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RESEARCH ARTICLE

TRAINERS' CONTINUOUS PROFESSIONAL DEVELOPMENT AND STUDENTS LEARNING OUTCOMES IN TVET INSTITUTIONS

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Abstract

The study sought to establish the influence of Continuous Professional Development (CPD) programs on students' learning outcomes in Technical and Vocational Education and Training (TVET) institutions in Ruhango District, Rwanda. The study aimed to determine the influence of CPD programs on course completion rates, acquisition of practical skills and competencies and students' participation/engagement among TVET students. Using cross-sectional research design with mixed methods, data were collected from a sample of 427 respondents, including instructors, headteachers, and Sector Education Inspectors (SEIs). Simple random sampling was used for schools and instructors, while headteachers and SEIs were selected through purposive sampling. Quantitative data were analyzed using frequency percentages and correlation analysis, while qualitative data were processed through thematic analysis. The findings revealed that CPD programs significantly enhance student learning outcomes in TVET institutions. A majority of respondents (80%) participated in CPD initiatives, with 65% reporting that CPD had a strong influence on improving course completion rates, and 85% highlighting its positive impact on the acquisition of practical skills and competencies. Additionally, 60% of respondents recognized a substantial influence of CPD on student engagement. Correlation analysis confirmed strong positive relationships between CPD and course completion ($r = 0.72$), practical skills acquisition ($r = 0.85$), and student engagement ($r = 0.72$). The study concluded that CPD programs play a critical role in improving educational outcomes in TVET institutions. Recommendations include tailoring CPD programs to specific technical fields, enhancing hands-on workshops, providing more frequent CPD opportunities, and implementing structured monitoring and evaluation mechanisms. Future research should explore the influence of CPD on specific technical skills and examine its long-term impact on both instructors and students.

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Introduction:-

Technical and Vocational Education and Training (TVET) is increasingly recognized as a crucial element in fostering economic development and addressing global skills gaps (UNESCO, 2020). In this context, Continuous Professional Development (CPD) programs play a vital role in enhancing the effectiveness of TVET instructors by

equipping them with the skills and knowledge needed to improve student learning outcomes (Smith & Johnson, 2018). CPD programs, ranging from workshops to mentorship, aim to enhance teaching practices, ensuring that educators can deliver relevant and high-quality education to their students.

Globally, CPD programs have been shown to positively influence various aspects of education, such as student participation, engagement, and course completion rates. In the United States, CPD initiatives have leveraged technology and interactive learning strategies to promote active learning in TVET (U.S. Department of Education, 2020). Similarly, in Europe, cross-border collaborations through programs like Erasmus have enriched CPD programs, contributing to improved course completion rates and student engagement (European Commission, 2017). In Asia, countries like Singapore and South Korea have emphasized industry-aligned CPD initiatives, which have helped reduce dropout rates and improve student competencies (Ministry of Education, Singapore, 2018).

In Africa, including Rwanda, TVET is seen as a key driver of socioeconomic development. The Rwandan government has implemented extensive reforms in the TVET sector, emphasizing the importance of CPD for instructors as part of its broader national education strategy (Rwanda Ministry of Education, 2018). These initiatives aim to improve the quality and relevance of TVET education by fostering competency-based learning and promoting industry partnerships. However, despite these efforts, the impact of CPD on student learning outcomes in Rwandan TVET institutions remains under-researched, particularly in areas such as course completion, skills acquisition, and student engagement.

This study aimed to fill this gap by examining the influence of CPD programs on student learning outcomes in TVET institutions in Rwanda, focusing specifically on Ruhango District. By exploring how CPD impacts course completion rates, practical skills acquisition, and student engagement. The study sought to provide evidence-based insights that can guide policy and practice improvements in the TVET sector.

The primary objective of the study was to assess the influence of CPD programs on student learning outcomes in TVET institutions. Specifically, it aimed to:

1. Determine the influence of CPD programs on course completion rates among TVET students.
2. Determine the influence of CPD programs on the acquisition of practical skills and competencies among TVET students.
3. Determine influence of CPD programs on students' participation/engagement in TVET courses.

