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Food & Beverages Manufacturing
Sector Education and Training Authority

Linking 4IR Skills and Technical and Vocational Education and Training (TVET) Qualifications through an Enabled System

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ABSTRACT

The world has significantly transformed due to technological advancements requiring the need for the workforce to adapt to these changes. As the manufacturing sector has become increasingly tech-savvy, the workforce within the sector should possess and adopt digital skills. Technical and Vocational Education and Training (TVET) colleges should be in a prime position to equip entrants into the labour market with digital skills, however, currently are unable to adequately offer these skills. The study aims to identify digital skills and what needs to be done by TVET colleges to offer digital skills to the labour force. Using a mixed method approach, a (quantitative) descriptive analysis and (qualitative) document analysis on policies and presentations hope to achieve the aims of the study. The study found that several digital skills clusters such as: data science and data analytics, business analysis and digital marketing were constantly found to be high across the years. Furthermore, the review of qualifications, lecturer development and building digital capacity within the system is necessary to enable TVETs to offer digital skills.

1. INTRODUCTION

The world has significantly transformed due to technological advancements requiring the need for the workforce to adapt to these changes. The advances associated with technological transformation were mainly driven by research, innovation, the human competitive nature to improve, and globalisation. It is also important to highlight that, the manufacturing sector has always been at the forefront of advancements in technology and industrialisation. As the Manufacturing sector has become increasingly tech-savvy, the workforce within the sector should possess and adopt digital skills. It is noteworthy that within the Food and Beverages Manufacturing Sector, the lack of digital skills has been identified as significant among the various occupations. Skill development has been identified as one of the important discussion point in the evolution of technology and how the education sector responds. TVET institutions should be in a prime position to equip entrants into the labour market with digital skills. However, the graduates from TVET colleges have been argued to be of low quality and lacking key skills for the labour market. Therefore, the study determines what needs to be done by TVET colleges to offer digital skills to the labour force.

2. BACKGROUND

Across the world there have been various revolutions, however, for this study, the discussion is limited to the industrial revolutions. Three stages have mainly characterised the industrial revolutions. While the world is transitioning into the Fourth Industrial Revolution which is the

application of information and communications technologies, South Africa is still lagging as it is in the 3rd revolution. Economies across the world shifted from rural agrarian to urban mechanised production which was the 1st revolution. This first revolution was tied to the economic system of capitalism. Moreover, with the 1st Revolution, key advances arose from the applications of water and steam power to cotton spinning, steamships and railways (Sutherland, 2020). The 2nd Industrial Revolution, which accompanied colonial expansion across the world, was characterised by building on what was already established as well as mass production and distribution. Development of water and electricity networks to bolter mass production and distribution. Combustion engines were built for ground and air transport which improved distribution. According to Sutherland (2020) and Shah *et al*. (2020), the 3rd industrial revolution is characterised by digitisation which is the transformation of the economy to an integrated global production system. Digitisation is the process of converting routine activities and integrating them into digital formats. This was a period that experienced significant advances in computing and improved networks, with steep price reductions and rapid quality improvements on manufactured goods. Key innovations and improvements in the personalisation of devices, email, faxes, photocopying, electronic documents, the Internet, e-commerce, and barcodes.

The world of work has significantly changed from the inception of the 3rd Industrial Revolution in the 1960s to the current decade. The key innovations of the 1960s have significantly transformed or improved through the introduction of newer technologies like smartphones, personal computers, and AI technologies from photocopying and fax machines (Shah *et al*., 2020; Allmann & Blank, 2021). Over recent decades there have been rapid advancements in the manufacturing sector. Digitisation is the primary step of integrating and connecting routine and manual work routines into a digital format. Simply, it is defined as the advancements in technology. Digital skills are thus required to adapt to a digitised environment. Digital skills are defined as the ability to find, create, use, evaluate, and share content using digital tools, such as computers and smartphones (Shah et al., 2020; Laar, 2019).

The increased digitisation of the manufacturing sector has not translated into an adequately equipped labour force in the sector. However, TVET colleges can be a vehicle for enabling and offering digital skills in partnership with industry in a systematic skill formation. The traditional manufacturing model involves intensive labour and the increase in technologies decreases the need for intensive labour which can potentially lead to job losses. Consequently, employees are inherently fearful and resistant to adapting to new technology. Furthermore, employees' social environments are not often digitalised and their engagement with technologies is limited. However, TEVTs are in the prime position in the Post School

Education and Training (PSET) sector to offer digital skills training and courses (Sebola, 2022).

