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Assessing the Role of Digital Literacy on Creating Youth Employment Opportunities in the Textile Industry in South Africa

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Abstract

Digital literacies are critical strategic organizational resources and skills that youth employees need to obtain to effectively function at their workplaces. Technology has spanned the globe and transformed how organizations operate, recruit employees, and communicate their needs. As a result, digital literacy skills remain a prerequisite to employment opportunities in today's competitive job market. The study aims to evaluate the importance of digital literacy in creating youth employment opportunities in the textile industry and the paper is underpinned by a conceptual framework, employing the empowerment theory. However, complemented by thematic content analysis of qualitative research. The findings showed that youth face several challenges as they transit from school to employment due to lack of experience and digital resources hence, youth struggle to make this shift, and they remain unskilled, underemployed, and unemployed, as the textile industry requires well-prepared and skilled employees, equipped with contemporary digital skills, and creativity to remain competitive in the global market. Thus, digital literacy emerges as a catalyst for employability, favouring those with skills over the unskilled. A robust and significant relationship was established between youth digital literacy and success in the textile sector. This means that the increase in youth's cognitive skills promoting critical thinking and creating information using digital technologies is positively related to the textile industry. Beyond the work environment, digital literacy also affects the way people live and communicate. This research contributes to the discourse on workforce readiness and industry sustainability by emphasizing

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the transformative role of digital literacy. The study underscores the urgency of integrating digital literacy into education and training systems to adequately prepare young individuals for the future of work.

KEYWORDS: Digital Literacy, Youth Employment Opportunities, Textile Industry, Empowerment Theory

1 Introduction

Youth unemployment remains disproportionately high in Africa. However, a growing digital economy, supported by improvements in Information and Communications Technology (ICT), including access to the internet, provides an opportunity for addressing youth unemployment (Barasa & Kiiru, 2023). Unemployment is influenced by multiple factors with one of these factors being an oversupply of low-skilled labour which is due to low investment in education (Government Communication Information System (GCIS), 2022). This further elucidates the mismatch between the demand for skills in the marketplace versus the availability of resources to employ. National Electronic Media Institute of South Africa (NEMISA) (2017) indicated that 59% of unemployed youths in South Africa had an education level below matric. As these figures indicate, the widening gap between those who are educated with basic literacy skills versus those who drop out of the educational system places further pressure on the education system to produce graduates who are prepared for the future of work (Whitfield & Mkhabela, 2023).

United Nations Educational Scientific and Cultural Organization (UNESCO), (2018) defines digital literacy as the ability to access, manage, understand, integrate, communicate, evaluate, and create information safely and appropriately through digital technologies for employment, decent jobs, and entrepreneurship. It is becoming increasingly important in all areas of professional life as technology has spanned the globe and transformed how organizations operate, recruit youth employees, and communicate their needs. As a result, digital literacy skills remain a prerequisite to youth employment opportunities in today's competitive job market (Nikou, Reuver & Kanafi, 2022). Further, new technologies in robotics, artificial intelligence, big data analytics, internet of things, smart sensors, and 3D printing are seen as disruptive technologies that will change manufacturing, as well as the way we live. Statistics South Africa (Stats SA, 2021) reported that South Africa's youth (15-34 years) unemployment rate reached 46,3% in the first three months of 2021. The future of work is digital however, digital literacy in South Africa is limping thus, getting training in digital skills allows the youth to take control of their lives and create their jobs (Virga & Zuccala, 2021). Therefore, the digital revolution is the best tool for tackling youth unemployment. The textile industry is of great importance to the economies of every country in terms of trade, employment, investment, and revenue, and in 2015, the size of the global textile market reached $1685 billion (Statista, 2018).

