

# Flexible Learner Progression Modular training Approach and Trainees' Completion Rates in Technical and Vocational Education and Training. A Case of National Polytechnics In Kenya.

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## -----ABSTRACT-----

Technical and Vocational Education and Training (TVET) has been viewed as the driving force for sustainable growth by the United Nations Education, Scientific and Cultural Organization (UNESCO) since it provides an avenue for human capital development. This realization explains the increased Government expenditure in TVET education and reforms in training programme enshrined in the TVET ACT, 2013. This study sought to establish the influence of flexible learner progression on completion rates in National polytechnics in Kenya. Mixed Method research design was adopted. Numerical data was gathered through questionnaires and key informant interviews. The target population was 17,517. Simple random, systematic and census sampling techniques were employed. Data was analyzed quantitatively through descriptive and inferential statistics. Qualitative data was analyzed thematically and reported through direct and indirect statements. The study findings revealed that majority 75 (80.6%) of the HODs and trainees agreed that designing programs in line with consumer needs promoted access and completion of courses, individualized teaching/learning enhances completion rates 72 (77.40%) while multiple entry points actualized through the module approach created opportunities for disadvantaged trainees to join the system after dropping out. Correlation analysis indicated that there was strong significant positive correlation ( $r=0.671$ , sig. 0.00) between flexible learner progression and completion rates. Flexible learner progression was associated with 45.1% change/variance in completion rates; a unit change in flexible learner progression would result to increased completion rates by 1.4 times. This study recommends the adoption of flexible learning programs towards increased completion rates in National Polytechnics in Kenya.

**Key Words; Modular Training Approach, Completion Rates, Transition Rates, Flexible Learner Progression & Credit Transfer.**

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## I. Introduction

Technical and Vocational Education and Training (TVET) has increasingly been recognized as a central pillar in the advancement of economic growth, industrialization, and sustainable workforce development across the globe. The demand for a highly skilled, adaptable, and innovation-oriented workforce has elevated the strategic importance of TVET systems in equipping individuals with relevant competencies for both formal employment and self-employment. According to UNESCO (2023) and the International Labour Organization (ILO, 2022), TVET encompasses the acquisition of technical knowledge, practical skills, and work-related attitudes necessary for effective participation in various sectors of economic and social life. Empirical evidence from the OECD (2021) indicates that countries with strong TVET systems exhibit higher levels of youth employability and smoother school-to-work transitions, underscoring the role of skills development in economic competitiveness. This positioning aligns TVET with global development frameworks, particularly Sustainable Development Goal 4.

Kenya's TVET institutions are experiencing rapid digital revolution, creating unique opportunities for enhanced pedagogical activities, administrative efficiency, and production of globally competitive graduates.

Due to technology advancements, Technical and Vocational Education and Training (TVET) institutions in Kenya are heavily relying on digital tools to heighten their educational activities, administrative operational structures, and data management. Low completion rates in TVETs serve as an important indicator of internal inefficiency and low institutional performance which negatively affect both institutional efficiency and labour market outcomes. Evidence from the National Center for Education Statistics (2022) shows that in the United States, approximately one-third of learners enrolled in vocational and technical programmes do not complete their studies within the stipulated period.

Despite the implementation of numerous reforms, the European Commission (2021) indicates that completion rates in several European TVET systems are below established targets. Low completion rates can result in substantial socio-economic consequences, such as the inefficient use of educational resources, lower workforce productivity, and limited development of human capital. From a broader systems perspective, completion rates provide an indication of how effectively training institutions and structures respond to learners' needs, socio-economic circumstances, and changing labour market requirements.

TVET institutions have shifted from conventional linear training models toward more flexible modular approaches to address the challenges. Modular training involves reorganizing curricula into smaller, competency-based units that can be assessed, completed, accumulated, and certified independently. In contrast to traditional systems, which often require learners to follow a fixed and sequential progression, modular training provides greater flexibility by allowing recurrent learning where learners study at their own pace, and accumulate credits over an extended period (Cedefop, 2022). Flexible modular approach has become a key accelerator of completion rates in TVETs. Flexible modular approach refers to the ability of TVET Programs to meet the uniqueness of the TVET consumers to facilitate transition from one module to another. Flexible learner progression, in particular, has been empirically linked to improved completion outcomes. OECD (2021), drawing on cross-country data, reports that modular systems with flexible progression pathways achieve completion rates exceeding 80% in some jurisdictions due to reduced repetition and increased learner autonomy. Similarly, UNESCO (2022) finds that flexible pathways enable learners to balance education with work and family responsibilities, thereby enhancing persistence. However, Cedefop (2022) presents contrasting evidence, indicating that flexibility may also create exit points that encourage learners to leave training prematurely when partial qualifications provide immediate employment opportunities. This paradox highlights the need for contextual analysis of flexible progression mechanisms.

The Kenyan government has accelerated this agenda through expansive digital infrastructure investment, including the establishment of digital hubs nationwide, and championing the establishment of TVET institutions, and boosting operationalization through installation of fiber connectivity to enhance operationalization. TVET institutions handle sensitive student data, financial information, manage digital learning platforms, research data, and deliver majority of services through online platforms (Kithungu, R. M., Kasivu, G. M. 2026).

