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Riding on Digital Transformation to increase the Women and Youth employment in the post-COVID-19 Era – A Study on Zimbabwe

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ABSTRACT

Purpose: The main purpose of this paper is to shed a light on the employment-to-population ratio of women in Africa continues to trail behind men, despite a gradual increase in their participation in the paid labour force. This discrepancy can be attributed to historical factors during previous industrial revolutions, where women were excluded from the labour force due to the focus on labour-intensive mass production, and their prioritization of family commitments. However, with the rise of technology and cyber-physical systems in subsequent industrial revolutions, more women have started engaging in paid employment. The work-from-home concept, highlighted during the Covid-19 pandemic, showcased the feasibility of remote work arrangements, providing an opportunity for African policymakers to empower women and youth by revisiting their policies. **Methodology:** This study was conducted on this context to discover a practical knowledge on the digital transformation of the women and youth with a major focus on the Zimbabwean context. To achieve this objective, an empirical review of previous works of literature on digital transformation and work from home was conducted. The study based on the thematic analysis of the data obtained from literature review. To support our research objectives, we conducted a thorough literature search using thematic analysis and developed a skills framework. **Implications:** Exploring the work-from-home concept, we aim to provide a comprehensive framework outlining the necessary skills for the upcoming fifth industrial revolution, which demands a workforce capable of effectively interacting with technological devices. **Originality:** This paper contributes as an intellectual hub; universities can use the framework to design courses empowering marginalized groups, especially women, aligning with national policies for inclusive economic growth and societal development in a post-Covid-19 world.

Keywords: *Women employment, Fifth industrial revolution, Skills Framework, Work-from-home*

INTRODUCTION:

The concept of work from home (WFH) gained momentum during the COVID-19 pandemic when almost everyone was forced to work from home. Research shows that remote working is not a new concept, it began in the early 1990s as a concept called teleworking. However, during the COVID-19 pandemic it became necessary (Irawanto et al., 2021). The concept is linked to advances in technology and digital transformation and because many organisations have been slow in adopting technology in their operations, they were caught off guard during the COVID-19 pandemic (Savić, 2020; Rena and Mbukanma, 2023). This sent shock waves to managers resulting in the accelerated adoption of digital technologies (Snyder & Barnakova, 2020). Interestingly, this revelation has prompted employers worldwide to recognise the possibility of leveraging skills from any location while maintaining a consistent level of output in specific domains. However there has been slow uptake of the WFH concept by managers, particularly those in Zimbabwe, who seem to have maintained the status quo after the pandemic. This is contrary to what is happening in countries abroad where there is now an increase in recruitment in the WFH space (Aksoy et al., 2022).

The work from home concept has the potential to increase employment for women in the paid labour force, where their employment-to-population ratio in Africa still lags behind that of their male counterparts (Rena and Mbukanma, 2023). The major contributing factor to this has been the key drivers and focus areas of the previous industrial revolutions. The first industrial revolution was driven by steam and water and women were not considered in this revolution because the focus was on mass production using labour intensive processes. During this period, women often prioritized family commitments and were less inclined to pursue paid employment or seek opportunities abroad due to family commitments.

As the key drivers shifted towards technology and cyber-physical systems it coincided with a significant increase in the proportion of women in paid employment. We are now heading towards the Fifth industrial revolution and Africa has been left behind in all the past four revolutions (Ndung & Signé, 2018). This now creates an opportunity to empower Zimbabwean women in the work-from-home space. It is also time for Africa to take a lead by riding on this digital transformation wave to empower its vulnerable group of unemployed women and youth. This presents a huge opportunity for Zimbabwean policy makers to take a lead, this time around, by revisiting their policies so that they become the leaders of this fifth industrial revolution. The percentage of individuals in economically disadvantaged countries, who have the opportunity to work remotely from home, is 22%, which is significantly lower than the 37% observed in developed countries (Gottlieb, Grobovšek, & Poschke, 2020).

