Optimizing assistive technologies as a tool for ODeL implementation to learners with disabilities in TVET institutions in Kenya.

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Theme: Innovations for Education Resilience

Sub- theme: Promoting Equity and Inclusion

Abstract

Education for sustainable development is an essential component of every human being. This means that education should be available and accessible to all learners on the basis of equal opportunity and equity. However, the persons with disabilities are often marginalized and consequently, they may not access technical training as they should. The Corona virus has revealed emerging vulnerabilities in education systems around the world. It is now clear that Kenya needs flexible and resilient education systems as we face erratic futures. Technology could be leveraged to ensure that learning takes place even as the country faces the COVID-19 uncertainties. It is true that government agencies have focused more on providing access to the learners in TVET institutions through Open, Distance and eLearning (ODeL) systems but overlooked the aspect of equity. Therefore, there is necessity for special commitment to enhance necessary technology to allow access to training and transition to work for learners with disabilities in TVET institutions. This paper achieves this through (1) defining the key concepts of ODeL, and (2) Presenting a model for optimizing assistive technologies in TVET institutions. A descriptive research design was adopted for this study and pertinent literature was visited to capture the essence of continued learning during these unprecedented times. The paper concludes that the optimisation of assistive technologies as a tool for promoting equity and inclusion in TVET education is viable through proactive educational leadership and policies that ensure availability of the appropriate human capacity and infrastructural resources. (246 words)

Index terms ____Assistive Technologies, ODeL, learners with disabilities, TVET, COVID-19, Kenya

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1.0 Introduction

> ” The real miracle of technology may be the capacity it has to remove previously insurmountable barriers faced by persons with disabilities” (Simon, 1991).

The United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) underlines disabled students' right to excellent education and training (United Nations, 2006; UNESCO, 2013). More precisely, Article 24 of the Convention states that expanding access to education for learners with various forms of impairment requires the provision of assistive infrastructure. In this regard, Party States are advised to guarantee that educational institutions have the essential facilities built, installed, or given on a needs-basis to support mobility, participation, and curriculum implementation procedures (UNESCO, 2013). The Disability Act of 2012, read in conjunction with Article 54(1)(b) of the Kenya Constitution 2010, domesticates the Convention in Kenya. Despite the fact that TVET institutions in Kenya have given the required infrastructure to enable learners with disabilities to enter TVET, policymakers are nonetheless interested in how these facilities are used.

Assistive technology can be defined in a variety of ways. The focus will be on ICTs used by learners with special needs to 'overcome social, infrastructural, and other barriers' to independent learning, full participation in education, and carrying out learning activities ‘safely and easily' and with minimal assistance. both ODeL and AT are most beneficial as methods for gaining access to high-quality inclusive education that allows all learners to reach their full learning potential. As a result, AT can be used to get access to the curriculum and achieve favorable outcomes (Warger, 1998). Assistive and other learning technologies have considerable potential to support ODeL, since they provide different ways of learning, for instance using different types of multimedia, as well as expressing what has been learnt. However, there is both limited discussion on the use of technology to support ODeL in the literature and examples of its use in practice.

2.0 Review of related literature

2.1 Inclusive education

Inclusion or inclusive education (IE) can be defined as the philosophy and practice for educating students with disabilities in general education settings. IE implies that all students, regardless of their challenges are placed in age-appropriate general education classes that are in their own neighborhood schools to receive high quality instruction, interventions, and supports that enable them to meet success in the core curriculum (Bui, Quirk, Almazan, &Valenti, 2010; Alquraini & Gut, 2012). IE avails every learner a congenial atmosphere to learn and exhibit their knowledge without intimidation or compulsion. Hence, learning is natural and original and as well sustainable. Inclusion is an effective approach for placement and nurturing of special education students in public institutions (McManis, 2017).

2.2 Assistive Technologies (AT) in inclusive education

Technology has great potential in providing access for all learners, and the ability to access the general education curriculum. Assistive technology is a generic term that includes assistive, adaptive, and rehabilitative devices for individuals with disabilities and includes 'virtually anything that might be used to compensate for lack of certain abilities' (Reed and Bowser, 2005), ranging from low-tech devices like crutches or a special grip for a pen, to more advanced hearing aids and glasses, to high-tech devices such as computers with specialized software for helping dyslexics to read (WHO, 2009).

