Data Scientist and Advanced Spatial Intelligence Data Scientist.

17.3 The Services SETA Sector Skills Plan 2022/23 prioritises ERRP Skills Strategy with a specific on digital skills (4IR) and the Annual Performance Plan 2022/23 will prioritise these digital skills through short Skills Programmes, Learnerships, Internships and Bursaries among others such as: Data Centre Operations; Data Analysis; Data Science; Internet of Things; Cybersecurity and Digital Marketing.