At the global level, modular TVET systems have gained traction as mechanisms for improving access, retention, and completion rates. Flexible learner progression, in particular, has been empirically linked to improved completion outcomes. OECD (2023), drawing on cross-country data, reports that modular systems with flexible progression pathways achieve completion rates exceeding 80% in some jurisdictions due to reduced repetition and increased learner autonomy. Similarly, UNESCO (2022) finds that flexible pathways enable learners to balance education with work and family responsibilities, thereby enhancing persistence. However, Cedefop (2022) presents contrasting evidence, indicating that flexibility may also create exit points that encourage learners to leave training prematurely when partial qualifications provide immediate employment opportunities. This paradox highlights the need for contextual analysis of flexible progression mechanisms.

Within the African context, TVET reforms have increasingly focused on modular and competency-based training systems to address challenges of youth unemployment, informality, and skills mismatch. The African Union (2022) emphasizes the role of flexible training pathways in improving access and inclusion. Empirical evidence from South Africa shows that the implementation of modular qualifications under the National Qualifications Framework increased completion rates to approximately 45.5% (SAQA, 2022). Similarly, World Bank (2021) studies in Uganda and Rwanda indicate that flexible progression pathways improve retention among economically disadvantaged learners. However, systemic challenges, including weak institutional capacity, inadequate infrastructure, and limited industry linkages, continue to constrain outcomes across the region.

In Kenya, Technical and Vocational Education and Training (TVET) is a critical component of national development initiatives, principally within the framework of Vision 2030, which recognizes skills development as a catalyst for industrialization. The enactment of the TVET Act (2013) and the implementation of Competency-Based Education and Training (CBET) led to the introduction of modular training approaches aimed at improving flexible learner progression and learner completion rates. These reforms incorporated several

fundamental elements of modular training, such as flexible progression pathways, unit-based curricula, accumulation of credits, and competency-oriented skills development (Government of Kenya, 2025).

Empirical data indicate an overall completion rate of approximately 33.4% in National Polytechnics in Kenya, this indicates that a significant proportion of enrolled trainees do not successfully complete their programmes within the expected timeframe. This pattern points to systemic inefficiencies within the TVET subsector and raises critical concerns regarding learner retention and progression. In addition, these findings reveal a critical disconnect between policy intentions and actual outcomes within Kenya's TVET sector. The wide institutional variation further suggests that contextual and structural factors, including differences in implementation of modular training components, training flexibility, resource availability, and administrative practices, may significantly influence completion outcomes. This study sought to address this gap by providing empirical evidence on how flexible learner progression can impact on completion rates in national polytechnics within the Kenyan context.

## **1.2 Statement of the Problem**

The essence of Technical and Vocational Education and Training is to improve the skills of individuals for personal and public gains. Funding technical education is both a national and international education agenda. In a regulatory regime on reshaping education and training in Kenya (MOE, 2012), the Kenyan government initiated the module training program to improve completion rates through enhanced flexibility to TVET education. Several initiatives have been put in place; academic credit transfers, content unitization, skill acquisition through modular training, and flexible learner progression to improve completion rates in TVET institutions.

Regardless of the initiatives to improve TVET education, completion rates in National Polytechnics remain low. According to the National Polytechnic Administrative Records, (2023), the institutional administrative records from National Polytechnics in Kenya for the period 2018-2023, indicate that out of 94,549 trainees enrolled, only 31,568 completed their training, representing an overall completion rate of approximately 33.4 %  $(31,568 \div 94,549) \times 100$ . These figures are based on combined institutional data which is indicative of low completion patterns within National Polytechnics.

In addition, many trainees still fail to complete their programs due to academic, financial, and structural challenges. The modular approach is intended to address these barriers by breaking learning into competency-based units that support flexible learner progression. However, its effectiveness in improving completion rates in National Polytechnics in Kenya remains insufficiently examined. Therefore, there is a need to critically examine whether flexible learner progression modular approach can effectively contribute to improved completion rates in National Polytechnics in Kenya, which forms the basis of this study.

## **1.3 Specific Objective of the Study**

To determine the influence of flexible learner progression on trainees' completion rates in National Polytechnics in Kenya.

## **1.4 Research Hypothesis**

**H<sub>01</sub>:** There is no statistically significant relationship between flexible learner progression and trainees' completion rates in National Polytechnics in Kenya.

## **II. Literature Review**

Flexible learner progression has emerged as a central organizing principle in contemporary Technical and Vocational Education and Training (TVET) systems, driven by the global shift toward competency-based, modular, and lifelong learning frameworks. At its conceptual core, flexible progression refers to structured learning pathways that allow trainees to advance through training programmes at individualized paces, pause and re-enter learning without loss of credit, and accumulate competencies incrementally toward full qualifications (Sadiq & Zamir, 2020; Staisloff & Donna, 2021). This approach fundamentally departs from rigid, time-bound educational models and is grounded in human capital and constructivist learning theories, which emphasize learner autonomy, mastery of competencies, and responsiveness to diverse socio-economic realities.

Empirically, flexible progression is widely associated with improved access, retention, and completion outcomes, particularly in well-resourced TVET systems. Evidence from OECD (2021), based on cross-country comparative analysis of administrative education datasets, shows that countries with well-structured credit-based and modular progression systems report higher completion rates, often exceeding 70-80% in selected jurisdictions. For example, studies of dual training systems in Germany, drawing on longitudinal cohort tracking data (GOVET, 2022), demonstrate strong completion outcomes attributed to structured progression pathways that integrate workplace learning with formal instruction. What these findings imply is that flexibility, when

embedded within structured institutional systems, reduces uncertainty in learning pathways and sustains learner commitment over time.