Zimbabwean universities and colleges have been producing graduates with skills needed in many countries and the country has relied on income from the diaspora to develop and sustain its economy. Universities as the thinking spaces for society could use the framework emerging from this paper to develop courses and syllabi that provide skills required in the work from home concept to empower youth, and women who have remained home so that they also add to the pool of those remitting income from abroad. The WFH will also give women an opportunity to be closer to their families while still being gainfully employed.

Many existing studies on the WFH concept focus on its pros and cons for local industries, neglecting the potential for locals to utilise their skills for earning foreign exchange. This paper aims to investigate the WFH concept and propose a lifelong learning framework for local universities to impart the necessary and constantly evolving technological skills. By exploring this framework, we can better equip individuals with the skills needed to thrive in the dynamic world of technology.

PROBLEM STATEMENT:

We are currently entering the era of the fifth industrial revolution, which necessitates the development of new skills to complement existing ones. This is crucial as it aims to establish a closer connection between humans and machines. Historically, women have faced challenges in catching up during previous industrial revolutions (Kanjere, 2020). During the 2019 World Economic Forum, it was highlighted that women are falling behind in acquiring the critical skills required for future job roles (Duke & Berger, 2019). The issue at hand pertains to how Zimbabwean universities can equip both current working women and future female students with the necessary skills to enable them to effectively work from home in the fifth industrial revolution, thereby avoiding the repetition of past instances where women have been marginalized. Without taking proactive measures, the new environment is likely to exacerbate the existing disparities and potentially reverse the progress made in empowering women thus far.

RESEARCH OBJECTIVES:

(1) To analyse the jobs that suit the work from home concept and the set of skills required to adopt this concept in the fifth industrial revolution.
(2) To establish ways of imparting skills to the current crop of working women and those yet to join institutions of higher learning.
(3) To develop a suitable framework that can be used by universities to impart the required skills.

RESEARCH QUESTIONS:

(1) Which jobs suit the work from home concept?
(2) What set of skills are required by women to survive in the upcoming 5th industrial revolution and use them in the work from home concept.
(3) What framework can be used by institutions of higher learning such as universities to continuously impart skills to women in the world of ever changing technology.

LITERATURE REVIEW:

Two theories were used as theoretical lenses to investigate this problem (i) the skills acquisition theory and (ii) the human capital theory. The skills acquisition theory accounts for how people progress in learning a variety of skills, from initial learning to advanced proficiency. It includes both cognitive and psychomotor skills studied in domains that range from classroom learning to applications in sport and industry (DeKeyser, 2014). This theory was a perfect fit in assessing how skills have been acquired in an environment where technology has also been advancing. The human capital theory initially formulated by Becker (1962) and Rosen (1976) cited in (Strober, 1990, p. 1) assumes that education increases skills and these in turn increase productivity which then increases earnings. Therefore, individual workers have a set of skills or abilities which they can improve or accumulate through training and education by investing in education, and this in turn will increase individual capital.

Although the theory in question has faced criticism regarding its lack of recognition as a production factor in the field of economics (Kolomiiets and Petrushenko, 2017), Strober (1990) argues that it provides valuable insight into the connection between education and earnings. In the context of this paper, this perspective proved valuable as our aim was to identify the essential skills required for the WFH concept, which not only enable individuals to earn a livelihood but also contribute to lifelong learning and foreign income flows for the country.

CONCEPTUAL FRAMEWORK:

Technology ushered us into the fourth industrial revolution. While it took hundreds of years between the first and third industrial revolutions the transition between the fourth and fifth was less than fifteen years (Mourtzis, 2021). The term industry 4.0 was coined in 2011 at an industrial fair in Hanover in German (Khan et al., 2017).

Industry 5.0 is emerging while Industry 4.0 is still in the process of reaching its full potential. However, it is crucial to understand that Industry 5.0 "*is more than just ramped up automation*" (Østergaard, 2017). The following figure summarises the transitions between the industrial revolutions and why humans are being compelled to embrace technology and the sudden increase in the WFH concept.

