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A critical analysis of Rwanda's Digital skills and entrepreneurship training toward solving youth unemployment

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Abstract

This study critically examines the role of digital skills and entrepreneurship training in addressing the persistent issue of youth unemployment in Rwanda. The paper primarily anchors on the Human Capital Theory and Entrepreneurship Theory to provide a solid theoretical framework, tying together education, skill development, and entrepreneurial activity as vital drivers of productivity, job creation, and economic development. By employing a qualitative methods approach that utilises qualitative stakeholder interviews, this research evaluates the effectiveness of the various policies and programs aimed at fostering digital and entrepreneurship skills to young people in Rwanda, to promote employment. The research unveils that these programs hold significant potential in equipping the Rwandan youth with relevant skills and nurturing an innovative and entrepreneurial culture. However, it also highlights key areas requiring attention: the lack of robust follow-up mechanisms and the need for continued support post-training. It advocates for policymakers and program implementers to prioritize these aspects to maximize their initiatives' impact. The implications of this study extend beyond Rwanda's borders as countries worldwide grapple with similar challenges. Therefore, the insights gleaned from Rwanda's approach could guide other nations in leveraging digital skills and entrepreneurship training to combat youth unemployment in the digital age. It concludes by recommending future research directions, including maintaining program relevance in the ever-evolving digital landscape and instituting more effective support mechanisms for venture sustainability.

Introduction

Just like numerous countries around the globe, Rwanda is wrestling with an issue of significant magnitude - the persistent problem of youth unemployment (Dinika, 2023; Ndagijimana et al., 2018). This issue is not confined to the realm of economics but seeps into the societal fabric, leading to worrisome consequences such as rising crime rates, increased substance abuse, and the perpetuation of poverty (Adekoya, 2020; Gacinya, 2019). The sheer scale and depth of its implications necessitate a thorough understanding of the underlying drivers and a determined exploration of effective solutions, all geared towards ensuring the socio-economic stability of Rwanda.

The digital economy, with its increasing prominence, presents a promising opportunity brimming with potential for job creation and economic growth. Fueled by technological advancements,

the Rwandan economic landscape has begun to undergo a metamorphosis, with substantial growth observed in sectors like e-commerce, mobile technology, and digital financial services (Charo & Pryce, 2022; Dinika, 2023). This digital shift offers a captivating solution to youth unemployment, sparking concerted efforts from a wide array of stakeholders (Ndubuisi et al., 2021).

Within this dynamic context, the Rwandan government, in synergy with various key stakeholders, has crafted an ambitious strategy aimed at empowering the youth with vital digital and entrepreneurial skills. With the National Information and Communication Technology (ICT) Policy and Plan (NICI Plans) forming the policy backbone, and initiatives like the Rwanda Coding Academy offering practical skills development, Rwanda is demonstrating its commitment to equipping the youth with skills that are aligned with the needs of the ever-evolving labour market (Newfarmer & Twum, 2022).

Nevertheless, a critical question looms large: How successful have these initiatives been in mitigating youth unemployment? The necessity of assessing these programs' effectiveness cannot be emphasized enough. Such assessments not only ensure these initiatives are delivering their intended outcomes but also provide valuable insights for continuous improvement.

The focus of this research, therefore, is to scrutinize Rwanda's strategy of enhancing digital skills and promoting entrepreneurship as potential antidotes to youth unemployment. Employing a qualitative methods approach - qualitative stakeholder interviews - this study sets out to examine the efficacy of these initiatives, identify any gaps, and propose actionable recommendations for boosting their impact (Chigunta, 2017; Niwemwiza, 2021; Nkusi et al., 2020).

Grounding this analysis are two key theoretical frameworks - the Human Capital Theory (Becker, 1964b) and the Entrepreneurship Theory (Schumpeter, J.A., 1934). These theories, linking education, skill development, and entrepreneurial activities to productivity, job creation, and economic growth, provide a solid foundation to understand the complex dynamics between digital skills, entrepreneurship, and youth unemployment.

The relevance of this study goes beyond Rwanda's boundaries. As many nations grapple with similar challenges, the insights gleaned from Rwanda's approach could provide invaluable lessons in leveraging digital skills and entrepreneurship training to combat youth unemployment in the digital age.