2 Problem Statement

The South African education system is ranked as the third lowest globally (World Economic Forum, 2016), while the country holds the highest digital literacy in Africa, particularly in comparison to Nigeria, Kenya, and Ethiopia (African Digitalization Maturity Report, 2017). However, there is a noted deficiency in digital training within South Africa, according to the same report (Chetty, Oigui, Gcora, Josie, Wenwei, Fang, 2018). Unemployment is prevalent in developing countries as the residents do not have skills in utilizing ICT and this means they cannot effectively participate in economic activities (Matli & Ngoepe, 2020). The mismatch between the demand for skills in the job market and the

availability of resources to employ exacerbates the issue. The textile manufacturing industry, with its high fixed capital investment and a wide range of product designs, presents harsh working conditions, long hours, and low wages for its workers, primarily women (Welamo & Sanpeng, 2021). The digital divide between men and women is a challenge in adopting digital technologies in the sector, affecting input materials, production volumes, competitiveness, and product quality (Tamas & Murar, 2019). The textile industry also grapples with a crisis of fake products, negatively impacting brand image and value, with blockchain technology emerging as a potential solution (Tripathi, Nautiyal, Ahad, & Feroz, 2021). Hence this study aims to access the role of digital literacy in creating youth employment opportunities in the textile industry. Further, the study seeks to provide insights into bridging the gap between demand and resources.

3 Aim and Objectives

3.1 The Aim of the study

The study aims to assess the role of digital literacy on creating youth employment opportunities in the textile industry.

3.2 Objectives of the study

To evaluate the level of youth digital literacy in the textile industry.
To determine factors that lead to youth employment in the textile industry.

4 Research questions

- What is the level of youth digital literacy in the textile industry?
- What are the determinants of youth employment in the textile industry?

5 Contextualising digital literacy

The concept of digital literacy came into widespread use after the release of Paul Glister's book Digital Literacy edited in 1997 (Gilster, 1997). The perception of digital youth has grown in importance in light of the technological developments and digital skills demands of the 21st century (Helsper, 2016). Young people's digital skills are misinterpreted by others, and young people themselves misjudge and overestimate their digital skills (ICDL, 2018 & Sciumbata, 2020). In the contemporary society of the digital economy, the ability of youth to face and adapt to emerging environments largely depends on their attitudes, habits, and knowledge related to the use of digital literacy skills (Luic & Alić, 2022). However, digital literacy is needed with the hope that the education and learning process will become more collaborative and elaborate. In terms of digital competence, it contains professional engagement, digital resources, design, marketing, distribution, empowering youth, and facilitating youth's digital competence (Yazon et al., 2019). It also enables them to utilize digital tools to promote their creativity and innovation in textile design and production (Lahiri, Deb Roy & Jana, 2022). Digital literacy in the context of the textile industry refers to the ability of individuals to effectively use digital tools and technologies within various aspects of the textile sector (Lahiri et al., 2022).

6 Definition of concepts

Fourth Industrial Revolution

The fourth industrial it is an unfolding world of digitalisation that fuses technologies and blurs the lines between physical, digital, and biological aspects enabling people to transition between the digital world and digital reality using technology to manage their lives (Oman, 2021; Xu & Kim, 2018).

Digital skills

According to Gomez (2021), views digital skills as the ability to use digital technology to access, organize, comprehend, integrate, communicate, assess, and produce information for work, respectable occupations, and entrepreneurship.

Employment

Employment refers to the state or condition of being employed, which essentially means having a job or being engaged in paid work for an employer or as a self-employed individual (Shen & Zheng, 2020).

Textile industry

The textile industry is primarily concerned with the design and production of yarn, cloth, clothing, and their distribution (Saha, Dey & Papagiannaki, 2022). Thus, the raw material may be natural or synthetic using products of the chemical industry.

7 Literature review

The section describes the theory adopted by the study and empirical literature; the previous studies related to the study to develop a framework.