Approaches in the use of assistive technologies in inclusive education focus on using technology to train or rehearse, and to assist and enable learning. A large population of 'at risk' students are seen to need assistance, but since they often don't easily fit into a diagnostic profile, they often lack assistance. Assistive technologies serves in bridging this gap by 'assisting' in the practice of educating children in the same classroom, including children with physical, mental and developmental disabilities (Smith et al., 2005); Hence, with effective integration of assistive technologies into the regular classroom, students can have the provision of multiple means to complete their work, with greater independence in performing tasks that they were formerly unable to accomplish or could accomplish with great difficulty; through suitable enhancements or changed methods of interaction with the technology, needed to accomplish such tasks.

3.0 AT for Inclusive TVET in Kenya

During the COVID-19 pandemic, special needs TVET institutions (SNTVETs) in Kenya faced the wrath of COVID -19 like any other institution. Although other institutions managed to use online platforms for continuity of learning, SNTVETs were not able to learn effectively due to lack of proper infrastructure and better technology.

The government of Kenya through the state department of Vocational and Technical Training and Technical Vocational Education and Training Authority (TVETA) hence partnered with Commonwealth of learning (COL) to build capacity of trainers in SNTVETs for Open Distance and eLearning (ODeL) implementation.

Trainers in SNTVETs were trained on 'Introduction to Disability Needs Assessment' and 'Assistive Technology for Persons with Disabilities' during the period October 2021 - March 2022. The first course boosted participants' understanding of how to integrate assistive technology into teaching, while the second focused on aspects of disability needs assessment. Among the critical outcomes, participants noted increased confidence in their ability to identify free and accessible technologies to overcome specific learners' barriers.

Figure 1: Learners using assistive technologies to access eLearning content
Photo courtesy: Sikri Technical and Vocational College for the Blind and Deaf

Measures have been put in place to ensure that all Kenyan TVET learners have access to eLearning platforms; this has been achieved by ensuring that the national TVET learning management system has an accessibility feature to cater for learners with diverse needs.

4.0 Proposed model for optimizing AT in TVET institutions.

A descriptive survey design was employed in this study. The design was found to be suited for this study since a survey design secures evidence of the existing situation and identifies standards or norms to compare with the present conditions in order to plan the next step (Good, 1992). An online survey was done to 45 trainers from four (4) public special needs TVET institutions to describe the state of learning using technology during COVID 19 in Kenya. A linear regression was then performed to assess the impact of knowledge on AT, availability of AT, and type of AT on continued learning during COVID 19. The results are discussed below.