The remaining parts of this paper unfold as follows: Section 2 delves into a comprehensive review of the relevant literature. Next, Section 3 describes my methodological approach, detailing how I collected and processed the data. Section 4 brings forward my findings, revealing intriguing patterns and relationships. Section 5 then moves onto a thoughtful discussion, where I interpret the findings within the broader context of youth unemployment and digital skills development in Rwanda. Lastly, in Section 6, I distill the essence of the study into a concise conclusion, offering actionable recommendations for policy design and implementation.

Literature Review

The Global Challenge: Digital Skills Gap and Youth Unemployment

As we delve deeper into the digital era, the pressing nature of the digital skills gap continues to impact global economies profoundly (Aleksynska et al., 2021; Gunashekar et al., 2021; Verhoef et al., 2021). This gap, representing the difference between the digital abilities required in today's workforce and those prevalent among current and upcoming workers, is increasingly visible as digital technologies penetrate various facets of life and work – ranging from communication and commerce to healthcare and education (Qureshi, 2022). Consequently, the acquisition of digital competencies - the aptitude to use digital devices, applications, and networks for accessing and managing information, creating and sharing content, and fostering communication and collaboration - is now crucial (Carretero et al., 2017). This escalating trend accentuates the criticality of addressing the digital skills gap, viewed as both a social equity and economic vitality issue.

Simultaneously, youth unemployment emerges as a significant concern within the socio-economic landscape. With around one-fifth of young individuals globally not engaged in employment, education, or training (NEET), this demographic group confronts substantial barriers to socio-economic integration (ILO, 2022). Unemployment, particularly among the youth, curtails economic

growth and intensifies social inequality and exclusion, potentially causing long-term adverse effects on both individuals and societies (Denano et al., 2023; Taiwo & Aluko, 2023).

Addressing these twin challenges of the digital skills gap and youth unemployment has led to an appreciation of the potential economic contribution of young people. Considering their inherent creative and adaptive capacities, the development of digital and entrepreneurial skills among youth can significantly stimulate job creation, economic revival, and fill the digital skills gap (Abbas & Natta, 2022; Malinga, 2022; Moldoveanu et al., 2022). Furthermore, digital technologies also present opportunities to boost entrepreneurship education, equipping young individuals to emerge as successful digital entrepreneurs (Lackéus, 2015).

Countries worldwide are initiating a multitude of strategies to bridge the digital skills gap and counter youth unemployment. These include ramping up investments in digital skills education, offering mentorship and training programs, facilitating access to digital resources, and fostering entrepreneurship education. Yet, despite these efforts, the dual challenges of the digital skills gap and youth unemployment persist, thus highlighting the need for sustained research, policy interventions, and collaborative initiatives between the government, academia, and industry (Ahmed et al., 2022; Erismann et al., 2021; Larter, 2022; O'Dwyer et al., 2022; Sun & Turner, 2023).

The interrelated global challenges of the digital skills gap and youth unemployment demand comprehensive and coordinated solutions. The importance of digital and entrepreneurial skills training for the youth, as a key component in shaping our shared future, is paramount and should continue to be at the forefront of policy and practice.

Diverse Approaches: International Responses to the Digital Skills Gap and Youth Unemployment

Nations worldwide are employing diverse strategies to address the pressing concerns of the digital skills gap and youth unemployment, tailoring their solutions to their distinct socio-economic conditions and challenges. It's noteworthy that the efficacy of these efforts is not uniform and varies significantly, indicative of the complexity of these issues and the requirement for context-specific strategies (ILO, 2022).

Standout examples of proactive policy-making can be seen in countries such as Finland and South Korea. Finland has made a solid commitment to technology-oriented education since the dawn of the new millennium (Kaarakainen & Saikkonen, 2021; Kupiainen, 2022). Their holistic strategy encompasses ICT training across the educational spectrum—from primary and secondary schooling to tertiary education, and continuous professional training opportunities. This investment has cultivated a society profoundly versed in digital literacy, with their youth reaping considerable benefits in terms of employability (OECD, 2021). South Korea mirrors this commitment with significant investment in ICT training as an integral part of their education system. Their tactical approach integrates digital skills training within compulsory education, vocational training programs, and lifelong learning initiatives. This dedication has consequently led to a downturn in youth unemployment rates and an upswing in the levels of digital literacy within the populace (Choi & Park, 2021).