7.1 Theoretical framework

The theoretical framework employed in the study is the empowerment theory, when applied to digital literacy and youth empowerment, unveils the profound potential for individual and collective advancement (Clapp, Ross, Ryan, & Tishman, 2016). The empowerment theory originates from American community psychology and is associated with social science (Rappaport, 1981). However, the roots of empowerment theory extend further into history and are linked to Marxist sociological theory "Empowerment is viewed as a process: the mechanism by which people, organizations, and communities gain mastery over their lives". According to Adams (2017), empowerment theory is rooted in social work, psychology, and community development which provides a comprehensive framework for understanding how individuals, particularly youth can gain control over their lives, make informed decisions, and actively participate in shaping their own futures. Thus, when applied to the world of digital literacy and youth empowerment, this theory becomes a powerful lens through which to examine how digital skills and knowledge can transform the lives of young individuals and empower them to take control of their personal and professional trajectories. Empowerment theory posits that empowerment is a multidimensional construct, encompassing both intrapersonal and structural aspects (Lardier, Garcia-Reid, and Reid, 2019). Falloon (2020) states that digital literacy equips young individuals with the knowledge and skills needed to navigate the digital landscape. Monje-Amor, Vázquez and Faíña (2020) states that the structural dimension of empowerment, access to digital resources and opportunities plays a critical role. The intersection between digital and empowerment not only aligns with the core principles of empowerment theory but also underscores the significance of digital literacy as a force for positive change in the lives of the youth and the communities they inhabit.

This intersection is a catalyst for personal and professional growth leading to a more empowered and engaging youth population, driving positive change in societies worldwide (MonjeAmor, et al., 2020).

7.2 Empirical Literature

7.2.1. The role of digital literacy in the textile industry

The current textile manufacturing, automation is widespread, with computer-controlled machinery managing several processes (Duarte, Sanches, & Dedini, 2018). Digital literacy in the textile industry encompasses knowledge on controlling, navigating, and troubleshooting technical challenges, ensuring optimal productivity thus, the textile industry previously deemed traditional and labour-intensive, is experiencing changes shifting towards a technology-driven sector, and embracing innovative digital technologies (Duarte et al., 2018). Additionally, according to Zhang, Kang, Hou, Shao, Sun, Qin, and Zhang, (2018) smart textiles, 3D body scanning ensure precision in measurements, and using artificial intelligence (AI) to enhance design and trend forecasting has become essential components in the industry's operations. As such, digital literacy in the sector is more than just basic technical skills; it includes the ability to navigate and control these systems, troubleshoot technical issues, and maximize productivity (Ogunyemi, Diyaolu, Awoyelu, Bakare, Oluwatope, 2022). According to Lahiri et al., (2022), the textile industry is experiencing a transformation with the use of smart textiles and digital literacy. Young people who possess digital skills can contribute significantly to the creation and management of smart textiles, which can lead to opportunities for career development in the textile sector.

Nayak & Padhye, (2018) states that digital literacy is crucial for the younger generation to work with these technologies, enabling them to handle precise body measurements, create virtual, fitting rooms and generate personalized avatars for consumers. Matli & Ngoepe (2020) emphasize that digital literacy allows younger individuals in the textile industry to anticipate market trends and stay ahead of the competition. Utilising data analysis enables them to track emerging fashion trends, identify shifts in consumer preferences, and anticipate market demands. This proactive approach is valuable in the dynamic and fast changing world of the textile industry.

7.2.2. The level of youth digital literacy in the textile industry

7.2.2.1. Youth (Un) employment

Rahman et al. (2020) has found that skills mismatch is one of the most important causes of youth unemployment and suggests that the country must change its education system according to the growing demand for skills. The ILO's (2018) statistics indicate that the youth constitute about 43.7% of the unemployed people in the whole world and that the global youth unemployment average is 12.6%. De Lannoy et al., (2018) one of the macro-level concerns driving the unemployment problem is a shortage of skills, which they discovered many companies place a premium on. Digital literacy skills are essential for entry- level positions in the textile industry, to be creative and innovative.