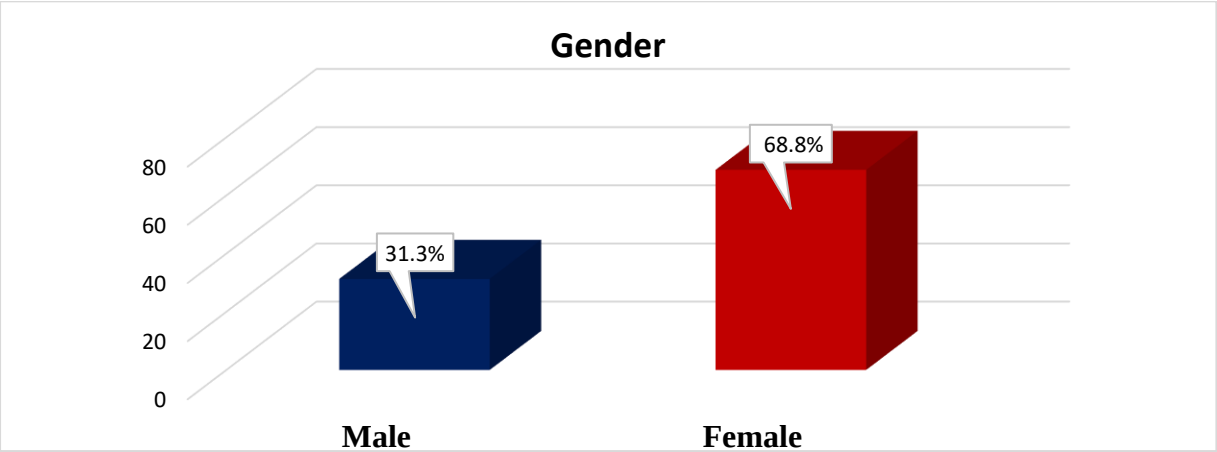

Figure 2: Gender analysis

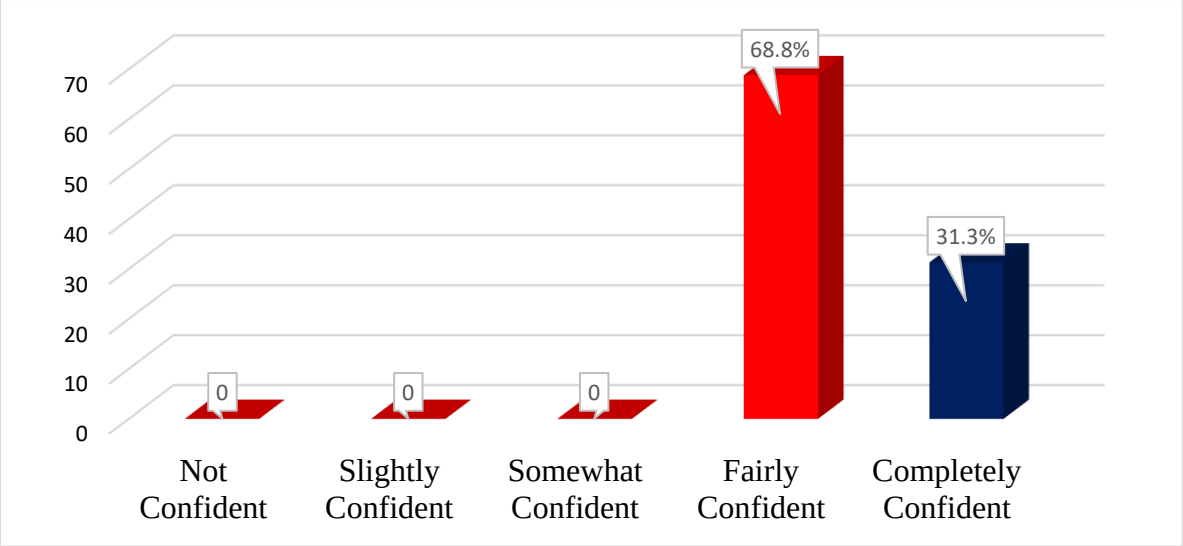

Figure 3: Confidence level in locating and identifying free and accessible Assistive Technologies to overcome specific barriers