Conversely, there are countries where digital skills training investments have either been insufficient or inconsistent. In such contexts, the dual predicaments of the digital skills gap and youth unemployment persist, underscoring the necessity of ongoing and comprehensive initiatives to furnish the youth with digital skills (Nguyen & Tran, 2022). For instance, several developing nations grapple with offering quality and equitable access to digital education owing to infrastructural, financial, and social limitations (African Union Commission & OECD, 2021; Unwin, 2019).

Furthermore, the value of engaging multiple stakeholders in policy-making and execution cannot be overstated. Successful interventions call for a cooperative approach, involving government, education providers, industry, and civil society, ensuring that the actions undertaken are in tune with the fast-paced digital economy and the specific needs of the youth (Manyuon, 2019; Nadkarni & Prügl, 2021)

In summary, the varied international responses to the digital skills gap and youth unemployment emphasize the requirement for context-specific solutions, sustained commitment to digital skills education, and wide-ranging collaborations. Besides, these global efforts offer invaluable insights for other nations grappling with similar challenges, illuminating both successful strategies and areas warranting further enhancement.

Rwanda's Strategy: Digital and Entrepreneurial Skill Development

Rwanda is forging ahead in its mission to boost digital literacy and foster entrepreneurial skills, acknowledging their pivotal role in economic progression(Dinika, 2023). Spearheaded by the Rwandan government, this proactive strategy is anchored in policies like the National Information Communications Infrastructure (NICI) plan, and skill enhancement programs such as the Rwanda Coding Academy. These initiatives build a strong platform to equip the youth with essential skills (Charo & Pryce, 2022).

International collaborations have played a crucial role in molding Rwanda's digital framework. A significant alliance resulted in the establishment of the African branch of Carnegie Mellon University. Invited by the Rwandan government, this elite institution set up a campus in Rwanda, dedicated to 'Educating the next generation of African tech leaders and innovators" (Aiken, 2022; Dinika, 2023).

Private sector organizations have been instrumental in furthering Rwanda's vision. For instance, the Mastercard Foundation rolled out the 'Young Africa Works' initiative, which aims to enhance vocational skills and uplift the quality of secondary education, dovetailing with Rwanda's national transformation strategy (Mastercard Foundation, 2021; Roy, 2018). Rwanda's unwavering commitment to digital transformation is further highlighted through its collaboration with Huawei to set up ICT Academies. These academies aim to furnish students with up-to-date ICT knowledge and industry-relevant skills (MINICT, 2021). Along similar lines, the 'Digital and Innovation promotion project,' in association with the Japan International Cooperation Agency (JICA), is set to solidify Rwanda's stance as an ICT nerve center in Africa.

The German Agency for International Cooperation (GIZ) has also significantly contributed to Rwanda's youth development strategies. Its various initiatives, including the Digital Transformation Centre and the 'Atingi' digital learning platform, are designed to champion digital literacy, innovation, and equal learning opportunities, particularly among rural and disadvantaged communities (Dinika, 2023).

Furthermore, Rwanda's tech start-up ecosystem, facilitated by a myriad of incubators and hubs, is blossoming. These hubs provide young entrepreneurs with the requisite tools and resources to expand their enterprises (Mugabo, 2021). With ventures like the GIGA project, aimed at providing internet access to a multitude of schools, Rwanda's digital infrastructure is set to foster more inclusive participation in digital initiatives.

Theoretical Framework

The theoretical foundation of this research paper is anchored in two pivotal theories - the Human Capital Theory (HCT) as postulated by Becker, (1964) and the Entrepreneurship Theory (ET) as conceptualized by Schumpeter (1934). Together, these theories form a coherent framework that can help explain and understand the dynamics between digital skill development, entrepreneurship, and youth unemployment in Rwanda.