Similarly, Australia's competency-based training framework, examined through mixed-method evaluations combining national survey data and administrative completion records (NCVER, 2021), has been associated with improved retention among adult learners due to recognition of prior learning and flexible entry-exit points. This suggests that flexible progression is particularly effective for non-traditional learners, as it accommodates interruptions without penalizing progression. In essence, the literature here indicates that flexibility works not merely because it allows movement, but because it aligns training structures with real-life learner constraints. Neal (2011) identified traditional delivery approach limited completion rates in TVET education through limited physical facilities, location and operating hours among other factors presenting barriers to many prospective clients. Available literature observe that flexible delivery approach has the ability to make TVET education cost effective, time efficiency, provided for individual learning differences, flexible access to training resources among other factors promoting completion rates.

However, the global literature also presents a critical counter-narrative that complicates this positive interpretation. Cedefop (2022; 2015), using policy analysis combined with institutional case studies across European TVET systems, identifies what is termed the "early exit effect," where learners leave training prematurely after acquiring partial qualifications that are immediately marketable. Empirical evidence from these studies shows that in labour markets with high demand for semi-skilled labour, modular systems may reduce full programme completion. The implication of this finding is significant: flexibility may shift learner incentives away from completion toward early labour market entry, meaning that completion is not solely a function of training design but also of external economic opportunities (Tiony et al., 2021).

Regionally, African TVET systems have increasingly adopted flexible learner progression as part of broader reforms aimed at addressing youth unemployment and low retention. Empirical studies across Sub-Saharan Africa provide mixed but contextually rich evidence. For instance, Audu, R et. al., (2021), using a quantitative survey design complemented by regression analysis in South African TVET colleges, found that flexible progression improved completion rates among disadvantaged learners by allowing re-entry after financial interruptions. Similarly, Buhwamatsiko Tumuheki, et al. (2022), using a case study approach with qualitative interviews in Uganda, observed improved retention among learners balancing work and study responsibilities.

What these studies collectively suggest is that in low-income contexts, flexibility functions as a coping mechanism that allows learners to navigate economic instability. However, this benefit is not uniform. The World Bank (2021), drawing on multi-country system diagnostics and administrative data, reports that flexible progression in many African TVET systems is undermined by weak institutional capacity, poor learner tracking systems, and inadequate funding. In such contexts, flexibility may result in "stalled progression," where learners neither drop out formally nor complete programmes. This reveals an important nuance: flexibility may increase participation without necessarily improving completion hence the need for the current study which sought to determine the influence of flexible learner progression on trainees' completion rates in National Polytechnics in Kenya.

In East Africa, regional integration efforts under the East African Community (EAC, 2020) have emphasized harmonization of competency-based frameworks. Rwanda's system, examined through policy evaluation and administrative tracking data (Nsabimana et al., 2022), shows improved learner re-entry and continuity. However, UNESCO-UNEVOC (2021), using comparative case studies across training institutions, highlights that implementation remains inconsistent due to infrastructural and policy constraints. This suggests that the effectiveness of flexible progression is highly dependent on system-level coherence rather than policy adoption alone.

In Kenya, flexible learner progression is institutionalized through the TVET Act (2013) and CBET framework. However, empirical studies indicate persistent implementation gaps. Tiony, Kisilu, and Ferej (2022), using a descriptive survey design in Kenyan TVET institutions, found that institutional rigidity, limited instructor preparedness, and inadequate resources constrain effective implementation. Additionally, TVET Authority (2022), based on institutional audit reports, highlights inconsistencies in learner tracking and progression monitoring. What this Kenyan evidence implies is that while flexibility exists at the policy level, it is not fully operationalized at the institutional level. As a result, the expected benefits of flexible progression improved completion may not materialize. Instead, flexibility may lead to extended study durations or intermittent participation rather than successful completion.

From a methodological perspective, the literature reveals several gaps. First, a majority of studies rely on cross-sectional survey designs, which capture perceptions at a single point in time and do not track actual learner progression trajectories. This limits the ability to establish causal relationships between flexible progression and completion outcomes unlike the current study that uses descriptive correlational approaches in its investigation. Second, there is limited use of longitudinal or cohort-based data, which would provide stronger

evidence on how learners move through modular systems over time. Third, many studies rely on descriptive statistics, with minimal application of multivariate models capable of isolating the independent effect of flexible progression from other variables this study has deviated and used descriptive correlational approaches to determine the correlation between flexible learner progression and trainees' completion rates in National Polytechnics in Kenya.

Conceptually, the literature tends to treat flexible learner progression as an independent determinant of completion. However, emerging evidence suggests that its effect is mediated by other factors such as institutional capacity, labour market conditions, and learner support systems. This indicates that flexible progression does not operate in isolation but interacts dynamically with other modular training components, including credit transfer, content unitization, and skill acquisition. A key conceptual gap therefore lies in the lack of integrated analytical frameworks that examine how flexible progression interacts with these components to influence completion outcomes. Additionally, there is limited understanding of whether flexibility leads to completion or merely prolongs participation in training systems.

Therefore, while empirical evidence suggests that flexible learner progression enhances access and retention, its influence on completion rates remains inconclusive and context-dependent. The contradictions between positive outcomes in well-resourced systems and mixed outcomes in developing contexts, combined with methodological limitations and weak conceptual integration, highlight a significant research gap. This study addresses this gap by empirically examining how flexible learner progression interacts with other modular training dimensions to influence trainee completion rates in Kenyan National Polytechnics.