Figure 1 illustrates that three key things happened at the same time during the transition from fourth into the fifth industrial revolution, (i) Technology advanced at a faster rate than what humans could cope with, making current skills almost irrelevant. (ii) As humans were pondering on ways to adopt technologies at a very slow pace, and COVID-19 forced them to stay at home resulting in forced accelerated haphazard adoptions of technologies (Rena and Mbukanma, 2023). People were forced to learn new skills, like using Zoom, Microsoft Teams, for meetings and many other emerging technologies (iii) The WFH concept was introduced, and this opened the eyes for employers as they realised that they can still achieve the same level of output from certain jobs when people are working from home. Remote working is now gaining momentum as we also move into the fifth industrial revolution. This is likely to affect more women than man because they are already lagging (World Economic Forum, 2019).

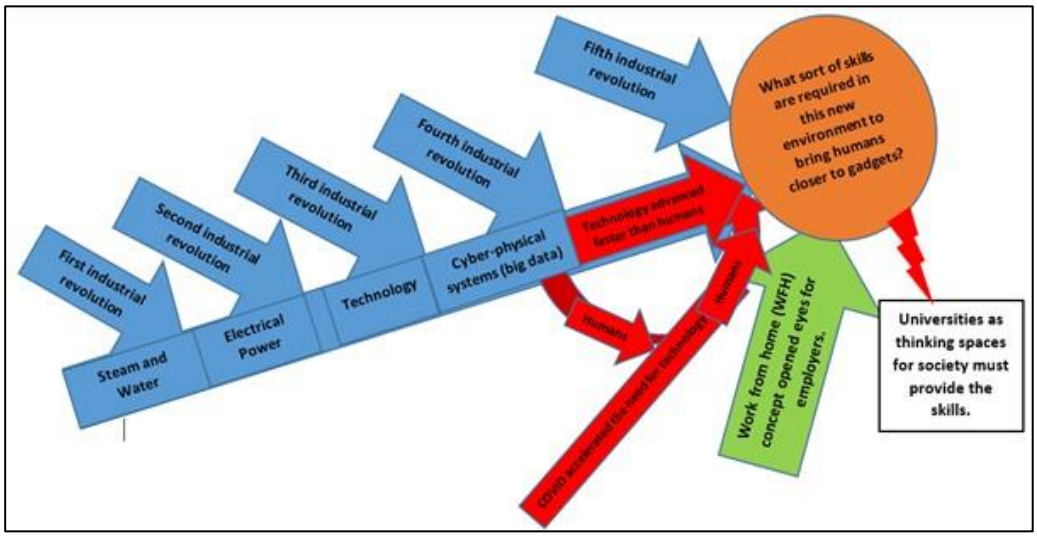


Figure 1: Transitioning from the fourth to the fifth industrial revolution accelerates the demand for technological skills.

Source: Own formulation.

METHODOLOGY:

The literature search was conducted through Google Scholar branching to other academic databases such as Elsevier. The targeted timeline was from 2019 to 2023, however some of them referred us to some previous and other seminal works relevant to this paper. The first phase of the search was conducted using the following key words; work from concept; to get an understanding of the concept. This led us to other terms like, fifth industrial revolution, teleworking, nomad visa. The other key phrases that were used on search engines were Teleworking and creation of employment, how many jobs can be done at home, women in employment in Africa, Benefits, and challenges of working remotely, which professions suits remote work, Skills needed in the work from home in the fifth industrial revolution. This research aimed to explore the evolution of the work-from-home concept across the four previous industrial revolutions and examine its relevance in the context of the upcoming fifth industrial revolution.

ANALYSIS AND DISCUSSION OF FINDINGS:

The analysis and discussion of findings in this study examine the work-from-home (WFH) concept in the context of the fifth industrial revolution. It starts by identifying the specific jobs and skills required in the WFH environment. This leads to the exploration of the conceptual framework, the current situation, and the ongoing debate surrounding the methods employed to impart the rapidly evolving technological skills. These elements serve as the foundation upon which the framework proposed in this study is developed.