2.1 Rationale

It is important to equip future labour market entrants with relevant digital skills to prepare for the changing nature of work in the food and beverages manufacturing sector. Although there is little to no evidence of the extent of digitisation in the sector, it remains paramount that the country's labour force is in a position to adapt to any change (Laar, 2019). Digitisation in the world of work and manufacturing is a reality which cannot be stopped. Digitisation has resulted in increased use of digital technologies within industries, which has increased productivity through streamlining of processes, ultimately producing better products. The process of digitisation to the 4IR continuum cannot be predicted. However, the PSET sector can prepare the future workforce for any developments in the world of work, and it starts with entrants in the labour market. TVETs play an important role as they are the initial higher educational institutions which school leavers (Gr 9-12) choose to attend, especially those who do not complete Grade 12. TVETs can be a vehicle for the enhancement of digital skills and in the future offer short courses.

2.2 Research Objectives and Questions

2.2.1 Research Objectives

1. The study aims to identify what digital skills identified for the sector can be linked to TVET qualifications.

The aim of the study is achieved through the following specific objectives:

i. To identify possible digital skills the Food and Beverage Manufacturing Sector may require.
ii. To identify which digital skills can be linked with specific TVET qualifications..
iii. To identify key actors and enabling factors of TVETs transition to digital skills.
iv. To explore challenges and enablers of implementing digital skills at TVETs.

2.2.2 Research Questions

1. What do TVET colleges need to do to adequately to offer responsive digital skills for the labour market?

The question above is supported by the following questions:

i. What digital skills are possibly required in the sector?
ii. What are the challenges and enablers of implementing digital skills at TVETs?

3. LITERATURE REVIEW

The increased digitisation of the manufacturing sector has increased productivity, however, the employees have not been able to adapt adequately. The following review will discuss the possible 4IR skills required to adapt to advanced technology in the manufacturing sector. The review also discusses the state of TVET colleges and their challenges with digitisation. Lastly, the review will discuss the possible ways in which TVETs could adapt.

3.1 Fourth Industrial Skills Needs

Over recent years 4IR skills have become an important skill to possess, however, the term has been loosely used and often drilled down to digital skills. Skills development amid the fourth industrial revolution is critical in ensuring that employees do not get left behind in the process. OECD (2017: p2) emphasised the need to equip people with the "right type of skills to successfully navigate through an ever-changing, technology-rich work environment, and allow all workers to continuously maintain their skills, upskill and reskill throughout their working lives". However, before pursuing skills development in the 4IR space, there has to be an understanding of the skills being referred to and identify what skills are to be trained on. The definition of 4IR skills was coined by the World Economic Forum report "Skills of the Future". Union, et al. (2017:4) define digital skills as "a range of different abilities, many of which are not only 'skills' per se, but a combination of behaviours, expertise, know-how, work habits, character traits, dispositions and critical understandings". Specifically, it is the use of these skills to create and share digital content, communicate, collaborate, and solve problems, leading to effective and creative self-fulfilment in life, learning, work, and social activities.". Laar, (2019) defines it as "the capacity to put one's abilities into action and to act consciously and effectively with a purpose". These definitions involve the capacity to put one's ability to interact, use, interpret and share content in a digitalised environment. The study, therefore, adopts this understanding for the study but technically uses the definition by Union, et al.

With work becoming more customisable the expectations for individual workers' skill levels have risen, posing a challenge in preparing individuals for the digital age (UNDP, 2022), thus important to understand the skills under discussion. In the search for these types of digital skills literature will provide a vast list of skills which have to be understood on a skills competence continuum. Digital skills like any other skills vary and are on a continuum ranging from beginner, intermediate to advanced and specialised (DE4A, 2021). Skills adaption or adoption is on a continuum ranging from beginner, intermediate and advanced levels based on the social or work environment a person is in. The adoption of digital skills in the mentioned environments is required to adapt as required to the changing world of work. Literature and internet searches offer a wide array of conceptions and definitions of digital skills because of

the various ways and extent to which employees need to be digitally competent in different contexts. Below are some of the results from literature and internet sources:

Table 1:Skills Domains[i]

Skills Domains	
Machine Learning	Social Media Marketing
Cloud Computing	Mobile App Development
Digital Marking	Digital Project Management
Data Science and Analysis	Cybersecurity
Cloud Development	Artificial Intelligence (AI) and Machine Learning
Programming and Software Development	Web Development and Programming
Web development	Digital Marketing

Sources: Multiple sources use can be found in the end note

However, it is important to distinguish these skills from full qualifications and subsequent occupations/jobs which are specialised. Although this paper is not primarily about full qualifications or occupations in the digital space, it is important to take note of how digital skills can be advanced and lead to specialised occupations/jobs. Below is a list of occupations, not limited to, the digital space.