### III. Research Methodology

#### 3.1 Research Design

The study used mixed-methods research design, which combined case study, descriptive and correlational research approaches in data collection, analysis, and inference techniques for the broad purposes of in depth understanding and corroboration of a phenomenon. In particular, triangulation research design guided the study through application of the concurrent triangulation procedure. The mixed research design combined the strength of the qualitative and quantitative approaches deepening and enriching the study findings and upholding the validity of the research findings. This involved the concurrent collection and analysis of quantitative and qualitative data, comparing results, validating, confirming and corroborating quantitative results with qualitative findings resulting to valid and well-substantiated conclusions about the phenomenon (Cohen, Manion and Morrison, 2007).

#### 3.2 Target Population

The target population consisted of 10 Registrars, 129 Heads of Department [HoDs] and 17,378 Module III trainees enrolled in 10 out of 11 National Polytechnics in Kenya in the 2019/20 academic year.

**Table 3.1: Target Population in National Polytechnics**

|    | Institution      | Applied Sc. | ICT         | EE&E        | Hospitality | Business   | Mech. Eng.  | BCE         | Liberal    | Health     | TOTAL        |
|----|------------------|-------------|-------------|-------------|-------------|------------|-------------|-------------|------------|------------|--------------|
| 1  | Kisumu NP        | 533         | 445         | 355         | 89          | 45         | 88          | 89          | 88         | 44         | 1776         |
| 2  | Eldoret NP       | 623         | 622         | 531         | 178         | 44         | 178         | 220         | 89         | 46         | 2531         |
| 3  | Meru NP          | 667         | 533         | 310         | 45          | 45         | 177         | 177         | 45         | 45         | 2044         |
| 4  | Kenya Coast NP   | 533         | 355         | 177         | 44          | 44         | 178         | 133         | 44         | 44         | 1552         |
| 5  | Kabete NP        | 755         | 311         | 311         | 47          | 44         | 45          | 130         | 132        | 45         | 1820         |
| 6  | Nyeri NP         | 666         | 266         | 264         | 47          | 48         | 133         | 120         | 89         | 55         | 1688         |
| 7  | North Eastern NP | 489         | 266         | 168         | 45          | 44         | 133         | 143         | 44         | 23         | 1355         |
| 8  | Sigalagala NP    | 532         | 311         | 266         | 75          | 44         | 177         | 101         | 45         | 44         | 1595         |
| 9  | Kitale NP        | 444         | 266         | 221         | 44          | 43         | 133         | 135         | 44         | 45         | 1375         |
| 10 | Kisii NP         | 400         | 355         | 380         | 44          | 44         | 153         | 133         | 88         | 45         | 1642         |
|    | <b>TOTAL</b>     | <b>5642</b> | <b>3730</b> | <b>3017</b> | <b>622</b>  | <b>442</b> | <b>1375</b> | <b>1417</b> | <b>707</b> | <b>426</b> | <b>17378</b> |

#### 3.3 Sample Size and Sampling Techniques

Census sampling technique sampled the 10 Academic registrars. Proportionate stratified sampling was further employed to determine the number of trainees selected from each institution. The sample size distribution was calculated as a proportion of the target population of trainees ( $N = 17,378$ ) multiplied by the trainee sample size ( $n = 391$ ), as derived from Slovin's formula. Similarly, for Heads of Departments, the

distribution was based on the population ( $N = 129$ ) and sample size ( $n = 98$ ). This method was appropriate because it ensured that institutions with larger trainee populations contributed proportionally more respondents than smaller ones, thereby maintaining proportionality and enhancing the representativeness of the overall sample. Simple random sampling technique was used to arrive at 98 Heads of Departments where each HOD was assigned random numbers, and a table of random numbers was used. The Heads of Department were preferred due to their oversight role in implementing the module training program in the departments. To ensure equal representation of each National Polytechnic in the study, stratified random sampling technique was adopted to arrive at 391 Module III Trainees where each Institution was treated as a sub-group.

### **3.4 Research Instruments**

Questionnaires was used to collect opinions and experiences of the modular program from the heads of departments and the students. Key informant's interviews were employed to gather in-depth data from National Polytechnics Academic Registrars by using a series of predetermined questions. Documentary analysis was used to investigate national examinations records, admissions manual book, attendance records and graduation records in the institutions for triangulation.

### **3.5 Validity and Reliability of Research Instruments**

To attain content-related validity, the data collection tools were piloted on 10% of the targeted study sample. The findings guided the modification of the research tools to ensure accuracy and relevance (Mugenda & Mugenda, 2003). The split-half technique was used during piloting to establish the reliability of the data collection instruments. According to John W. Creswell (2022), the split-half method is a quick, effective, and appropriate approach for assessing internal consistency, particularly when using large questionnaires. The technique involves dividing the instrument into two equivalent halves, commonly odd-numbered and even-numbered items, and correlating the scores obtained from the two halves.

Reliability was computed using the Guttman Split-Half Coefficient formula:

$$r_{gh} = \frac{2r_{xy}}{1+r_{xy}}$$

Where:

- $r_{gh}$  = Guttman split-half reliability coefficient
- $r_{xy}$  = correlation between the two halves of the instrument

The reliability analysis yielded a Guttman coefficient of 0.83 for flexible learner progression and completion rates (Cresswell, 2022).