The work-from-home concept:

According to (Sanchez et al., 2021), globally one in every 5 jobs can now be performed from home. However, as we move to low-income countries the figure drops to one in every 26 jobs due to poverty, lack of skills and lack of adequate internet connections. Given this context, an important question arises: which of these occupations can be performed remotely? This could potentially enable Zimbabwean policymakers to gain insights and take measures to empower women as a vulnerable group in society who have traditionally chosen to stay home and care for their families while their male counterparts seek employment abroad.

A search was conducted until saturation was reached and various authors listed the following, almost similar, top five professions/sectors and associated jobs that can be done remotely.

Table 1: Jobs that can be done remotely

Document name	List of top five professions that can be done remotely	Reference
What's next for remote work: An analysis of 2,000 tasks, 800 jobs, and nine countries	1. Finance and insurance. 2. Management. 3. Professional scientific and technical services. 4. IT and telecommunications. 5. Education	McKinsey Global Institute (Madgavkar et al., 2020)
How many jobs can be done at home?	1. Education services 2. Professional scientific and technical services. 3. Management of companies and enterprises 4. Finance and insurance 5. Information analysis	(Dingel & Neiman, 2020)
Covid Economics, Vetted and Real-Time Papers: Supply and demand shocks in the COVID-19 pandemic an industry and occupation perspective	1. Education, training, and Library 2. Computer and mathematics 3. Business and financial operations 4. Sales 5. Management, architecture, and engineering	(Rio-Chanona et al., 2020)
Jobs' amenability to working from home Evidence from skills surveys for 53 countries	1. Information and Communication technology 2. Professional activities 3. Finance and insurance activities 4. Real estate activities 5. Public administration	(Maho et al., 2020)
Working from home across countries	1. Managers 2. Professionals 3. Technicians and Associate Professionals 4. Clerical Support Workers 5. Services and Sales Workers	(Gottlieb et al., 2020)

Source: Own formulation by authors.

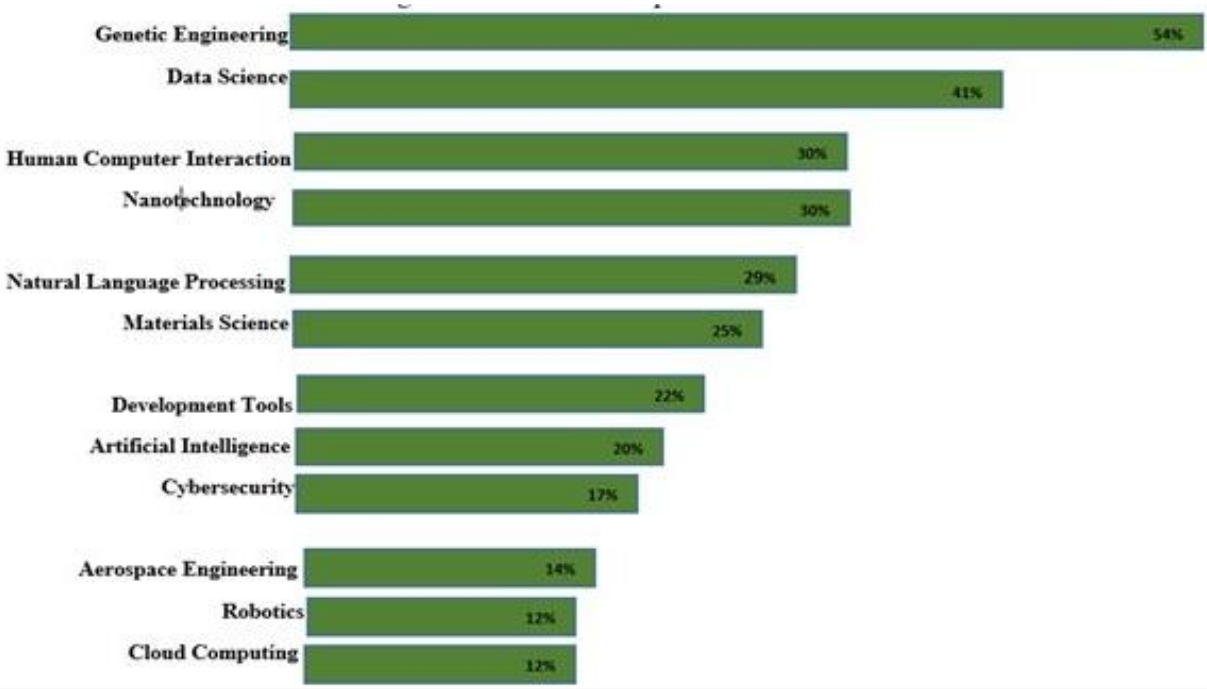
The World Bank classifies the jobs that has potential to be done remotely as complex problem-solving jobs and intensive tasks that require critical thinking and cognitive skills found in advanced-skilled labour that can be done effectively using new technologies (WorldBank, 2019). For example, jobs like business analysts, various forms of consulting and professional jobs that do not require physical presence. These suit people who carry out non-routine tasks like high-skilled jobs, problem-solving and complex communication activities, unlike most manufacturing jobs that require physical presence (Sanchez et al., 2021; Rena and Mbukanma, 2023). Other jobs that qualify are jobs that require updating knowledge and learning, interacting with computers, programming, thinking creatively, communicating and guiding clients, processing, analysing and interpreting information, monitoring market conditions and trends, (Madgavkar et al., 2020).

