



Research Article

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An Investigation on the Strategies to Bridging Gender, Socio- Economic and Digital Divides. A survey of Polytechnic Colleges, Zimbabwe.

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Abstract: Technical and Vocational Education and Training (TVET) plays a crucial role in equipping individuals with skills for the workforce. However, ensuring inclusivity in TVET remains a challenge. This study explores strategies for promoting inclusivity at polytechnic colleges dotted around the country, focusing on bridging gender, socio-economic and digital divides. Even when both genders have almost equal access to the ICTs and online services or similar literacy rates, women have a lower rate in technology related education, employment, income, and in social activities than men. Learning environments should be designed to be accessible and engaging for all students. A qualitative approach was used to gather and analyze data from polytechnic students. Semi-structured interviews with 20 students who were purposely chosen was conducted. The findings highlight evidence of inclusivity and challenges hindering inclusivity. The study recommends a range of strategies including promoting STEM education for girls, the institution should enhance its digital infrastructure, it is essential to implement targeted ICT training programs and seek partnerships with external stakeholders. The research contributes to the development of inclusive TVET programs that cater to the needs of all students regardless of their background or circumstances.

Keywords: Strategies, Inclusivity, Gender, TVET

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INTRODUCTION AND BACKGROUND TO THE STUDY

Inclusivity in TVET is crucial for ensuring that all students, regardless of their background, ability, or socio-economic status, have access to quality education and training. In line with vision 2030 of a world class economy and the president's mantra, leaving no one, and no place, inclusivity in TVET ensure that all female and male students partake in all technological advancement courses and trainings to equip them with 21st century digital skills. As stated in the SDGs, educational institutions must meet world standards in terms of digitalization and gender sensitive issues, in order to revolutionize our economies Kabeer (2018). Despite efforts by several organizations advocating for gender parity in education, there is still a gap on women inclusion in areas of ICT thereby creating a digital divide and limited women participation in decision making processes.

This study is informed by elements of gender disparities in TVET and digital phobia among learners in TVET. Therefore, this research explores strategies for promoting inclusivity in TVET, enhancing access to digital literacy and ending gender divide. These include digital literacy programs for women, focusing on essential technology skills, ensure TVET programs are

accessible to individuals from low-income backgrounds, the use of government gazette affordable fees and investing in digital infrastructure, such as internet access and digital tools, to support TVET programs.

The Constitution of Zimbabwe (2013), clearly states about the rights of all citizens, including the right to education, equality and non-discrimination. This justifies the need for strategies to end digital divide, gender imbalance and socio-economic discrimination in TVET. Correspondingly, the Disabled Persons Act (1992), aims at promoting the rights and welfare of persons with disabilities, ensuring equal opportunities and access to education, employment and healthcare thus inclusivity in TVET.

Universal Design for Learning (UDL) Theory emphasizes that learning environments should be designed to be accessible, equitable, responsive to the diverse needs of all students and engaging. Hence, TVET are embracing bridging digital divide, gender parity and socio-economic development through the Education 5.0, anchored on pillars of innovation, industrialization and community engagement, just to mention a few. Gendered curriculum is replaced by the enrolment of females into areas of specialization which were formally and traditionally meant for males for instance STEM.

Problem Statement

Despite efforts to promote inclusivity, TVET in Zimbabwe continues to face obstacles in providing equitable access, support and opportunities in bridging gender, and breaking a digital divide for students from diverse backgrounds, including those with disabilities, and from socio-economically disadvantaged families, resulting in limited social mobility, perpetuated inequalities, and gender disparities. Some lecturers still demanding students to submit hand written assignments, an indication that the strive towards inclusivity is hitting a brick wall. Some TVET are still struggling to provide stable network, thereby disadvantaging several learners who happen to lag behind from technology as compared to other colleges in the region. These divides hinder the development of a skilled and diverse workforce, exacerbating existing social and economic inequalities, and limit the potential for sustainable economic growth and development. Against this background, this qualitative research seeks to:

Unearth the strategies to bridging gender, socio-economic and digital divides. A survey for Polytechnic Colleges in Zimbabwe.

Research Objectives

- To investigate whether students at a selected Polytechnic Institution in Zimbabwe experience inclusivity.
- To identify barriers to inclusivity including digital divide, gender disparities and socio-economic discrimination.
- To explore strategies for promoting inclusivity, digital literacy and socio-economic opportunities for diverse student populations in TVET.