### **3.6 Data Collecting Procedures**

The research project was authorized by the Board of Postgraduate Studies at South Eastern Kenya University. Authorization was received, and the investigator next applied to the National Commission on Science, Technology, and Innovation for a research permit (NACOSTI). In addition, the investigator secured approval to conduct the investigation from the Ministry of Education and the National Polytechnic Principals.

### **3.7 Data Analysis Techniques**

Data collected was gathered, sorted and evaluated for errors, cohesiveness, and reliability, and then it was set up so that it could be coded and analyzed. Qualitative data was categorized into themes and sub themes strengthened by narrations and descriptions derived from the open-ended questions and the responses of the Academic Registrars. Content analysis was used to analyze the admission manual register document and the Learning Management System (LMS). The Statistical Package for Social Science (SPSS) version 31.0.0 was used to analyze descriptive and inferential statistics. Frequency tables were used to present the descriptive results. Qualitative data was presented through direct quotations. Pearson coefficient ( $r$ ) a basic probability value between 0.00 and 0.05 was used to dismiss or adopt the study hypothesis while the Pearson correlation coefficient ( $r$ ) was used to assess the magnitude and effect of the association between flexible learner progression and trainees' completion rates. Pearson chi squared test (2) was used to determine the level of influence of flexible learner progression on trainees' completion rates. Regression analysis was used to establish the contribution of the independent variable to completion rates in National Polytechnics.

#### IV. Research Results

##### 4.1 Flexible Learner Progression and Completion Rates in TVET

##### 4.1.0 HODs Opinions on Influence of Flexible Learner Progression on Trainees' Completion Rate in National Polytechnics in Kenya

The study first examined HoDs' perceptions regarding the influence of flexible learner progression on trainees' completion rates in National Polytechnics. Respondents were asked to rate statements using a five-point Likert scale.

**Table 4.1: HoDs Responses on Flexible Learner Progression and Completion Rates**

| Statement                                                                                 | Strongly Disagree |     | Disagree |     | Neutral |      | Agree |      | Strongly Agree |      |        |
|-------------------------------------------------------------------------------------------|-------------------|-----|----------|-----|---------|------|-------|------|----------------|------|--------|
|                                                                                           | N                 | N % | N        | N % | N       | N %  | N     | N %  | N              | N %  | M      |
| Multiple pathways enhance increased completion rates in NPs.                              | 3                 | 3.2 | 0        | 0.0 | 62      | 66.7 | 23    | 24.7 | 5              | 5.38 | 3.2903 |
| Designing programs in line with consumer needs promotes access and completion of courses. | 0                 | 0.0 | 0        | 0.0 | 18      | 19.4 | 40    | 43.0 | 35             | 37.6 | 4.1828 |
| Individualized teaching /learning enhances completion rates in NPs.                       | 0                 | 0.0 | 3        | 3.2 | 18      | 19.4 | 49    | 52.7 | 23             | 24.7 | 3.9892 |
| Flexible learning programs reduces dropout resulting to increased completion rates in NPs | 0                 | 0.0 | 0        | 0.0 | 59      | 63.4 | 27    | 29.0 | 7              | 7.5  | 3.4409 |
| Multiple entry points enhances completion rates in NPs                                    | 0                 | 0.0 | 3        | 3.2 | 38      | 40.9 | 21    | 22.6 | 31             | 33.3 | 3.8602 |

**Key: F-Frequency, M-mean**

The results indicated that a majority of HoDs agreed that designing programmes in line with consumer needs enhances access and completion rates (80.6% agreement) and that individualized teaching and learning improves completion rates (77.4%). Similarly, 55.9% of the respondents agreed that multiple entry points enhance completion rates.

However, responses were mixed regarding whether multiple pathways enhance completion rates and whether flexible learning programmes reduce dropout rates, with 66.7% and 63.4% respectively indicating neutrality. This suggests uncertainty among HoDs regarding the practical effectiveness of some flexibility components, possibly due to implementation challenges. Overall, qualitative responses from HoDs indicated that although flexible learner progression positively influences completion rates, its effectiveness depends on adequate staffing, infrastructure, and financial resources.

##### 4.1.1 Trainees' Opinions on Flexible Learner Progression and Completion Rates

The study also examined trainees' views on the influence of flexible learner progression on completion rates in National Polytechnics.

**Table 4.2: Trainees Responses on Flexible Learner Progression and Completion Rates**

| Statement                                                                        | Strongly disagree |      | Disagree |      | Neutral |      | Agree |      | Strongly agree |      | M    |
|----------------------------------------------------------------------------------|-------------------|------|----------|------|---------|------|-------|------|----------------|------|------|
|                                                                                  | N                 | N %  | N        | N %  | N       | N %  | N     | N %  | N              | N %  |      |
| Multiple pathways enhance progression in NPs                                     | 67                | 17.2 | 0        | 0.0  | 105     | 27.0 | 172   | 44.2 | 45             | 11.6 | 3.33 |
| Designing programs in line with consumer needs promote completion rates.         | 18                | 4.6  | 106      | 27.1 | 53      | 13.6 | 156   | 39.9 | 58             | 14.8 | 3.33 |
| Individualized teaching /learning enhances completion rates in NPs.              | 124               | 31.7 | 144      | 36.8 | 77      | 19.7 | 32    | 8.2  | 14             | 3.6  | 2.15 |
| Multiple pathways enhance retention hence increased completion rates.            | 112               | 28.6 | 26       | 6.6  | 22      | 5.6  | 103   | 26.3 | 128            | 32.7 | 3.28 |
| Adapting programs to meet work demands in education promotes flexibility in NPs. | 90                | 23.0 | 0        | 0.0  | 99      | 25.3 | 61    | 15.6 | 141            | 36.1 | 3.42 |