Currently, it is evident that only a limited number of jobs can be conducted remotely due to the considerable amount of work that remains to be done. For example policy makers must first target the removal of barriers to the adoption of digital practices in the workplace (Crescenzi et al., 2022). One important thing to note is that, there is a strong correlation between high-skilled labour and the usage of computers (Sanchez et al., 2021). Therefore, remote jobs are hinged on use of technology.

Lack of skills to keep pace with emerging technologies:

According to the World Economic Forum (2019) the percentage of women with disruptive tech skills lag behind, that of man.

Figure 2: Percentage of women with disruptive tech skills



Source: (World Economic Forum, 2019)

There are fewer women in technical fields such as Artificial Intelligence, Data science, Cybersecurity, Robotics and cloud computing. The digital revolution that is taking place poses a risk to existing patterns of gender inequalities (Wajcman et al., 2020). If nothing is done to upskill women right now the position will be worse in the fifth industrial revolution. This will also erode all the gains made in the previous industrial revolutions and reduce their chances of being employed in the emerging WFH space.

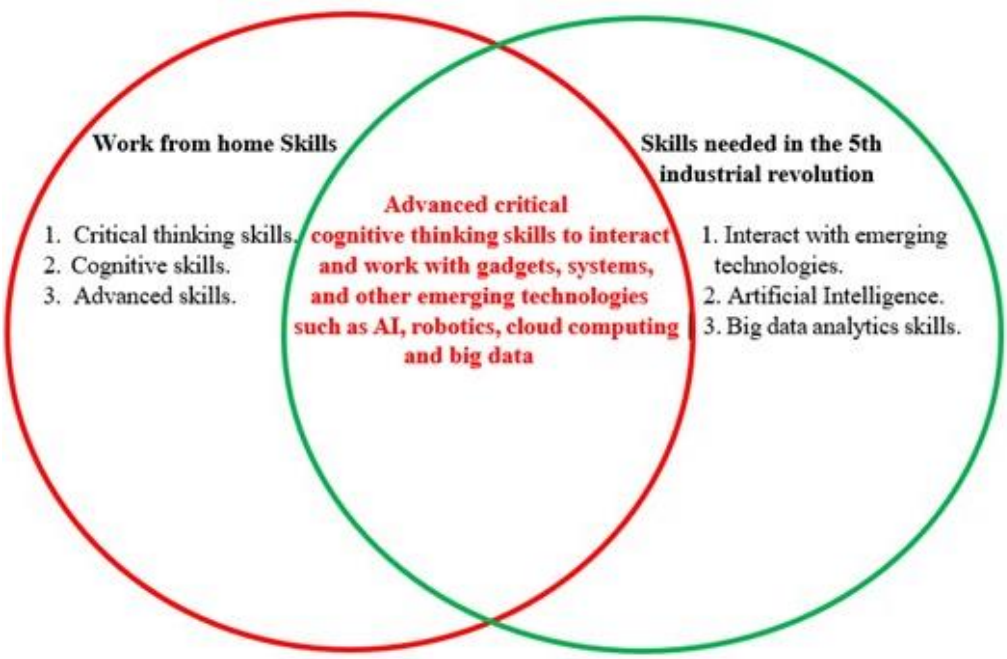
This work-from-home concept is hinged on the existence of technology. Without technology the concept would not exist. Therefore, it will be hard for women to break the trend and succeed, in this emerging technology labour market, without imparting relevant digital skills and also intervening socially, politically and economically (Wajcman et al., 2020). There is a need to come up with a sustainable framework to continuously train those women already, in the job and those yet to join institutions of higher learning because technology will never stop changing. The new environment is dominated by emerging technologies such as artificial intelligence, robotics, cloud computing, and big data. For example, Walmart currently uses technology in their supply chain management (Winata & Ellitan, 2023). They are using artificial intelligence to negotiate prices with suppliers (Tobin, 2023). This means such an organisation can employ people to work remotely. However, it is near impossible for a woman in a developing country like Zimbabwe to look for employment in such an organisation without up-skilling and having access to the required facilitating conditions such as electricity, network, and computers.