According to the Human Capital Theory, investing in people's education and training essentially boosts their productivity, which then results in better wages in the job market (Weiss, 2015). Becker's theory offers a convincing justification for Rwanda's plan to tackle youth unemployment, which focuses on the development of digital skills. By equipping the youth with relevant digital skills, the theory suggests that they will become more productive and desirable in the labour market, thereby decreasing youth unemployment. Moreover, the theory stresses the significance of formal education, linking it to human capital development and consequently, to earning potential (Becker, 1964a). This underscores the importance of initiatives like the Rwanda Coding Academy in promoting formal digital education.

According to Schumpeter's Entrepreneurship Theory (1934), entrepreneurs are important agents of innovation who upset the market's equilibrium by bringing in new goods, processes, markets, sources of supply, and industrial structures. In the context of this study, the theory supports the notion that encouraging young entrepreneurship might result in the creation of jobs and economic growth. According to the notion, entrepreneurial endeavors made possible by digital literacy and expertise may result in cutting-edge digital enterprises that open up new job prospects, so addressing the problem of youth unemployment.

The foundation of the theoretical framework for this study is the interaction between the entrepreneurial theory and the human capital theory. In addition to improving individual productivity, it is hypothesized that investments in digital education (HCT) can contribute to the entrepreneurial

ecosystem (ET) by supplying a competent workforce that may spur innovation and launch new enterprises. Consequently, this dual approach of enhancing digital literacy and promoting entrepreneurship could lead to a significant reduction in youth unemployment in Rwanda.

In summing up, the literature elucidates the profound global problem presented by the digital skills deficit and youth joblessness, emphasizing their far-reaching socio-economic repercussions (Johnson & Kumar, 2019; ILO, 2023). Diverse global responses to these dilemmas have been documented, with nations such as Finland and South Korea exhibiting efficacious strategies (Choi & Park, 2021; Kumpulainen & Sefton-Green, 2014). More distinct strategies, like Rwanda's proactive policymaking and collaborative initiatives, present hopeful pathways (Dinika, 2023). However, despite these invaluable insights, the literature exposes a research gap in understanding how these strategies manifest into tangible results for young people, especially in the milieu of developing nations. Moreover, there is a dearth of empirical studies scrutinizing the role of cross-sector collaboration in addressing the issues of digital skills deficit and youth joblessness (Manyuon, 2019; Nadkarni & Prügl, 2021).

The theoretical framework drawn from Becker's Human Capital Theory (1964a) and Schumpeter's Entrepreneurship Theory (1934) sets the foundation to address these gaps. It suggests that an enriched understanding of the interaction between education (digital skills) and entrepreneurship could offer new perspectives on tackling youth unemployment. Through this lens, the focus is not only on equipping individuals with digital skills (Human Capital Theory) but also on fostering an environment conducive for innovative business ideas (Entrepreneurship Theory). Hence, the existing research void necessitates a thorough exploration of these strategies and their influence on youth employment and digital proficiency outcomes. It further underscores the need for an inquiry into the dynamics of successful collaboration among different stakeholders in bridging the digital skills gap and reducing youth unemployment. In this context, understanding the application of the Human Capital and Entrepreneurship theories in the Rwandan setting becomes paramount.

Methods

For this investigation, a qualitative research approach was deployed, harnessing the power of semi-structured, in-depth interviews to uncover the nuances of the influence of digital skills and entrepreneurship training programs on youth unemployment in Rwanda (Creswell, 2009). The study was designed with a triple focus: to illuminate the viewpoints of the government, training institutions (the trainers) and the program beneficiaries (the trainees).

The study drew from a sample of 33 participants, composed of 9 individuals from diverse government departments, 7 representatives from various training institutions, and 17 trainees. The choice of training institutions and government departments was dictated by purposive sampling, a non-random sampling technique deemed appropriate given my pre-existing knowledge of the entrepreneurship ecosystem in Rwanda (Palinkas et al., 2015). This knowledge informed the selection of institutions likely to furnish the richest and most pertinent data for the study.