**Key: F-Frequency, M-mean**

The results indicate that more than half of the trainees were in agreement that flexible learner progression enhances completion outcomes in National Polytechnics. Specifically, 55.8% of the respondents

agreed that multiple pathways enhance progression, while 54.7% indicated that programmes aligned to learner needs improve completion rates. In addition, 59.1% of the trainees agreed that multiple pathways enhance retention, and 51.7% observed that flexibility in programme delivery improves responsiveness to work-related demands.

However, a considerable proportion of trainees disagreed that individualized teaching and learning enhances completion rates, suggesting variations in perceptions between trainees and Heads of Department regarding the effectiveness of this aspect of flexible learning. Overall, the findings further show that trainees perceive flexible learner progression as an influential factor in completion rates, with 50.6% indicating that it is very influential and 33.0% indicating that it is influential (Table 4.3).

**Table 4.3: Trainees opinion on influence of Flexible Learner Progression on completion rates.**

|                  | Frequency  | Percent      |
|------------------|------------|--------------|
| Very influential | 198        | 50.6         |
| Influential      | 129        | 33.0         |
| Not Influential  | 34         | 8.7          |
| Neutral          | 30         | 7.7          |
| <b>Total</b>     | <b>391</b> | <b>100.0</b> |

The findings in Table 4.3 indicate that trainees generally perceived flexible learner progression as an important determinant of completion rates in National Polytechnics. A majority of the respondents (50.6%) reported that flexible learner progression is very influential on completion rates, while 33.0% indicated that it is influential. Only a small proportion of respondents considered it not influential (8.7%) or were neutral (7.7%). These results suggest that most trainees acknowledge the positive role of flexible learner progression in supporting completion of studies, particularly through improved access, adaptability, and responsiveness to learner needs.

However, some key informants observed that flexible training approach is not an answer to all problems facing the TVET sector since it is not easily integrated to government funding formulae, infrastructure and human resources. One of the key informants pointed;

*“Flexible learning requires a different set of expectations for Trainers to recognize the expanded role in facilitating flexible learning such as training beyond the traditional contact hours, the ability to offer individualized training and assessment necessitating retooling of trainers into the new approach, the need for adequate physical facilities, adequate human resources missing in the TVET sector*

#### 4.1.2 Correlation Analysis

##### 4.1.2.1 Completion Rates Analysis

To establish the significance of the module program on completion rates, the researcher analyzed completion rates between 2018 to 2021 in National Polytechnics and found that the module programs had very significant influence on completion rates as shown in table 4.4.

**Table 4.4: Completion Rates Analysis**

| Year         | Enrolment    | Completed    | % Completion | Credits Transferred |
|--------------|--------------|--------------|--------------|---------------------|
| 2018         | 11337        | 2998         | 26.4         | 14                  |
| 2019         | 16127        | 4362         | 27.0         | 19                  |
| 2020         | 14221        | 2740         | 19.3         | 6                   |
| 2021         | 17492        | 4816         | 27.5         | 82                  |
| <b>Total</b> | <b>59177</b> | <b>14916</b> | <b>25.2%</b> | <b>121(0.8%)</b>    |

Cohort analysis according to academic HODs and Institute registrars indicate an overall completion rate of 25.2%. More findings indicate higher completion rate for the 2019 cohort (27%) compared to 26.4% for 2018, 19.3% (2020) and 27.5% for 2021 cohort. The reports indicate lowest completion rates for the 2020 cohort of 19.3%. The study found 0.8% of completion rates in NP in Kenya can be explained by the transfer of academic credits from one Institution to other cautioning trainees who would have dropped out as a result of factors necessitating the learner to shift location of residence. The results of the dependent variable were correlated with the independent variable to test the hypothesis by determining the strength of the relationship and the intensity of significance for each of the dependent variable.

#### 4.1.4 Correlation Analysis of Flexible Learner Progression on Completion Rate in National Polytechnics in Kenya

The research performed examination of variable connectivity in order to establish whether there exist correlations between flexibility in learner progression and completion rates in National Polytechnics in Kenya

using responses from HODs. The study's first hypothesis was formulated as follows;  $H_{01}$ : There is no statistically significant relationship between flexible learner progression and trainees' completion rates. Correlation analysis indicated that, there was strong significant positive correlation ( $r=0.671$ , sig. 0.00) between flexible learner progression and completion rates in National Polytechnics in Kenya as shown in table 4.5

**Table 4.5: Correlation table between flexible learner progression and completion rate**

|                              |                     | Flexible learner progression | Completion rate |
|------------------------------|---------------------|------------------------------|-----------------|
| Flexible learner progression | Pearson Correlation | 1                            | .671**          |
|                              |                     |                              |                 |
| Completion Rate              | Pearson Correlation | .671**                       | 1               |
|                              | Sig. (2-tailed)     |                              | .000            |
|                              | N                   | 93                           | 93              |