Policy makers and universities as thinking spaces of society, should take the lead to provide the required resources and impart the necessary skills needed to adopt the WFH concept as we enter the fifth industrial revolution. The following skills are needed in the new environment.

What the world currently faces is a situation where technologies continue to emerge and advance, and in the process new skills also emerge. The question to ask is: where should these new skills be learnt? Should they be learnt from the workplace, or from the companies that develop these tools, or from the universities? In the jobs that can be done remotely the following sectors topped the list, finance, and insurance, management, consulting, education, professional services, and Information technology. In figure 3 it emerged that for someone to work remotely in the fifth industrial revolution he/she must have advanced critical thinking skills to interact and work with digital gadgets, systems, and other emerging technologies such as AI, virtual meetings, robotics, cloud computing, big data and many more. Geography teachers in Zimbabwe have recognised the challenges of utilizing specialized software such as QGIS, ArcGIS, and

Thuban without proper training, highlighting the continuous need to upskill teachers to keep pace with evolving technology (Firomumwe & Gamira, 2021). During the COVID-19 pandemic, many employees from the traditionalist generation in Zimbabwe struggled to interact with technology while working from home, lacking even basic computer skills (Mabika, 2021). Additionally, teachers and students faced difficulties in using information communication technology (ICT) devices and attending online lessons due to insufficient skills, power outages, connectivity issues, and high costs of network bundles (Konyana & Motalenyane, 2022). To successfully embrace the WFH concept in the context of the fifth industrial revolution, institutions of higher learning must invest in necessary infrastructure and provide lecturers and students with the essential skills to overcome these barriers (Nyika & Modise, 2022).

Figure 3: Skills needed in the new work-from-home concept



Source: Own formulation by authors

Ongoing debate on adopting micro-credentials as a way of imparting new emerging skills:

Micro-credentials (MC) "*are a digital form of certification indicating that a person has demonstrated competency in a specific skill*" (Szalma and Zarka, 2018, p.5). They originated from a movement termed digital badge that aimed to support adult learning for the workforce. The earliest was funded by the MacArthur Foundation in 2013 (DeMonte, 2017). The COVID-19 outbreak has changed the education landscape worldwide and many universities around the globe are now offering these MC certifications, particularly those in western countries. The question to ask is: do employers both (local and international) recognise skills and competences gained through these MC (Hidayah et al., 2021)?

The demands of the new environment requires knowledge and skills to be updated constantly to an extent that a four-year degree program alone may not suit the current emerging job requirements (Selvaratnam & Sankey, 2021). Oliver, (2019) suggested that universities and other private providers should consider revisiting their curricula and courses and partner with employers to introduce micro-credentials in higher education to overcome this challenge.