7.2.2.2. Skills Gap

Fletcher and Tyson, (2017), state the solution to resolve the skills gap, educational systems must be reoriented, with a focus on Technical and Vocational Education and Training (TVET) and work-based learning. TVET is concerned with the acquisition of knowledge and skills for the world of work and includes education, training, and skills development to meet the needs of occupations, production, services, and livelihoods (Kanwar et al., 2019). According to the ILO (2018) states that many jobs remain unfilled due to a lack of the desired skills. This underscores the importance of TVET as a potential solution to the issue of unemployment. By providing training to youth in the textile industry, specifically in machine operation and creative utilization of unique materials, TVET programs can equip individuals with the necessary skills to fill these vacant positions (World Bank, 2018).

The textile manufacturing industry employs over 75 million people worldwide with an aggregate export amount over US$744 billion in 2015 (World Trade Organization, 2015). It is widely accepted that experience on the job is valued and rewarded, both as a signal that these employability skills have been acquired as well as reflecting real skill gains acquired through work and youth who have acquired socioemotional skills may have trouble signaling this result (Carranza et al., 2020).

7.2.3. Factors that lead to youth employment in the textile industry

7.2.3.1. Digital literacy and youth employment opportunities

Digital literacy is the ability to access, manage, understand, integrate, communicate, evaluate, and create information safely and appropriately through digital technologies for employment, decent jobs, and entrepreneurship (Nurhayati & Falah, 2020). Textile Industry, numerous software tools are created to improve the efficiency of the work thus, the economy should ensure that youth acquire the necessary digital literacy skills for new employment opportunities (McKinsey, 2020). Digital literacy skills are a key tool for fostering young people's career advancement, given that they have a positive effect on psychosocial well- being and self-esteem (Martinovic, et al., 2019). The major opportunities of digitalization are increasing productivity, rising employment opportunities in the form of wider product variety and the option to manufacture the textiles at home using three-dimensional 3-D technologies (Kanupriya, 2021). Textile Industry is an engineering (practical) discipline that focuses on the various aspects of design, production, and marketing of clothing materials (Terziey, et al., 2023).

Young workers are the most vulnerable category in terms of unemployment (McKinsey, 2020). Thus, the digital literacy is perceived as the ability to use information technology for both information sharing and information creation practices and is concerned with how young people access and engage with content as well as the 'availability of content appropriate to the needs of users and opportunities to translate these activities into beneficial outcomes in everyday life (Helsper, 2016).

7.2.3.2. Digital literacy and textile industry

Digital literacy is an important and evolving concept that has influence on the status of current and future work force as the labour market is being transformed globally by implementation of digital technology (Vrana, 2016). Further, a strong digital economy is vital for innovation, growth, jobs opportunities, and competitiveness thus, the spread of digital literacy is having a significant impact on the labour market and the digital literacy skills are needed in the economy and society (Barna & Epure, 2020).

A significant usage of domain related ICT applications has been seen in the textile industry in the last two decades (Lahiri, et al., 2022). The related virtual world which is embedded in technology and web interactions is called the metaverse textile technology and includes augmented technologies and virtual reality (VR) (Idrees et al., 2020). The application of VR technology is the 3D virtual body scan, commercially provided by textile companies like Size Stream, the global leader in 3D body scanning technology. Idrees et al., (2020) used this technology to provide a measurement of the human body by taking images of a person wearing a specific suit on its application. Kalbaska and Cantoni (2019) states that the digital innovations in design and manufacturing pointed out that digital communication, online reputation, and e-commerce have also influenced the textile industry.

8 Research methodology

This study is carried out in context of the global textile industry for the year 2023 - 2024. The methodology of qualitative studies illustrates the dual role of conceptual frameworks in framing questions and interpreting results (Bordage, 2009). A conceptual framework is the total, logical orientation and associations of anything and everything that forms the underlying thinking, structures,

plans and practices and implementation of the entire research project (Kivunja, 2018). The conceptual framework comprises thoughts on identification of the research topic, the problem to be investigated, the questions to be investigated, the literature to be reviewed, the theories to be applied, the methodology employed, the procedures and instruments, the data analysis and interpretation of findings, recommendations, and conclusions made (Ravitch & Riggan, 2017). Mostly, diagrams are created to clearly define the variables of the research topic and their relationships are shown using arrows.