The trainee participants were identified through a blend of purposive sampling, referrals from training institutions, and snowball sampling. The first set of trainees were singled out through recommendations from the participating institutions—these individuals had successfully completed the training programs. From this starting point, snowball sampling took over, with the initial participants suggesting other potential participants who had likewise graduated from similar programs (Parker et al., 2019).

Data Collection

The cornerstone of data collection was in-depth, semi-structured interviews. This interview format provided the flexibility for participants to voice their perspectives in their own words while ensuring that the research's key topics were adequately addressed (DiCicco-Bloom & Crabtree, 2006). When possible, the interviews were conducted face-to-face; however, due to geographic limitations or scheduling conflicts, some interviews were carried out remotely via teleconferencing platforms such as Zoom and Microsoft Teams. Most interviews were recorded—following the procurement of participant consent—for the sake of accuracy, and then transcribed using Otter.Ai to expedite data analysis.

Data Analysis

The transcribed data underwent a thematic analysis process. This entailed coding the data, spotting patterns, and grouping these patterns into themes, with the use of both inductive and deductive reasoning throughout the process (Braun & Clarke, 2006).

Ethical Considerations

All participants were informed of the purpose of the study, the voluntary nature of their participation, and given assurances of their confidentiality. Before each interview, whether online or in-person, consent was sought, including consent to record the interviews. The participants were also made aware of their right to withdraw from the study at any point without consequences.

In summary, the qualitative research approach used in this study provided an insightful exploration into the impact of digital skills and entrepreneurship training programs on youth unemployment in Rwanda. By employing semi-structured interviews and a thoughtful mix of purposive and snowball sampling techniques, the methodology facilitated an extensive understanding of the experiences of both trainers and trainees within these initiatives. The meticulous approach to data collection, coupled with the rigorous thematic analysis of the transcribed data, has ensured a comprehensive analysis. The ethical considerations observed throughout the study further enhanced the credibility and integrity of the research. Following this, the next section will present the key findings of the study, offering insights into the participants' perceptions, the correlation between training and employment, and the broader implications of these training programs for Rwanda's youth unemployment scenario.

Results and Discussion

Within this segment, I delve into a meticulous dissection of the findings derived from my engagement with 33 participants, a diverse cohort composed of government officials, trainees and trainers involved in the digital skills and entrepreneurship training interventions in Rwanda. These participants were engaged through semi structured interviews aimed at uncovering the real impact of these programs on youth unemployment in Rwanda. The analysis of the data gave rise to the subsequent key discoveries:

Involvement and Perception of Training Program

Most trainee respondents reported participating in digital skills and entrepreneurship training programs, including entrepreneurship incubators. While sentiments towards the training were largely positive, some critical perspectives also emerged.

Most trainees had completed programs ranging from 6 months to 1 year focused on skills like programming, web development, digital marketing, and business planning. As one trainee noted, *"The training was life changing as it served as my springboard into the digital world, providing me with practical and adaptable skills."* However, another trainee felt the curriculum was too theoretical and lacked adequate practical application.

Trainees were predominantly urban youth with secondary education or above. Potential barriers for rural or less educated youth require further investigation. According to a government official, efforts by the government were underway to include youths from rural areas, the government official from the Ministry of ICT explained; *"the establishment of the Rwanda Coding Academy in Nyabihu district, a hundred kilometres from Kigali (the Capital) is a move towards focusing not only on urban youths."*

According to trainees, key outcomes included starting new ventures, gaining employment, and acquiring certifications. One trainee commented, *"The program pushed me towards entrepreneurship, before I always thought it wasn't for me".* However, a few trainees also noted lack of support after training completion. One mentioned, *"I ended up closing my business because of challenges I couldn't navigate alone"*

While sentiments were largely positive, the potential for response bias should be considered given trainees self-selected into these programs. Understanding perspectives from non-participants could provide more balance. Critical analysis is required to substantiate claims of transformational impact made by some trainees.

Skills acquisition and relevance

The training programs were aimed to provide both technical and business skills. However, some trainees felt the curriculum lacked sufficient focus on soft skills like communication, critical thinking,

and project management, which conflicted with findings from incubation hubs such as Westerwelle Startup Haus which claimed to also focus on soft skills. A few trainees also noted gaps in emerging digital areas like data analytics and AI limiting relevance. While in existence, institutions offering training in Machine Learning skills relevant for AI were limited.