In contrast, Wheelahan and Moodie (2021) contend that micro-credentials introduce the concept of employability skills within the framework of human capital theory, which can undermine the categorization and framing of knowledge. Conversely, the demand for essential digital competencies is growing, enhancing the employability prospects of job seekers in the labor market. However, there is a lack of widespread digital literacy among the general population, necessitating comprehensive education in these skills (Bieber, 2019).If we continue to ignore these emerging micro-credentials and the way technology is advancing, it is possible that the trend will be further entrenched, and the traditional delivery and quality assurance regimes in education will be overtaken and left behind in the process (Keevy et al., 2021). In her

framework "*The micro-credential learner value framework*" Beverly Oliver posed questions about micro-credentials that can be used as the basis of crafting a framework (Oliver, 2021, p. 4).

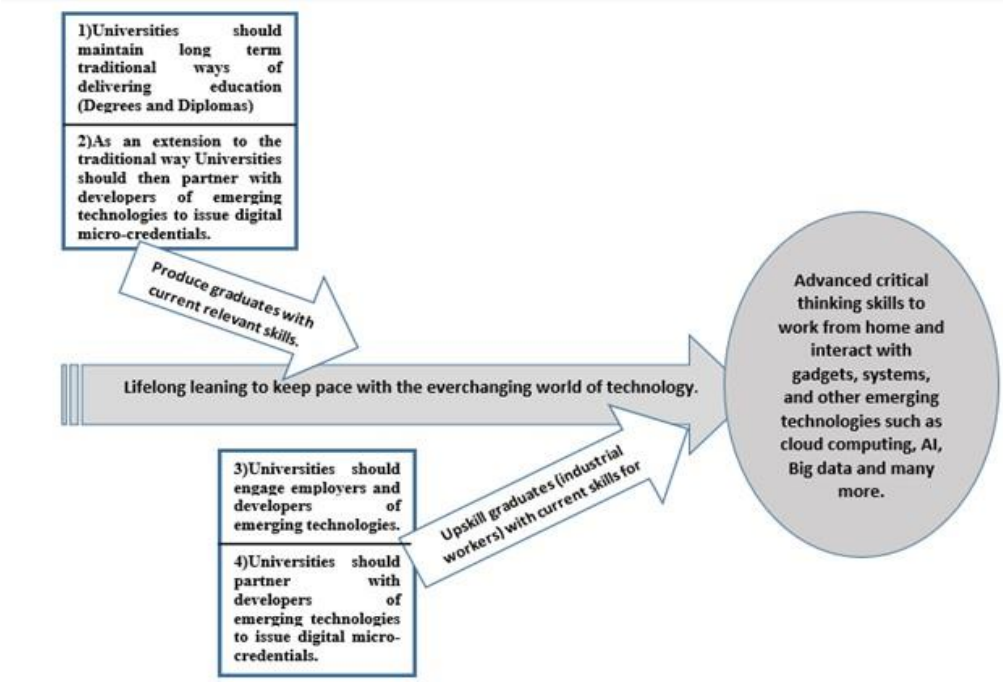
Though micro-credentials can cover many fields, the focus in this paper was on micro-credentials to learn emerging technologies. We posit that what is facing the world today is a situation where technologies continue to emerge and advance, and in the process new skills needed in the WFH concept also emerge. Public universities need to embrace the MC initiative as fast as possible as it is the only way more vulnerable groups who are financially stretched can access them. Private universities are inaccessible for most of the population. Therefore, public universities cannot continue to ignore micro-credentials and surrender them to be issued by employers and other private players. Micro-credentials issued by employers may not be recognised internationally to allow Zimbabwean women as vulnerable members of the society to be employed remotely by companies from abroad.

To mitigate discussions on employability and challenge the categorization of knowledge, it is imperative to introduce micro-credentials as complementary qualifications alongside traditional long-term degrees and diplomas. This approach will not only foster lifelong learning but also facilitate the acquisition of new skills to keep pace with technological advancements. Consequently, universities must review their policies and practices to ensure the development of relevant skills and competencies for learners (Kanwar & Mays, 2019).

Proposed Framework:

The following sustainable framework can be used in the current environment to impart current and future emerging skills to empower women to work from home and for them to remain competitive in the ever changing world of technology.