Among the data collection methods youth employed were observation, in-depth articles related, and documentation of themes to be achieved, existing literature was consulted on the impact of digital skills on youth's empowerment for future of work. The conceptual framework is thus the umbrella term relating to all the concepts and ideas that occupy one's mind as its being contemplated, plan, implement and conclude the study (Kivunja, 2018).according to Adom et al., (2018) opine that conceptual frameworks can be 'graphical or in narrative form showing the key variables to be studied and the presumed relationships between them'. In a deductive qualitative inquiry, a conceptual framework can be used to formulate the questions and identify important variables to be analysed. In an inductive, grounded theory approach, theories are postulated de novo as the researcher analyses the data. In this study, the conceptual framework is used deductively to formulate research questions and identify important variables related to digital literacy and youth employment in the textile industry. The conceptual frameworks and critical appraisal of the literature are used post fact to interpret or contextualize the empowerment theory.

8.1 Conceptual Framework

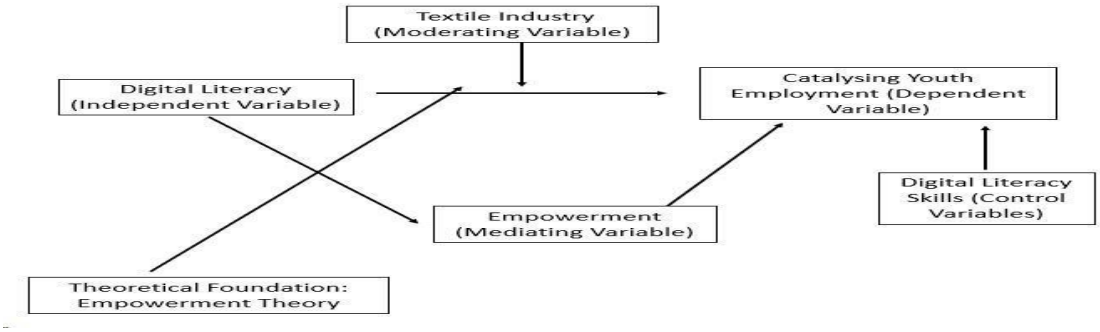

Figure 1: Visual representation of a Conceptual framework for the role of digital literacy in creating youth employment opportunities in the textile industry, South Africa.

Source: Authors illustrations

A conceptual framework in creating youth employment in the textile industry through digital literacy development. The arrows indicate a direct pathway of digital skills in the textile industry that can create youth employment opportunities in South Africa, and the interaction occurs within the textile industry in contributing to the growth though technological advancements an increased productivity.

The study drew upon the conceptual frameworks utilized in previous research, including those by Ha and Kim (2023), Deltor, Julies, Rose, and Serenko (2022), Boewnko, Kaiina, and Fedotova (2020), and Marinez-Bravo, Sadaba, Chalezquer, and Serrano-Puche (2022) explored digital literacy skills in the 21st century. The textile industry, being an engineering discipline, encompasses various facets such as design, production, and marketing of clothing materials, utilizing state-of-the-art 3D machinery.