While trainees largely perceived the skills taught as relevant, measuring actual competency development and alignment with employer needs requires evaluation. One trainee reflected that applying the skills was still difficult despite training.

With the pace of digital transformation, maintaining relevance necessitates regular industry consultation and curriculum updates by training providers. But processes for responsive curriculum design are unclear.

Potential misalignment between skills supplied and practical application underscores the need to complement technical content with hands-on learning and post-training guidance. Anecdotes about ventures launched were reported, however they cannot alone demonstrate impact or relevance. Systematic outcome data is critically needed to corroborate these.

Outcomes Post-training and Employment Status

Trainees reported varied outcomes after completing the training programs. While some gained employment, several mentioned launching new ventures in areas like digital marketing and IT services. As one trainee stated: *"The training acted as a catalyst that pushed me into becoming an entrepreneur. Before the training I was looking for a job, but right now I am the CEO of a digital marketing and training firm".*

However, the data on specific employment and entrepreneurship outcomes is based entirely on self-reports. While such anecdotes highlight the potential of these programs, quantifying the impact requires longitudinal tracking of objective outcomes. Details like the proportion entering wage employment vs entrepreneurship, time taken to find jobs, sectors employed in, and sustainability of ventures started are unavailable.

Claims about stimulating job creation and entrepreneurship lack evidence without systematic data on career trajectories across cohorts of trainees over time. Measuring indicators like employment rates, income levels, and business growth pre- and post-training participation is critical to substantive impact evaluation.

Correlation between training and occupation

The respondents highlighted a strong correlation between the training they underwent and their current occupations. Those gainfully employed validated that their jobs were directly tied to their training. In a similar vein, entrepreneurs acknowledged that their business concepts were a product of the skills and knowledge garnered during the training. An employed respondent elaborated, "My current job directly utilizes the skills I acquired from the training, demonstrating a strong link between the training and my employment." However some respondents revealed that they had failed to find jobs in the stated fields, with one revealing that he was now into poultry farming, instead of digital marketing where he had received training.

Support Frameworks Post-training

Additional assistance beyond the training was reported as being absent by a significant number of respondents. They expressed that they would have appreciated continued support as sometimes they came upon problems with they struggled to navigate. A few trainees who were not working in jobs they had trained for identified this as the main reason. One trainee noted, "I think the programs need to do better in terms of how they treat us after graduation. I had the skills yes, but running a business was a big challenge and I ended up closing the business and now I'm doing something different."

Engagement of Trainer and Evaluation of Program

From the trainers' perspective, the majority indicated a deficit of follow-up initiatives for their graduates, resulting in a scarcity of clear evaluation statistics. However, they still viewed their programs as successful in accomplishing their objectives, specifically enhancing digital literacy, cultivating a culture of innovation, and sparking job creation among Rwandan youth. One trainer insightfully observed, "We've made considerable strides in fostering digital literacy and entrepreneurship despite the challenges we face, particularly in tracking and evaluating our graduates' progress."

Building on these findings, the subsequent section of this study will embark on a detailed analysis and interpretation of the data. The focus will be to extract further insights and unearth the

deeper implications of the findings within the broader context of Rwanda's digital skills and entrepreneurship training initiatives. I will scrutinize these discoveries, placing them under the lens of prevailing theory and practice, and articulate their relevance to the goal of addressing youth unemployment. This interpretive journey is intended to lend a deeper, more nuanced understanding of the findings and their role in informing policy decisions, program improvements, and future research directions.

Discussion

The subsequent section aims to examine and critique the research findings in the broader context of the prevailing discourse on entrepreneurship and digital skills training and the implications it holds for the youth unemployment predicament in Rwanda.

The Relevance of Instructional Programmes

A common thread running through the findings was the significance of the skills attained and their impact on the career trajectories of the trainees. This relevance resonates with the extant literature that underscores the critical role of vocational training programmes, specifically those focused on digital skills and entrepreneurship, in youth employment. As articulated by one of the respondents, "These programmes deliver an intensive, yet comprehensive, learning approach, which equips us with skills that are on demand in the digital economy."