Table 2: Occupations in the Information Technology Space[ii]

Occupations	
Programme Developer	Desktop Support Technician
Cyber Security Specialist	Junior Software Developer
ICT Engineer	Data Analyst
Lead Solutions Architect	Cyber Internet Technologist
Information Communication Technologist	Mid-Level Development Operations Engineer
Senior UX/UI Designer	Mid-Level Developer

Source: Multiple sources use can be found in the end note

3.2 The Role of TVET Colleges in South Africa

The purpose of TVET colleges in South Africa is to provide students with the opportunity to gain knowledge, practical skills and applied vocational and occupational competence (Sebola, 2022). It was envisioned that Further Education and Training (FET) colleges, currently known as TVETs, would function as an open learning system that was responsive to the needs of individuals and communities. They would also contribute to the development of the country's human resources by offering flexible, relevant, accessible, and high-quality FET programmes to all eligible citizens who can benefit from them. The Department of Education believed that it would help develop human talents and abilities, address past inequalities, and contribute to building a just, democratic, and prosperous society (DOE, 1998). Thus, TVETs can offer a

valuable opportunity to facilitate the teaching of digital skills as they are institutions of higher learning that in principle, should be, responsive to industry needs.

Since 1994, TVET colleges (formerly known as Further Education and Training colleges) in South Africa have undergone multiple transformations and reforms that have resulted in pointed developments (Sithole et al, 2022). South Africa's Apartheid legacy separated technical colleges along racial lines which promoted unequal participation and limited access for the previously disadvantaged. Even though technical colleges opened their registrations to all races before 1994, disparities have continued to exist. The levels of resources and funding investment in these institutions reflected the legacy of desperate and unfair funding for underprivileged colleges. The legacy was vivid in the mergers with privileged colleges having better resources, equipment and personnel compared to underprivileged colleges. After the establishment of the democratic government in 1994, it inherited 152 technical colleges and initiated the process of merging colleges to create a more equitable and equal Further Education Training (FET) system for all. The merging of former technical colleges, colleges of education, and training centres would shape the landscape for Further Education and Training (Sithole et al, 2022). The merger was also an attempt to shed the negative image of the old technical college system by combining the smaller and weaker colleges into stronger TVET institutions. However, due to a mirage of challenges identified by the National Committee on Further Education's draft report on the technical colleges, the government adopted and implemented the FET Act of 1998. The Act of 1998 aimed to address the challenges identified in the report and provide a blueprint for the amalgamation of 152 colleges into 50 multi-campus colleges.

The root challenges were acerbated during the Coronavirus Disease 2019 (COVID-19) pandemic and exposed the lack of 4IR readiness of TVET colleges. The amalgamation of colleges was aimed at levelling the inequalities to create a stronger system among colleges but, the pre-existing challenges of inadequate infrastructure, funding constraints, incoherent policies and curriculum alignment continue to plague institutions (Buthelezi, 2018). It was found that three TVET colleges were still found to be irrelevant, unable to respond to the current workplace demands and not prepared for 4IR, (Makgato, 2019). The COVID-19 pandemic forced colleges to expatiate digital transformation in colleges in the face of ongoing challenges. According to the Denhere et al. (2021) findings, most public TVET colleges were caught unaware of the 4IR-related demand created by the pandemic. TVETs started or intensified their 4IR preparations to mitigate the effects of the pandemic. However, lack of computing equipment, inadequate ICT infrastructure, lack of or inadequate teaching and learning technologies, insufficient training for teaching staff on the use of available technology,

poor connectivity, etc. created significant challenges for teaching and learning (Denhere, et al. 2021).