The correlation index is a way to figure out how strongly two continuous variables are linked. The index is a value lying between -1 through 0 to +1. The extreme values of -1 and +1 signify a high degree of correlation in which a change in one variable is matched by a modification in the other factor that is entirely similar to previous adjustment. The absence of any linear association is represented with a coefficient of zero. There is no trend in either direction for the other variable as the first variable continues to climb and it could either increase or decrease. When the value is in between 0 and +1/-1, there is a relationship, but the points do not all fall on a line. As  $r$  approaches -1 or 1, the strength of the relationship increases, and the data points tend to fall closer to a line. Weak correlations exist towards  $\pm 0.5$ , and correlation becomes strong towards  $\pm 1$ . In the table 4.6,  $r=0.671$ , and this value lies between 0 and +1 but closer to +1 than 0 (zero). Therefore, there is statistically significant positive and strong correlation between flexible learner progressions and completion rates ( $r=0.671$ ,  $p=0.000$ ). This implies that there is efficient evidence to reject the null hypothesis  $H_{01}$  and conclude that the relationship between flexible learner progressions and completion rates exists in the NPs in Kenya.

Therefore, the null hypothesis which stated that there is no statistically significant relationship between flexible learner progression and trainees' completion rates in National Polytechnics in Kenya was rejected at 0.05 level of significance. The alternative hypothesis which implies that there is statistically significant relationship between flexible learner progression and trainees' completion rates in National Polytechnics in Kenya was therefore upheld. Based on the findings, a conclusion was made that flexible learner progression influences and trainees' completion rates in National Polytechnics in Kenya.

#### 4.1.5 Chi-Square test of Association

Pearson chi-square test of independence was also conducted to establish whether there was significant association between flexible learner progression and completion rates in National Polytechnics in Kenya. The Chi-square test of association is made to evaluate the relationship between two categorical values. The chi-square test of association or independence has two hypotheses, null and alternative hypothesis. The null hypothesis asserts that there is no relationship between two categorical variables. In interpreting the chi-square results, if the p-value is less than or equal to the significance level (in this study set at 0.05), then there is evidence that leads rejecting the null hypotheses, and conclusion is made that the two categorical variables have statistically significant association/correlation. The results of Chi-square test of analysis are shown in Table 4.6.

**Table 4.6: Flexible learner progression and Completion rate Cross tabulation**

|                              | Value               | Df | p-value |
|------------------------------|---------------------|----|---------|
| Pearson Chi-Square           | 85.566 <sup>a</sup> | 24 | 0.000   |
| Likelihood Ratio             | 86.530              | 24 | 0.000   |
| Linear-by-Linear Association | 31.158              | 1  | 0.000   |
| N of Valid Cases             | 85                  |    |         |

a. 30 cells (85.7%) have expected count less than 5. The minimum expected count is .12.

According to the findings, there was statistically significant association between ( $\chi^2(24) = 85.56$ ,  $p < .000$ ). Since the p-value (0.00) is less than the significance level or the alpha statistic (0.05), therefore the results

imply that flexible learner progress is a good predictor of completion rates in National Polytechnics education in Kenya. Therefore, the null hypothesis that there is no significant association between flexible learner progression and completion rates is rejected and concluded that there is significant association between flexible learner progression and completion rates ( $\chi^2=85.566$ ,  $df=24$ ,  $p<0.000$ ). This confirms the results of correlation analysis depicted in Table 4.6, which shows that, the more flexible a program is in terms of learner progression, then the higher the completion rates in National Polytechnic in Kenya.

#### 4.1.6 Regression Analysis

The variables flexible learner progression and completion rates were modeled using simple regressions and the relationship equations between flexible learner progression and completion rates was determined. Tables 4.7 presented an overview of the strategy based on the outcomes of a data regression analysis. Table 4.7 displays the R value, which represents the degree to which flexible learner progression and completion rate are correlated, and the  $R^2$  value, which represents the effect of flexible learners' progression on completion rates, were presented.

**Table 4.7: Model summary of flexible learner progression and completion rates**

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1     | .671 <sup>a</sup> | .451     | .445              | 5.66004                    |

a. Predictors: (Constant), Flexible learner progression

According to the results shown on table 4.7, flexible learner progression was associated with 45.1% change/variance in completion rates (R square column value of 0.451, multiplied by 100 (percentage)). This can be also explained as that, about 45.1% change in completion rates was influenced by flexible learning progression.

#### Equation of the model

The equation of the model is obtained from the values shown in Table 4.10. The regression equation takes the general form:

$$y = \beta_0 + \beta_1 \chi_1 + \beta_2 \chi_2 \dots + \beta_n \chi_n + \varepsilon$$

Where;

y = dependent variable, in this case, completion rates in National Polytechnics in Kenya

$\beta_i$ ,  $i=1, 2, \dots, n$  are the coefficients and of the independent variable, in this case, flexible learner progression and  $\varepsilon$  is the error term

**Table 4.8: Regression Coefficients and Statistical Significance**

| Variable                           | Constant | B         | p-value |
|------------------------------------|----------|-----------|---------|
| Flexible learner progression (FLP) | 58.23524 | 1.3879582 | 0.0000  |

**Key: FLP – Flexible Learner Progression**

#### Simple Regression:

Therefore, the simple regression equation is as follows:

$$\text{Completion rates (y)} = 58.23524 + 1.3879582 * \text{FLP} \dots\dots\dots (i)$$

The equation (i) implies that for a unit increase in flexible learner progression, then the completion rates increase by 1.4 times (p-value 0.000). This implies that flexibility of modular programs in terms of learner progression tend to increase completion rates. The results indicated that correlation/relationship between flexible learner progression and completion rates is positive and statistically significantly correlated, hence, any unit change in flexible learner progression may result to increased completion rates by 1.4 times.