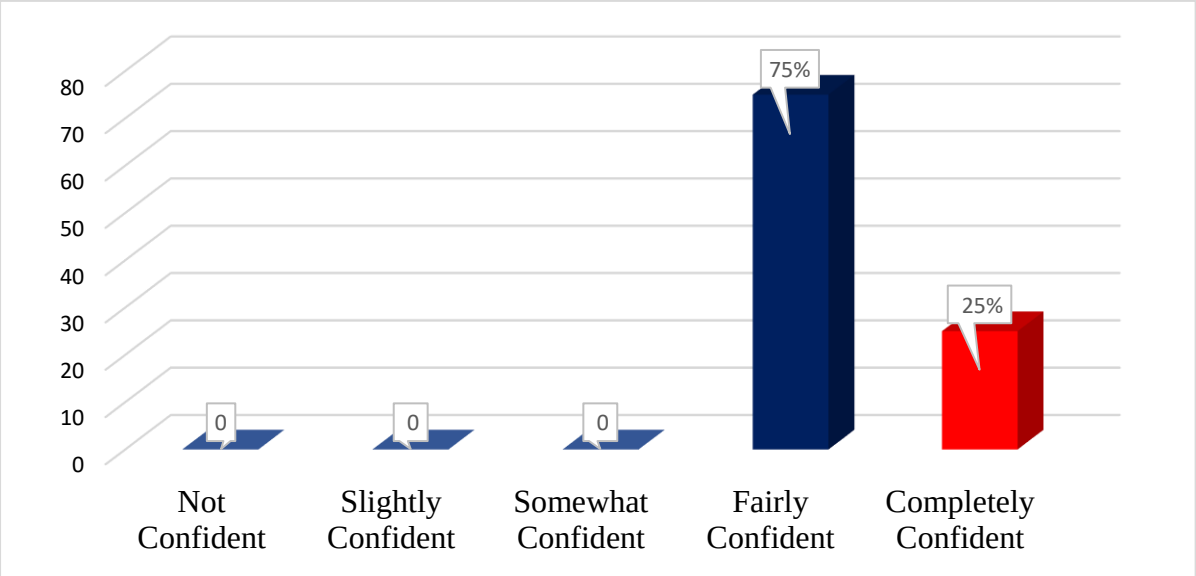

Figure 4: current knowledge/skill level in selecting appropriate assistive technologies to support disabled learners.