The COVID-19 pandemic forced tertiary education to abruptly shift to online learning, highlighting the unpreparedness of the educational system. Lectures and students were forced to adopt digital ways to continue to participate in the education system. Papier (2011) found that lecturers are caught between being “teachers” and “industry experts” which has become a difficult sphere to navigate. Most lecturers are neither experts nor lecturers in both fields and are found to have been employed with no qualifications. Lecturers were found ineffective in adapting and using technology to facilitate teaching and faced significant challenges. Recently a study focussing on 4IR readiness found that lecturers at colleges required reskilling and upskilling to keep abreast with the latest technological developments (Makgato, 2019). This along with the pedagogical challenges that lecturers face regarding teaching. The role of lecturers in TVETs is pivotal and if they are unable to engage, integrate and use technology in facilitating teaching, it is a major obstacle. Thus, hampering the growth and development of TVETs to be able to respond to the needs of communities and the economic sectors in the era of increased digitisation.

3.3 TVET Innovations and Opportunities of Digitisation in TVETs

There has been innovation and success against challenges across the African continent in the digitisation of TVETs. Many of the countries in Africa experience similar challenges to the TVETs and the digitisation of the system (UNESCO, 2022). Lack of adequate equipment and technological equipment, lack of adequate financial resourcing, lack of internet access, and curriculum misalignment with industry are some of the common challenges. These challenges are attempting to be tackled by various role players in respective countries. As indicated in the UNESCO report (2002) public-private partnerships are paramount in the digitisation of the TVET system as the digitisation process is expensive. The Constitution of the Federal Government of Nigeria has made it possible for private sector role players, NGOs, and any interested parties to participate in the activities of digitisation of the TVETs space. This has decentralised planning and enables the effective mobilisation of funds and personnel for projects (UNESCO, 2022). For example, a private actor, Etiwa, in Nigeria, has created some online courses for the construction sector and Lagos State Technical and Vocational Education Board (LASTVEB) has developed a Learning Management System (LMS) for its vocational training programme. In Kenya, TVET colleges have adopted e-learning and digitized their learning programmes by creating an online Learning Management System (LMS) called CAPYEI LMS for learners (Nyamai, 2020). The system was first tested in two TVET colleges, Othaya and Muyene. The partnership was launched between Kenya's

education minister, CAP Youth Empowerment Institution, and MasterCard. The LMS is available on the Internet and as a mobile application, providing access to the digitized curriculum, delivering training, improving communication, tracking and grading trainees, and managing educational content, among other features (Nyamai, 2020).

There is a vast amount of evidence that digitisation in the TVET system can be achieved, however, the government, private sector and actors need to work together on a concrete policy and plan to achieve this.

4. METHODOLOGY

4.1 Research Methods

A mixed method which combines and integrates qualitative and quantitative research methods is employed in this study. For this particular study, a mixed methods research was chosen to use different research techniques to develop a deeper understanding of the topic being studied. The qualitative component includes a review of documents or document analysis. In addition to reviewing pre-existing FoodBev SETA Learner report data, a descriptive analysis of numerical data from FoodBev SETA Workplace Skill Plans (WSP) and Annual Training Reports (ATR) was performed which constitutes the quantitative aspect of the study. A detailed discussion of how data was collected and analysed is provided below.

4.2 Data Analysis

Since the study relied on pre-existing data, data analysis was performed sequentially in line with the objectives of the study. Firstly, an analysis of the FoodBev SETA WSP/ATR data for 2021, 2022 and 2023 completed by stakeholders of registered SETA companies, specifically the Hard to Fill Vacancies, and FoodBev SETA learners bursary report was conducted. The Workplace Skills Plans outline the existing skills shortage in companies and describe the steps companies will take to address the shortage through various training initiatives covering the period 01st of April of a particular year to 31st of March of the following year, of respective years. On the other hand, the Annual Training Report documents the progress made by companies in implementing the previous year's WSP. Although most of the sheets are compulsory in the WSP/ATR template, the Hard To Fill Vacancy sheet is an exception because only the companies that had vacancies in the respective financial year fill out the sheets. In 2021 (507) companies completed the sheet, (508) companies completed the sheet in 2022 and (507) companies completed the same in 2023. The analysis of hard-to-fill vacancies data was performed to identify possible digital skills the sector may require in future. This involved the analysis of the data related to digital skills which is a response to the following question on the WSP/ATR: What digital skills gap does this occupation have? The response

to the question used check boxes and the responses were analysed, tabulated and presented in the results and discussion section of the paper. This analysis was conducted on Microsoft Excel, using pivot tables which would produce a descriptive analysis. The data was analysed by year, and each of the responses was summed and converted into percentages. This would produce the digital skills required by companies by percentage.