However, the Human Capital Theory's premise that training boosts productivity was not uniformly evident, given some trainees' difficulty applying skills. Concrete evaluation using HCT metrics like income levels and competency rubrics is required to substantiate relevance beyond positive self-reports prone to bias. Variability in career progression also warrants scrutiny through longitudinal tracking, rather than claims of accelerated trajectories based on anecdotes.

While adaptability is envisioned by HCT and Entrepreneurship Theory (Becker, 1964a; Schumpeter, J.A., 1934) , curriculum rigidity indicates responsiveness to market demands is lagging. This sentiment mirrors assertions by Bessen, (2015) and Spitz-Oener et al. (2006) that digital skills training must continuously adapt to meet the evolving demands of the digital economy. Hence, training institutions need to ensure they remain abreast of industry trends, technological advancements, and market demands, thereby providing trainees with the most pertinent and valuable skill set. The findings, therefore, point towards a dual necessity: the continuation and expansion of such training programmes and their continuous evolution in line with the ever-fluctuating dynamics of the digital realm.

The findings illuminate the critical role played by support systems, particularly financial assistance and other resources, in fostering youth entrepreneurship. This narrative mirrors the existing literature, such as the study by Martin et al., (2013) which emphasizes the importance of access to capital and resources in the establishment and growth of new ventures. Nonetheless, the findings also disclose disparities and inconsistencies in the provision of such support. While some participants benefitted from substantial assistance – an entrepreneur vividly recalled, "The continued support from the Incubation hub, including free use of tools like the 3D printer, I could never afford on my own was really was really instrumental during my business's initial stages," – others narrated a different reality, indicating that this support is far from universal.

Such inconsistencies indicate a significant gap in Rwanda's entrepreneurship ecosystem that threatens the sustainability of ventures initiated by the trainees. Despite the evident potential of entrepreneurship training programmes to stimulate job creation, the absence of consistent and accessible support mechanisms could severely restrict the realization of this potential. Therefore, addressing this gap becomes a crucial task for stakeholders within the ecosystem, including government agencies, training providers, and financial institutions.

In tandem, the impact of the training programmes on the entrepreneurial ventures of the trainees is another key finding. All the entrepreneurial respondents concurred on the significant influence the training had on their businesses. This consensus validates the existing literature, such as Peterman & Kennedy, (2003) which emphasises the positive influence of entrepreneurial education on venture creation. As articulated by one entrepreneur, "The knowledge and skills acquired from the training was really important for me. Initially I thought I wasn't made to be an entrepreneur, but here I am."

However, while this consensus points towards a positive trend, it also calls for further examination. Gaining insight into the specific nature of this impact, how it manifests in different business contexts, and its evolution over time could provide valuable knowledge for the development of more effective and impactful training programmes. Furthermore, it raises questions about how this

impact can be amplified or leveraged to stimulate further job creation, contributing to the larger goal of addressing youth unemployment. Hence, while the findings underscore the importance of support systems and the impact of training programmes, they also highlight the need for additional research and policy interventions in these areas.

Programme Evaluation and Follow-Up Mechanisms

A salient issue that surfaced from the findings is the dearth of robust follow-up mechanisms and systematic evaluation in digital skills and entrepreneurship training programmes, a sentiment shared by most trainers who participated in this study. From the government side, this lack of follow up and evaluation was also prominent, for example information on how many young people had opened businesses to offer access to the IREMBO platform (a digital platform to access several government services such as birth registration, tax payment, business registration etc.)

This absence of follow-up and evaluation mechanisms is not unique to Rwanda's context but is, regrettably, a global trend, especially in interventions targeting youth employment, as highlighted by Kluve, (2016) and Kluve et al., (2019). The lack of such mechanisms impairs the capacity of training providers and policymakers to fully comprehend the long-term impact of the programmes on the career trajectories of the trainees and their contribution to the broader objective of reducing youth unemployment.