Purpose of the study

The purpose of the study is to explore the strategies to bridging gender, socio-economic and digital divides in Polytechnic Colleges in Zimbabwe. The results of the study will play an instrumental role in enlightening principals of Higher learning institutions, heads of departments, lecturers, students and other stakeholders of some of the challenges associated with inclusivity in trying to equip students with skills for workforce.

RESEARCH METHODOLOGY

The study used qualitative research design to investigate the strategies of bridging gender, socio-economic and digital divide. Creswell and Plano Clark, (2018), explain that this approach provides a more comprehensive understanding. One TVET college in Zimbabwe was selected as the site for this study using convenience sampling and the participants were purposefully selected for the study to get relevant information. According to Creswell (2014), the reason of choosing qualitative research is to select participants purposely which helps the researcher to understand the problem and the research question more. Participants

have been selected purposefully because of their knowledge and experience in using the ICTs and Internet on a daily basis for a long period since they were conducting their studies at that college. Qualitative research allows for depth understanding resulting in the provision of rich, detailed insights into participants' experiences, perceptions, and motivations. Denzin and Lincoln (2015), highlight its ability to capture the complexity of human behaviour. Therefore, researchers believe that there could be a rich source of information for this research study. Twenty participants were invited among the users of the Internet and ICT tools. They were all between the age of 19 to 40 years. Due to the commitments at their different study areas only ten students showed their interest in participation. Six of them were female, two from automotive engineering, another two from civil engineering and two from science department. The male students were two from ICT department and the other two from clothing and technology department. Before conducting the interviews, interview guide and consent form were prepared. The interview guide consisted of ten to thirteen exploratory questions, which were prepared in advance as a guide through the interview procedure. Since the interviews were semi-structured, researchers modified the approaches in response to participants' insights. Hence, Maxwell (2015), concludes that, this flexibility can lead to unexpected findings. The interviews were conducted face- to face. Internet users provided the required data to explore and understand the current situation regarding the usage and access to the computer, especially internet divide between both genders. It also provided suggestions for bridging the gap between the genders and empowering female students as well.

Ethical Considerations

Participants were not coerced to take part in the study; hence it was voluntary and they were free to withdraw at any time they felt to do so. To protect the identity of participants, pseudonyms were used in the study and this was made known to participants. Information gathered was also treated in utmost confidence so that participants would not be harmed in any way.

RESULTS

The findings of this study reveal significant disparities in access to digital technologies, digital competencies, and institutional support across gender and socio-economic lines. Through semi-structured interviews with ten participants, six females and four males from various academic departments, a nuanced picture emerged regarding the extent and nature of digital engagement within the TVET college.

Male students particularly those enrolled in the ICT department, indicated more frequent and confident use of digital technologies. They described having access to personal laptops and affordable data bundles, enabling them to engage in advanced tasks such as programming,

online learning, and digital troubleshooting. In contrast, female students especially those from non-technical departments such as civil engineering and science noted that their use of ICT tools was largely restricted to school hours. Shared resources, limited lab time, and domestic obligations were cited as barriers to consistent access. One female participant explained, *"I only use the computer at school, and sometimes I have to wait in line because they are not enough for everyone," while a male participant from the ICT department stated, "I have a laptop at home and I use it every day for programming and online courses."*

This gendered disparity also extended to digital skills competency. While all participants could perform basic digital tasks such as word processing and using email, male students demonstrated more advanced skills and greater confidence in navigating complex software (Maxwell J. A. (2015)). Female students were more likely to report limited prior exposure to digital technologies and a lack of confidence in using them, which they attributed to unequal access during their formative years.

Socio-economic background further compounded these disparities. Participants from low-income households, regardless of gender, faced challenges in affording personal devices, paying for Internet data, and maintaining consistent connectivity. However, these challenges disproportionately affected female students, who often faced additional pressures from family responsibilities that limited their study time and digital engagement at home. Female students, especially those with caregiving responsibilities, require additional support services to balance their academic and personal lives.