The analysis of WSP/ATR data was followed by an analysis of documents or a review of documents. The method usually involves a systematic review or evaluation of documents to uncover meanings, develop understanding and discover insights relevant to the research problem. Initially, the research aimed to gather interviews from stakeholders in the Post-school Education and Training in South Africa (PSET) system, particularly those responsible for TVETs. However, gaining access to the stakeholders proved to be difficult. To address this challenge, document analysis of (newspaper articles, bulletins, PowerPoint presentations by DHET officials, policies or policy directives and government gazettes in the post-school education and training system). Identifying key actors and factors in TVETs transitioning into the digital space is essential for this research. Moreover, the documents were read thoroughly to explore the challenges and enablers of implementing digital skills in TVETs.

4.3 Study Limitations

The study has a few assumptions and limitations that emanate from a conceptual understanding of the topic which resulted in limitations. The study based on the assumption that there has been work done around the level of digitisation in the sector which would necessitate the current study. The study had one limitation which was the inability to gain access to DHET officials, thus restricting how the third and second objectives of the study are addressed in this paper.

5. RESULTS AND DISCUSSION

The section presents an analysis of the WSP/ATR data and documents and discusses the challenges and opportunities of digitisation in the TVET space. The section is divided into two sections, firstly, the presentation of the identified digital skills with a discussion on how these skills can be integrated into the current programme. Secondly, discusses the challenges and enablers of digitisation in TVETs.

5.1. Digital Skills and TVET Qualifications

The following section presents the results of the analysis of the 2021, 2022 and 2023 WSP, specifically of the digital skills. The section also attempts to link, as far as possible, the identified digital skills with TVET qualifications related to the food and beverage manufacturing sector. The results respond to the specific objectives: (i) to identify possible digital skills the

Food and Beverage Manufacturing Sector may require, and (ii) to identify what digital skills can be linked to which TVET qualifications. The table below shows the cluster of digital skills for the respective years.

Figure 1: List of Identified Digital Skills Clusters

2021		2022		2023	
Digital Skills Gap	%	Digital Skills Gap	%	Digital Skills Gap	%
Data Science and Data Analytics	21	Digital Marketing	25	Data Science and Data Analytics	25
Digital Business Analysis	19	Data Science and Data Analytics	25	Digital Marketing	23
Digital Marketing	21	Digital Business Analysis	24	Digital Business Analysis	18
Digital Project Management	24	Digital Project Management	19	Digital Project Management	17
Other	14	Robotics	6	Robotics	10
		Computer Skills	1	Computer Literacy	3
		Other	1	Other	4

Source: WSP/ATR (2021, 2022 & 2023)

The above is an indication of the digital skills gaps according to the WSP/ATR data on HTFV over three years. Data science and data analytics, business analysis and digital marketing were constantly found to be high across the years. Computer literacy computer interface skills, Microsoft software skills, systems and logical thinking were some of the skills indicated under the category of other. The skills identified through the analysis of WSP/ATR data are in line with skills emanating from the review of documents and the existing literature. Mechatronics, robotics, computer programming, data computing and networking etc. are some of the digital skills clusters found through the review of documents (Modiba, 2021). The FoodBev SETA Sector Skills Plans (2021 & 2022) have indicated that the world of work has become more complex as a result of the advancements in technologies which require more analytical and logical thinking skills. Some of the common skills gaps related to technology included computer literacy, analytical thinking and logical thinking skills that employers believed employees required to adapt to changes in technologies in the sector successfully.

The digital skills clusters identified above can broadly or narrowly be nestled in qualifications in the TVET space, if not already embedded. What this means is that, in the broad sense, existing full qualifications can be leveraged and broken into micro-credentials to be added to every course or programme in TVETs. These micro-credentials would cater for every course or programme on a basic or intermediate level. The levels (basic or intermediate) would be decided based on the needs of a chosen course/qualification and industry-related demands. This would ensure that every student who goes through the TVET system has some level of digital skills. The narrow concept already exists within the current TVET system, several TVET colleges currently offer courses or occupational certificates etc in computer and digital-related skills. The offerings are aimed at equipping students with theoretical and practical knowledge for the work environment. However, the current offering may not be robust enough for the sector's needs.