Furthermore, the absence of systematic evaluation could limit the potential for programme improvement and innovation. As evidenced in other fields, feedback and monitoring are essential elements contributing to continuous learning and improvement. They enable providers to identify and address programme weaknesses, tailor training to better meet trainees' needs, and track changes in skill demand in the job market. As confessed by one trainer, "Our lack of clear evaluation statistics hampers our capacity to pinpoint areas for improvement and accurately measure our impact."

Addressing this gap in programme delivery and evaluation, therefore, becomes an imperative task. Implementing robust follow-up initiatives and rigorous evaluation mechanisms could not only enhance programme quality and effectiveness but also yield valuable insights into the long-term effects of these training programmes on trainees' employment and entrepreneurship outcomes. This, in turn, could inform policy decisions, guide the allocation of resources, and ultimately contribute to more effective strategies to tackle youth unemployment in Rwanda.

Conclusion

This study utilized qualitative interviews to explore the impact of digital skills and entrepreneurship training programmes on youth unemployment in Rwanda. The findings reveal that these interventions equip young people with technical abilities and an enterprising mindset that enhances their employability and job creation potential. However, the lack of robust monitoring systems and sustained support beyond training hampers long-term outcomes.

Drawing on Human Capital and Entrepreneurship theories, the paper argues for maximizing the impact of these initiatives through targeted improvements. The study makes important empirical contributions by elucidating the perspectives of diverse stakeholders within the skills training ecosystem. It highlights the ongoing relevance of the training content and the strong correlation between skills acquired and subsequent employment or venture creation.

At the same time, significant gaps exist in follow-up support and evaluation to track graduate outcomes. Addressing these limitations can enhance programme effectiveness and policymaking. Based on the evidence, the study recommends:

- Dedicated financing mechanisms like youth enterprise funds and partnerships with financial institutions to provide start-up capital and ongoing access to credit.
- Tax incentives and infrastructure to encourage tech companies to recruit and shape curriculum.
- Increased investment in training institutes that incorporate monitoring, evaluation and career guidance.
- Industry-aligned skills certifications, discounted internet access, and online portals for continued mentorship.
- Regular graduate surveys and adaptable curriculum attuned to changing technologies and market needs.

- Experienced entrepreneur-led coaching and collaborative training hubs across academia, industry and government.

By implementing these specific policy actions, Rwanda can maximize its efforts to develop a digitally empowered youth population that continues to be an innovative entrepreneurial force. This will provide scalable solutions to the urgent challenge of youth unemployment.

The implications of the study extend beyond Rwanda's borders. As countries worldwide grapple with similar challenges, the insights gleaned from Rwanda's approach could provide valuable lessons in leveraging digital skills and entrepreneurship training as a means of combatting youth unemployment in the digital era. Consequently, the study contributes not only to the broader discourse on youth unemployment and digital skills but also to the understanding of how these issues can be addressed in the context of developing countries.

While this study provides important qualitative insights, it has some limitations that open up avenues for future research. The small sample size of 33 participants from one geographic region limits generalizability of the findings. A larger nation-wide survey can generate more representative results. The qualitative nature makes it difficult to quantify outcomes like employment rates, income levels and skill proficiencies.

Follow-up studies should incorporate a longitudinal mixed-methods approach tracking trainees over time. This can provide robust data on employment status, venture sustainability, incomes and digital literacy metrics. Comparison groups can help account for external factors affecting outcomes. Partnering with training institutes to access participant records can facilitate long-term assessment.

Comparative analyses across emerging economies implementing similar interventions can also identify best practices in curriculum design, public-private partnerships, financing mechanisms and support systems. Further research could isolate the most impactful components through multivariate regression modelling. Cost-benefit analyses can quantify returns on government investment in these programmes.

There is scope for innovative experiments like randomized control trials to evaluate programme effectiveness. Future studies can build on this exploratory research by adopting more rigorous designs at scale. Techniques like machine learning and predictive analytics can also help forecast the impact of policy changes.

In conclusion, the research highlights the importance of digital skills and entrepreneurship training as key strategies in mitigating youth unemployment in Rwanda. By pointing out key areas for improvement and future research, the study hopes to guide further efforts in harnessing the full potential of the youth in the digital economy.

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Declaration of Interest

The author declares no conflict of interest

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