Figure 4: Lifelong learning framework to keep pace with ever changing technology



Source: Own formulation

There is no doubt that technology drives the WFH concept. 1. The first step of the lifelong learning framework in Figure 4 above is to ensure that the conventional way of delivering education is not disrupted. 2. The second step is to offer micro credentials to those, already on four-year degree programs because syllabi for the conventional degrees and diplomas take time to change. 3. There is a need to engage industry and the developers of emerging technologies to always remain abreast of developments and usage of these technologies. 4. Finally universities should then partner with developers of these emerging technologies to develop appropriate short-term syllabi to impart the required skills. This approach can serve as a post-Covid-19 response aligned with national policies, fostering inclusive economic growth and societal development.

Therefore, for women to be able to access the emerging WFH opportunities and survive in the ever changing world of technology, they should be equipped with the necessary current relevant skills. The

skills in this context should be those skills needed to interact with gadgets and systems in the upcoming fifth industrial revolution. Because technology continues to advance, universities as thinking spaces of society, should not ignore this situation. However, they should, start working closely with developers of these technologies to offer micro-credential certification courses. Thus, they would continuously upskill, the current crop of women, and enable these women, to keep pace with ever changing world of technology. These certificates and badges should be provided to those in colleges and in employment, to continuously upskill themselves. Consequently, universities will protect the gains made in empowering women, and also prepare them to be employable in the upcoming fifth industrial revolution. Furthermore, this would also, promote life-long learning in the ever-changing world of technology.

CONCLUSION:

A comprehensive literature review was conducted to explore the necessary skills for the work-from-home (WFH) concept in the context of the fifth industrial revolution, which coincides with rapid advancements in technologies such as Artificial Intelligence. It is crucial for universities, as intellectual hubs of society, to play an active role in granting micro-credential certifications that validate these acquired skills. Through our exploration of the work-from-home concept, we provided a comprehensive framework that outlines the requisite skills for the upcoming fifth industrial revolution. This approach will empower Zimbabwean women to compete effectively in the expanding WFH landscape. Given this, developing countries like Zimbabwe should prioritize and allocate sufficient resources to education, focusing on training and upskilling women. Additionally, investing in essential infrastructure, such as electricity and reliable networks, is paramount, to ensure widespread internet availability. This will enable vulnerable groups, including women and youth, to connect with developed economies and engage in remote work opportunities.

RECOMMENDATIONS:

Universities, being the intellectual bastions of society, should play a pivotal role in equipping Zimbabweans, especially women, with the necessary emerging skills through micro-credentials. This proactive approach will empower individuals to thrive in the ever-changing world of technology and contribute meaningfully to the workforce.

To preserve the value of traditional learning methods, micro-credentials should be offered as complementary certifications alongside long-term degrees and diplomas. This ensures a balanced approach to education, where the benefits of both short-term upskilling and comprehensive academic programmes are recognised.

The government should prioritize investment in critical infrastructure that supports connectivity, ensuring reliable and affordable access to the internet. This includes expanding network coverage, improving broadband speeds, and reducing the cost of network bundles. By addressing these barriers, more individuals, particularly women, will have the opportunity to engage in remote work and fully participate in the digital economy.

RECOMMENDATION FOR FUTURE WORK:

To foster a culture of lifelong learning and ensure the continuous development of necessary skills in a rapidly changing world, the adoption of micro-credentials stands as a feasible approach. Further extensive research is required to explore the significance and potential benefits of offering micro-credentials within Zimbabwean universities. Currently, there is a dearth of scholarly literature on this topic in the Zimbabwean context. Future research should delve into the percentage of Zimbabweans engaged in remote work and examine how local universities can effectively provide reputable micro-credential certifications. Empowering women to access remote job opportunities from abroad should be a particular focus of these efforts. By conducting thorough research and implementing appropriate strategies, Zimbabwe can embrace the potential of micro-credentials to enhance learning outcomes and empower individuals in the evolving world of work.

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CONFLICTS OF INTEREST:

This research work has no conflicts of interest.

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