The table below shows some of the TVET qualifications that emerged from an analysis of the FoodBev SETA learners' bursary report and how the identified digital skills can be linked to these TVET qualifications (objective ii). The example below uses TVET qualifications currently funded by the SETA as examples of how an integration as discussed could be possible. The first column of the table shows the course structure of an N4 Mechanical Engineering programme while on the right is an integrated programme with digital skills relevant[1]. From the identified skills presented: computer literacy, data science and data analytics, as well as robotics, are relevant to a programme such as Mechanical Engineering. Other digital skills that can be linked to qualification can be found in Annexure A. The column (table below) on the left shows the addition of the digital skill cluster components to the course.

Table 3: Digital Skills Clusters with Qualifications

Original TVET Qualifications: Mechanical Engineering N4	TVET Qualification with micro-credentials
Mathematics	Mathematics
Engineering Science	Engineering Science (A)* Computer Literacy
Electrotechnics	Electrotechnics (A)* Robotics
Methanogenic	Methanogenic (A)* data science and data analytics
Mechanical Draughting	Mechanical Draughting
Supervisory Management	Supervisory Management
Industrial Electronics	Industrial Electronics

Source: Ekurhuleni West TVET College 2023 Prospectus

***(A)** additional module

Document analysis revealed that TVET qualifications are being developed and recontextualised in line 4IR. In this TVET qualifications can indeed be developed and strengthened to provide these micro-credentials/streams with the contribution of private providers. The documents analysed, particularly DHET ones, indicated that there are several courses, in the IT field, which are being reviewed and developed. However, these credentials/streams should be strengthened to ensure that the objectives of their inclusion are met. TVETs can alternatively use free online courses as a part of the learning to bolster digital skills in the TVET system. For example, Microsoft has 108 free courses in which learners to gain experience in Microsoft programmes. In reviewing existing documents, the study found

[1] The researcher of this paper is not a qualification specialist or expert, thus the thoughts expressed are ideas on how to link digital skills to existing courses.

that there are various entities which offer free online courses in coding, programming and financial planning education[2]. These are short online courses that can build up digital skills.

Furthermore, based on the analysis of documents, it is also important that the current reviews of the curriculum are rigorous considering the perceptions of weak and unresponsive of the latter to the sector. It was found that DHET, in partnership with CISCO[3], has recently made strides to review and replace outdated qualifications with new ones that are more responsive to the economy. Among the reviews, there are specific programmes that have been updated to include technological advancements. This came out strongly in 2021 during a presentation by DHET on the integration of digital competencies in the national TVET curriculum. It was revealed that DHET reviewed the TVET Information Technology and Computer Science programmes and introduced a new stream that focuses on Robotics to allow students to choose between Programming and Robotics streams. According to DHET, some of the new subjects added to the curriculum include Electronic and Digital concepts for Robotics, Robotics Fundamentals and Robotics and Industrial Automation.

The inclusion of micro-credentials and continuing to strengthen current offerings are and will be an important enabler in the digitisation of the system. Public-private partnerships are important to strengthening the curriculum and go a long way in changing negative perceptions about TVET qualifications. A functional system is an important catalyst to achieve a TVET graduate population that has the relevant skills for the workplace.

5.2. Enablers and Challenges to TVET Digitisation

The analysis of the available documents revealed that, although the South African TVET system faces significant challenges to digitisation, some factors can be used as enablers. The following section of results aim to: (iii.) identify key actors and enabling factors of TVETS transition to digital skills as well as to (iv.) explore challenges and enablers of implementing digital skills at TVETs. It emerged from the documents that TVET colleges experienced a lot of lessons through the challenges of COVID which have to be leveraged and strengthened should the sector hope to move in a positive direction.