Participants indicated that at Harare Polytechnic, the institution is striving hard to embrace inclusive vocational and technical education. STEM Education for women is a milestone in encouraging girls and young women to pursue science, technology, engineering and mathematics fields, which have been traditionally male-dominated. A participant female student from engineering department had the following to justify, *"I am happy to be given the opportunity to enrol in a field of my choice, something which was difficult to do before feminist advocacy who raised concern about women's position in the society. Traditionally the field was considered a male endeavour due to its demanding nature. It was assumed that females were weak, an ideology inherited from the traditional and pre-industrialized societies which were illiterate and backward. It was a barbaric element, denying a girl child independence, freedom and autonomy."*

While the institution had taken steps to provide access to computer labs and Internet services, participants criticized the limited number of available machines and time restrictions. They expressed a desire for more inclusive training programs and support

structures, particularly those tailored to the needs of female students. Several female participants articulated a need for confidence-building workshops and mentorship programs led by women in STEM and ICT fields. Suggestions offered by participants to bridge the digital divide included increasing the number of computers, offering subsidized data bundles, organizing ICT workshops specifically for women, and establishing mentorship networks.

DISCUSSION OF RESULTS

The results of this study underscore the persistence of gender-based and socio-economic disparities in digital access and literacy within a Zimbabwean TVET context. These findings are consistent with existing literature, which highlights the systemic obstacles that limit digital participation among women and marginalized populations in developing countries (Hilbert, 2019; UNESCO, 2019; World Bank, 2020).

The observed gender differences in ICT access and use reflect broader societal norms and structural inequalities. Male students' greater access to digital tools and platforms allowed them to develop more advanced skills and engage in independent learning. Female students, on the other hand, often lacked the same opportunities and were hindered by cultural expectations and time constraints. Hilbert (2019) notes that such disparities are not merely technical but are deeply rooted in social and institutional contexts that privilege male access to technological resources.

Socio-economic status emerged as another critical factor influencing digital engagement. Students from lower-income households were less likely to own personal digital devices or afford Internet subscriptions, limiting their ability to participate in online learning and digital skill development. These findings resonate with global trends documented by the World Bank (2020), which emphasize that digital divides are often a reflection of broader economic inequities.

Institutionally, while the college provided basic ICT infrastructure, it lacked the capacity to meet the growing demand and did not offer gender-responsive training programs. Female students expressed a need for more inclusive pedagogies and a learning environment that supports different levels of digital literacy. Participants raised an alarm on issues of internet connectivity. *"At our department, Wi-Fi connectivity is very limited, LAN cables are damaged and some are old they need some repairs. Some of us come from low-income backgrounds, we cannot afford to buy data bundles."* This is an indication that incorporation of inclusive vocational and technical education in TVET institutions is being hindered by several barriers". Creswell and Plano Clark (2018) argue that mixed-methods research is particularly effective in uncovering

such complex, layered challenges, as it integrates statistical breadth with experiential depth.

Overall, these findings affirm the importance of addressing both gender and socio-economic barriers in the pursuit of digital equity. As Denzin and Lincoln (2015) emphasize, qualitative research is particularly well-suited to capturing the lived realities of marginalized groups, offering insights that can inform more inclusive educational policies and practices.

CONCLUSION AND RECOMMENDATIONS

To address the digital, gender, and socio-economic divides identified in this study, several strategic interventions are recommended. First, the institution should enhance its digital infrastructure by increasing the number of available computers and extending access hours in computer labs. This would help alleviate access bottlenecks and provide students especially those with limited home access more opportunities to engage with digital tools.

Secondly, it is essential to implement targeted ICT training programs that cater specifically to female students. These programs should focus not only on technical skills but also on building confidence and digital literacy in a supportive learning environment. Integrating digital literacy modules across all departments, rather than confining them to ICT-focused courses, would ensure that all students benefit regardless of their academic discipline.

Thirdly, the institution should adopt inclusive policies that recognize and address gender-specific barriers to digital engagement. Recruiting more female instructors and facilitators in ICT-related programs can make training sessions more relatable and encouraging for female learners.

Fourth, there is a clear need to establish mentorship and peer support networks. Connecting female students with successful women in STEM and ICT fields can provide essential guidance, motivation, and a sense of belonging. Interdisciplinary peer learning groups can further promote knowledge sharing and collaborative skill development.

Finally, to ensure sustainability and scalability, the college should seek partnerships with external stakeholders, including NGOs, government agencies, and technology firms. These partnerships can provide access to additional resources, training opportunities, and funding that specifically target disadvantaged and underrepresented student populations.

By implementing these recommendations, the institution can take meaningful steps toward bridging the digital divide and fostering a more inclusive and equitable learning environment. These efforts will not only improve digital literacy among all students but also empower female learners to fully participate in the digital economy.

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