## V. Discussion and Interpretation of Research Findings

### 5.1 Flexible Learner Progression and Completion Rates in National Polytechnics in Kenya

The first objective of this study was to determine the influence of flexible learner progression on completion rates in TVET. As shown in Table 4.1 and 4.2 respectively, the study findings revealed that majority 75 (80.6%) of the HODs and trainees agreed that designing programs in line with consumer needs promoted access and completion of courses, individualized teaching/learning enhances completion rates 72(77.40%) while

multiple entry points actualized through the module approach created opportunities for disadvantaged trainees to join the system after dropping out enhancing completion rates in National Polytechnics.

From the correlation and regression analysis, it was established that flexible learner progression was associated with statistically significant association/influence on completion rates. As shown in Table 4.8, correlation analysis indicated that there was strong significant positive correlation ( $r=0.671$ , sig. 0.00) between flexible learner progression and completion rates. Further, flexible learner progression was associated with 45.1% change/variance in completion rates and that a unit change in flexible learner progression would result to increased completion rates by 1.4 times. These findings collaborate with previous scholarly studies. For instance, Staisloff & Donna (2021) established significant statistical correlation between flexible training programs and completion rates. The authors noted that flexible training programs give learners the chance to expand their skills and apprenticeships in a way that allows learners to participate at various educational levels at various periods and gives them the chance for continuous learning.

Similarly, this current study findings share similarity with the findings by Sadiq and Zamir (2020) who found that vocational education ought to include structural flexibility to allow various programs to be structured on customers' (student's) needs to increase effectiveness. Both studies agree that the TVET training should be able to rapidly and persistently modify or upgrade in light of current integration processes and socio-economic complexities in order to accommodate the ever-shifting circumstances of life, personal qualities, and needs of the students, thereby maximizing the program's potential to provide a flexible experience. A flexible education system facilitates student transition from one level to another.

Further, these results are consistent with those found in the literature by Nsabimana (2022), who carried out an investigation on the factors that influence the adoption of adaptable teaching methods in Kenya's technical training centers and found that such strategies increase services by offering students control and flexibility over what and how they gain knowledge, empowering them to assume accountability for their own learning, and catering support to their unique needs. The study findings are consistent with available literature by Neal (2011) who identified traditional delivery approach limited completion rates in TVET education through limited physical facilities, location and operating hours among other factors presenting barriers to many prospective clients. Available literature observe that flexible delivery approach has the ability to make TVET education cost effective, time efficiency, provided for individual learning differences, flexible access to training resources among other factors promoting completion rates. The training approaches can increase learner and trainer choice in delivery options, providing the trainees with learning opportunities comprised of full-time and part-time options.

On the contrary, out of a sample of 93 HoDs, 66.7% and 63.4% were undecided on whether multiple pathways and flexible learning programs in National Polytechnics reduced dropout rates increasing completion rates in National Polytechnics agreeing with earlier literature by Staisloff & Donna (2021) who observed that flexible delivery approaches were a fallacy since Trainers had no authority to develop their own courses tailor-made to suit a specific need in the market or even reorganize existing syllabi and institutions had to depend on set delivery approaches at national level. In Kenya, for example, the Kenya Institute of Curriculum Development (KICD) dictates all program structures, period dates, material delivery modalities, and assessment and accreditation processes, leaving minimal room for National Polytechnics to develop limited programmes and no room for other TVET Institutions, instructor and student preferences.

Further, Tiony et al (2021) observed that the training approach can only be efficient where there is commitment by the Government, Education Planners and administrators to manage the change and design suitable systems. Similarly, both studies agree on the need to train trainers/trainees on using flexible methods to take up the challenges of self-directed flexible learning for increased productivity. The findings address the challenges facing flexible learner progression by guiding policy review on the level of flexibility of the modules, the connectivity of the modules, the cost per module, the duration, structure and sustainability of the training approach enhancing completion rates in National Polytechnics.

## **VI. Conclusion and Recommendations**

From the findings, it can be inferred that; flexible learner progression has the most significant influence on trainee's completion rates. Designing programs in line with consumer needs promotes inclusiveness since it assists vulnerable and disadvantaged groups particularly women and the poor to access learning by establishing multiple entry points enhancing completion of courses in National Polytechnics in Kenya. According to the data, completion Rates in TVET in Kenya was determined by learners' flexible progression. Data revealed that there was statistically significant relationship between flexible learner progression and completion rates in TVET in Kenya. Based on the findings, a conclusion was made that flexible learner progression highly influenced trainees' completion rates in National Polytechnics in Kenya and by inference in Technical Vocational Education Training institutions in Kenya.

**The study makes the following recommendations.**

- i. The Government, Educational Planners and Administrators to come up with necessary policies to manage the module delivery approach and design suitable systems that offer opportunities for the adoption of flexible formats of learning in National Polytechnics,
- ii. The Government should establish a monitoring body/agency to help TVET Institutions in the adaptation and implementation of flexible delivery approaches in National Polytechnics in Kenya.
- iii. The study recommends the Government and the TVET Management and stakeholders to upgrade the resources to aid effective implementation of flexible training which needs more physical and human capital.

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