Table 1: Conceptual Framework Methodology

Author	Year	Objectives	Country	Method	Sample	Main findings
Addison SL	2008	Examine the nature and scope of the textile component of the national skills training and employment placement programme	Ashanti Region-Ghana	Simple random sampling techniques	100 Youth	The study found that provision of technical and vocational education and training (TVET) in Ghana is shared across several government department and the ministry of education is the main provider of craft and technical institutes within the Ghanaian education service system.
Intaratat K	2021	To analyse the impact of the pandemic and technology disruption on marginal workers from selected ASEAN countries, specifically focusing on their digital literacy and skills.	Selected six ASEAN countries	The qualitative research with document study and E-interview	178 key informants	Findings reveal that the workforce scenario among marginal workers in selected ASEAN countries has been significantly impacted by the pandemic and technology disruption, leading to a notable shift of businesses from the formal to the informal sector.
Fauzi, F., Antoni, D. and Suwarni, E.	2021	Map the potential sectors based on the financial and digital literacy	The city of Palembang, Indonesia	Descriptive statistics	18 districts in the city of Palembang and the total sample used is 115 women	The results show that most businesses in Palembang are businesses engaged in the food, beverage, and tobacco industry,
Lahiri, S., Deb Roy, A. and Jana, P.	2022	Conduct exploratory research to find out the evolving constructs and variables of	China	Multivariate statistical tools	120 university students studying four years	Findings based on ANOVA analysis confirms that dimensions requiring higher-order

		digital literacy, as seen by researchers since its inception			Bachelor of Design (Fashion Design) program	cognition, such as "software management competence" and "digital citizenship competence," demonstrate an increase with progress in the graduate program.

Table 1 above shows the conceptual framework methodology, on the necessary skills needed in the textile industry and facilitates the organization by the 3D machinery that youth need to learn and be able to use in the production and designing the clothes. The application of this framework may also improve communication among youth and developers in providing diagnostic and evaluative tool for use in creating precise use-directed products. There is currently limited research focusing on digital literacy in creating youth employment opportunities in the textile industry.

9 Results and discussions

9.1 Empowerment theory

Using the empowerment theory in this model allows us to investigate the role of digital literacy in creating youth employment opportunities in the textile industry, in the case of South Africa. Digital literacy acts as a catalyst for creating youth employment opportunities among South Africans by equipping them with the skills necessary to navigate the technologically advanced landscape of the textile industry.

Digital literacy (encompassing frequency of skills, along with access, usage, and self- perception of ICTs tools, such as laptop and 3D machine for manufacturing in the textile industry) is the independent variable, and catalysing youth employment (covering income, alleviation of poverty and economic growth) is the dependent variable. The mediating variable of the study, (empowerment, which explain how digital literacy empower young people for future of works and create opportunities to be independent and drive young people to be entrepreneurs), can also act as a mechanism through which digital literacy skills influence youth employment. Additionally, a mediating variable, textile industry sector of which employ trillions of people in South Africa and require digital skills for the modern work force), is included to examine how young people differences the manufacturing in traditions way or the 3D machinery manufacturing of which require the digital skills. These variables are specifically attributed to digital literacy in the textile industry.

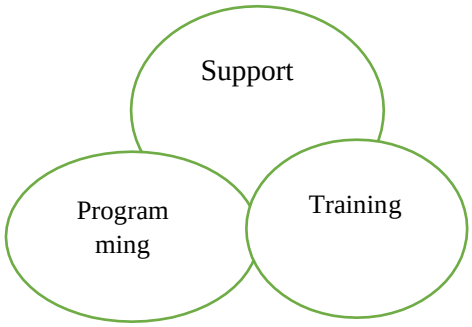

Figure 2: Empowerment model (Maran, Taliaferro & Pate, 2014)

The Empowerment Model is designed to equip young people with the "tools" (skills, knowledge, and appropriate attitudes) to promote employment opportunities (Moran et al., 2014). The proposed model has the three unique elements of programming, training, and support (see Figure 2). Even though each element plays an essential role in the success of young people, our implementation of the model indicates it is the interaction of these elements that facilitates successful job opportunities that suit the future of works and true empowerment.