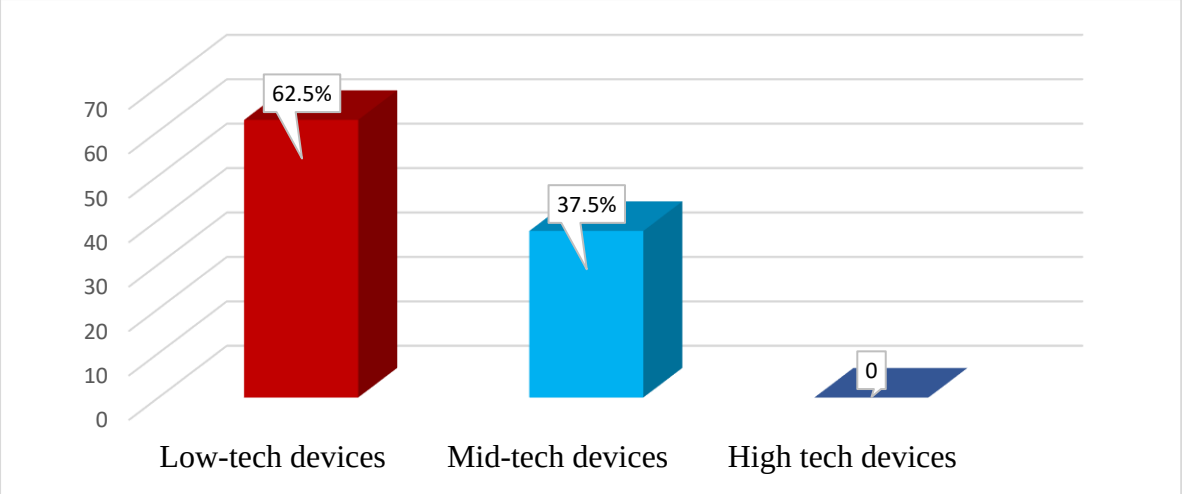

Figure 5: Type of Assistive Technology (AT) is available in the institution

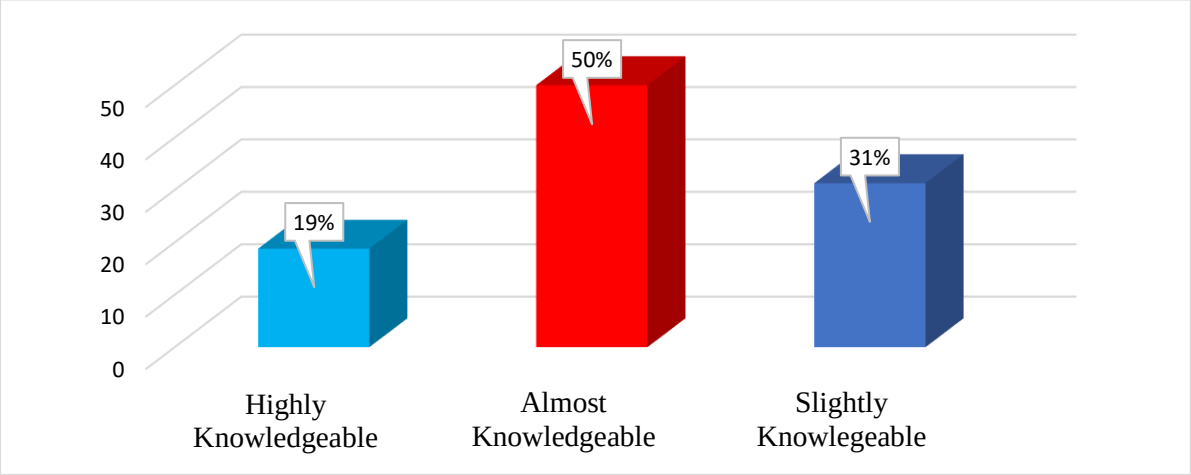

Figure 6: Trainers' level of knowledge and skills on using Assistive Technology.

4.1 Regression model

Coefficients							
	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
Model	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
(Constant)	.082	1.030		.080	.938	-2.185	2.349
Current knowledge/skill level in locating and identifying free and accessible Assistive Technologies to overcome specific barriers.	.235	.243	.280	.968	.354	-.300	.771

Current knowledge/skill level in selecting appropriate assistive technologies to support disabled learners.	-.102	.234	-.114	-.437	.671	-.618	.413
Available of Assistive technology (AT) in the TVET institutions	.532	.216	.632	2.460	.032	.056	1.009
Type of Assistive technology (AT) is available at the schools	-.126	.240	-.157	-.525	.610	-.655	.403
a. Dependent Variable: knowledge on AT, availability of AT and type of AT impact on learning continuity during COVID 19							

Y = **0.082 - 0.235**x_1 **- 0.102**x_2 + **0.532**x_3 **- 0.126**x_3

$Y_{\text{Continuity of learning during COVID 19}} = B_0 + B_1X_1 + B_2X_2 + B_2X_2 + B_3X_3$

B_0 = Constant (0.082)

X_1 = Knowledge in locating and identifying free and accessible AT

X_2 = Knowledge in selecting appropriate AT to support disabled learners

X_3 = Availability of AT in the schools

X_4 = Type of AT available at the school

4.2 Statistical significance of the model

From the results, the current knowledge/skill level in selecting appropriate assistive technologies to support disabled learners (p =.938), availability of Assistive technology (AT) in the TVET institutions (p=.032) and type of AT (p=.610) added significantly to the model prediction. The model prediction in this study had an overall classification rate of 54% which suggest that the model can be used as a guideline for optimizing assistive technologies as a tool for ODeL implementation to learners with disabilities in TVET institutions in Kenya. However, given the diversity of the education sector, the application of the model in different contexts can produce interesting results with crucial managerial implications.

5.0 Conclusion

In a time of continuous technological change, skills and knowledge become quickly out of date; hence the need to adopt new ideas. Assistive technologies (AT) have emerged as a promising trend to sustain inclusivity in Technical Vocational Education and Training (TVET) in the face of the global uncertainties. AT Advantages include liberating interactions between learners and instructors, from limitations of time and space through asynchronous and synchronous learning using eLearning facilities. With the present love for social networking sites among Kenyan youths, incorporating AT in eLearning stand a chance of stimulating interest amidst learners with disabilities while meeting the goals of TVET in Kenya as proved by the connectivism theory. It is therefore expected that TVET trainers and stakeholders should advocate, adopt and utilize the available AT in the training process to sustain and promote inclusive TVET in Kenya.

6.0 Recommendations

1. Preservice education programs should integrate assistive technology instruction to effectively educate certified TVET trainers who can work with a variety of learner populations.
2. Capacity building programs on the use of assistive technologies should be conducted to all TVET trainers in Kenya. A provision of in-service training for teachers, workshops, seminars, and conferences could accomplish this.
3. TVET trainers should endeavor on their own to equip themselves with knowledge on the use of AT without waiting for the government.

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