The existing literature suggests that one of the most central challenges to digitisation is using digital technology in teaching (Dept. Communications and Digital Technologies, 2020). The digital challenges that lecturers face are a significant barrier to a technologically advanced TVET system. Based on the documents reviewed, lecturers are central to theoretical and practical knowledge dissemination in the system meaning that their inability to adopt and adapt

[2] https://htxt.co.za/2023/12/12/mtn-launches-free-online-digital-skills-academy-across-africa/
[3] https://unevoc.unesco.org/bilt/africa-event/David_Modiba_Green_room_Day_1.pdf

to technology affects the way students adapt to technology. Thus, lecturers are potentially the most important enablers of digital skills transfer. This finding suggests that lecturers must possess adequate lecturing and digital skills to be able to teach students. Furthermore, lecturers need to be able to access tools such as laptops, tablets, smartphones WhatsApp, email, Microsoft etc, which would go a long way in building up the skills capacity.

The sector is increasingly recognising the importance of lecturers, as enablers, in the system and prioritising their teaching and digital skills development as they are central to the digitisation of the TVET system. The analysis of documents revealed that currently, DHET does have a capacity development programme for TVET lecturers about programmes that are in line with emerging technologies in different sectors of the South African economy. The capacitation of lecturers is consistent with literature which found that in countries such as Tanzania, lecture development was prioritised by providing continuous academic and technical support, mentoring, and conducting training workshops through external consultants (ILO,2021). The results of this study also show that the FoodBev SETA currently facilitates a TVET Lecturer Capacitation programme, which aims to expose TVET lecturers to the latest technological advancements and sector skills within the food and beverages manufacturing sector (FoodBev SETA, 2023). The examples mentioned are important factors in developing current lecturers in teaching in the age of advancing technology. Through sustained and meaningful partnerships, lecturers have a greater chance of bettering their skills.

In analysing documents, the study also found that many students experienced significant learning difficulties during the pandemic in adapting to the new ways of learning. The experiences and challenges of students are well documented in the literature but the results of this study indicate that the gains of adapting to online learning have to be continued and strengthened (Dept. Communications and Digital Technologies, 2020). TVET colleges cannot revert to the old ways of teaching and administration but have to adopt a digitally aligned pathway to ensure that students do become digitally literate, and ultimately have digital skills. This finding supports research which found that the TVET system cannot go back to the traditional forms of teaching and administration (Majumda et al. 2020). Put simply, TVETs, given respective inequalities, should build on and around the lessons of the COVID-19 pandemic. The challenges of access to enough data and having digital technologies should push TVETs to increase the availability of digital devices and technologies within the system. A student cannot learn technology theoretically but should be accompanied by devices. It was also found that digital infrastructure development is crucial to enabling digitisation in the TVET system (Dept. Communications and Digital Technologies, 2020). Technological devices and digital infrastructure are important enablers in a TVET environment, and their absence can be the biggest challenge.

6. CONCLUSION RECOMMENDATION

The purpose of the paper was to identify the digital skills for the food and beverage manufacturing sector and to connect these skills to qualifications in Technical and Vocational Education and Training (TVET). The paper also discussed the factors, challenges, and enablers of digitisation in the TVET system. The skills clusters identified in the paper indicate an increased need for digital skills in the sector. The paper demonstrated how these skills clusters can be connected to qualifications through systematic partnerships with stakeholders, government entities, and industries. Despite the challenges that TVETs face, the Department of Higher Education and Training (DHET) and its entities are making efforts to respond to digital skills needs. Stakeholders are investing in technologies that enable digital teaching and learning in the TVET system, as well as supporting the skills development of lecturers.

7. RECOMMENDATION

- The SETA should partner with MICT SETA, which has programmes which aim to address digital skills needs, to determine what programmes can the FoodBev SETA promote for adoption in the sector.
- The SETA should evaluate the outcomes of the TVET Lecturer Capacitation Programme to determine whether the programme is achieving its objectives. This will shed light on how to strengthen the programme or possibly change it.
- FoodBev SETA should partner with stakeholders to invest in a digitisation project within a TVET or a TVET space, based on a digital needs-based assessment.

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ANNEXURE A:

Qualification Name	Linked Digital Skills
National Certificate: N6 Marketing Management	Digital Project Management
	Computer Skills
National Certificate: N6 Public Management	Digital Project Management
	Computer Skills
National Certificate: N6 Human Resource Management	Computer Skills
National Certificate: N6 Financial Management	Digital Project Management
	Computer Skills
National Certificate: N6 Business Management	Digital Project Management
	Computer Skills
National Certificate: Electrical Engineering	Data Science and Data Analytics
	Digital Project Management
	Robotics
	Computer Skills
National Certificate: N6 Management Assistant	Computer Skills
	Digital Project Management

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