9.2 Empirical Literature

The study aimed at ccessing the role of digital literacy in creating youth employment opportunities in the textile industry case of South Africa. The study finding of Velde, Kazimierczuk, Betke and Lijfering (2023), revealed that digital literacy among youth in the textile industry is a critical factor that determines their employability. Further, found a wide range of digital skills among youth in the textile industry, where some young individuals are proficient in using digital tools and platforms whilst others lack basic digital skills. Another study of Ogunyemi et al., (2022) emphasized that the broader implications of the industry 4.0 on the textile industry where the adoption of automation, data analytics, and smart manufacturing processes necessitates a digitally literate workforce. The study found a wide range of digital skills among youth in the textile industry, where some young individuals are proficient in using digital tools and platforms whilst others lack basic digital skills. This variation can be attributed to differences in access to educational resources, training opportunities, and exposure to technology.

Failing to address digital literacy skills among the youth hinders the industry's competitiveness and several key determinants of youth employment in the textile industry were identified (Manenzhe, 2018). The study emphasized the significance of TVET in preparing young individuals for employment in the textile sector; beyond formal education, prior training in textile-related skills can significantly enhance employability; access to digital resources, such as computer labs, software, and the internet, is vital for youth in the textile industry (Manenzhe, 2018). Furthermore, Atkinson and Rees, (2020); Manenzhe, (2018); Datta, Assy, Buba, Johansson, De Silva, & Watson (2018) investigated the role of vocational training programs and internships in preparing youth for employment in the textile industry and found out that these programs provide hands-on experience, mentorship, and exposure to real-world work environments, bridging the gap between theory and practice Therefore, there is a positive relationship between vocational training programs and internships in preparing the youth for future employment in the textile e industry.

10 Conclusion and Recommendations

10.1 Conclusion

The textile industry, primarily a labour-intensive sector where numerous operations, including production and quality control, are traditionally handled by human hands, is witnessing attempts to incorporate AI innovation for enhanced efficiency and effectiveness. Despite these efforts, the optimization of labour-intensive processes can be significantly improved through digital literacy skills, particularly in using information and communication technology (ICT). The textile industry grapples with challenges related to the scarcity of raw resources, hindering the sustainable supply needed to meet growing demand. Consequently, the industry requires technical breakthroughs to maximize resources, balance supply and demand, and promote sustainable production. Encouraging vocational training and apprenticeship programs within the textile industry can provide practical experience and enhance the necessary skillset. Skills training serves as a foundational step for advanced skills improvement, ultimately boosting employability. The study findings reveal a positive relationship between digital literacy and employability, influencing the association between skills and job opportunities.

Digital literacy serves as a catalyst for employability opportunities, favouring the skilled over the unskilled. The results of this study affirm the statistical significance of the connection between digital literacy and youth employability. Additionally, education on collaboration must align with cyber ethics and security to ensure that youth can collaborate with respect and remain safeguarded from cybercrime. Consequently, the scarcity of literature in this domain hampers a thorough understanding of the challenges and opportunities posed by digital literacy, impeding the development of targeted interventions and informed policies for fostering youth employment in the textile industry.

10.2 Recommendations

Policies should target both employed and unemployed youth. There is an urgent need to revisit education and training systems to ensure they adequately prepare individuals for the future of work. The 4th industrial revolution is poised to generate new jobs in the textile industry, and its positive impacts will be more pronounced for those adequately trained to understand the digital age, as opposed to those exposed solely to current education levels (Teng, Ma, Pahlevansharif & Turner, 2019). To enhance digital literacy among business actors, it is essential to start by mastering and utilizing ICT in business development operations. Developing insight among business actors is crucial to leverage digital opportunities beyond marketing, including innovation and business development. Utilizing the internet for these purposes is equally as vital as marketing. Therefore, youth require comprehensive digital education and sustainable support to ensure the business world is prepared to enter the digital ecosystem with all necessary prerequisites. Given that digital skills are undoubtedly among the skills of the future, it is crucial for stakeholders, beyond government, companies, and colleges, to endorse and support efforts promoting digital transformation for business actors.

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