Literature Review:-

Introduction

Continuous Professional Development (CPD) is essential for improving teacher competencies and student outcomes, especially in Technical and Vocational Education and Training (TVET) institutions. This review explores the theoretical foundations and empirical evidence regarding the influence of CPD on course completion rates, acquisition of practical skills, and student engagement.

Theoretical literature

Several theories underpin the relationship between CPD and student learning outcomes. **Social** Cognitive Theory (Bandura, 1977) emphasizes that learning occurs through observation, imitation, and modeling, suggesting that CPD programs enhance student outcomes by equipping teachers with new strategies that students can observe and emulate. Self-Determination Theory (Deci & Ryan, 2017) further highlights how CPD can enhance student motivation by promoting autonomy, competence, and relatedness, leading to improved persistence and engagement.

CPD and Course Completion Rates

Research shows a strong link between CPD and increased course completion rates. Smith et al. (2018) found that CPD interventions fostering autonomy and competence significantly enhanced students' intrinsic motivation, boosting persistence and course completion. Similarly, Johnson and Lee (2020) noted that CPD programs utilizing feedback and mastery experiences improved students' self-efficacy, enabling them to overcome academic challenges and complete their courses. These findings underscore the role of CPD in fostering a supportive learning environment that leads to course completion.

CPD and Acquisition of Practical Skills

CPD programs are particularly impactful in enhancing the practical skills of TVET students. Lee and Kim (2019) observed that students taught by CPD-trained instructors demonstrated higher proficiency in industry-relevant skills. Brown et al. (2021) corroborated these findings, showing that CPD programs focused on competency-based training significantly improved students' practical competencies. This indicates that CPD not only benefits theoretical knowledge but also the hands-on skills necessary for technical fields.

CPD and Student Engagement

Effective CPD also promotes student engagement by fostering innovative and interactive teaching practices. Research by Davis and Clark (2020) found that teachers who participated in CPD employed more dynamic and engaging pedagogical strategies, resulting in higher student participation. Additionally, Nguyen and Tran (2022) noted that CPD programs emphasizing technology integration and modern teaching methods significantly enhanced student engagement, further supporting the importance of CPD in creating interactive learning environments.

Research Gaps

While existing studies demonstrate a positive correlation between CPD and student outcomes, gaps remain in understanding the specific mechanisms through which CPD impacts course completion, skills acquisition and engagement particularly in the context of African TVET institutions. Additionally, most research focuses on individual aspects of CPD, with limited exploration of how CPD influences multiple student outcomes simultaneously. This study seeks to address these gaps by examining the combined effects of CPD on course completion, practical skills acquisition, and student engagement in Rwandan TVET institutions.

Research Methodology:-

Research Design

A cross-sectional survey design was utilized to examine the influence of Continuous Professional Development (CPD) on student learning outcomes in Technical and Vocational Education and Training (TVET) institutions. This design enabled the collection of data at a single point in time, capturing the current state of CPD impacts across a broad population (Creswell, 2018).

Target Population

The target population comprised 427 participants, including 401 trainers, 17 headteachers, and 9 Sector Education Inspectors (SEIs) from TVET institutions in Ruhango District. Trainers were included for their direct involvement in CPD implementation, while headteachers and SEIs provided insights on CPD program supervision and its effects on course completion, skills acquisition, and student engagement.

Sampling Techniques

A combination of simple random sampling and purposive sampling was used. Twelve TVET institutions were selected randomly, along with their headteachers, who automatically became part of the sample. Trainers were also chosen using simple random sampling to ensure representation. SEIs were selected purposively due to their specialized knowledge and supervisory roles (Palinkas, 2019).

Sample Size

Using Yamane's formula, the sample size was calculated as follows:

$$n = \frac{427}{1 + 427(0.05)^2} = 200$$

$$n = \frac{N}{1 + N(e)^2}$$

n: is the sample size

N: represents the population size

e: Margin of error (e= 0.05)

The final sample comprised 183 trainers, 12 headteachers, and 5 SEIs, as detailed in

Table 3.1.

Table 3.1:- Target population and sample size.

	Population size	Sample size
Trainers	401	183
Head teachers	17	12

SEI	9	5
Total	427	200

Source: Ruhango District Education office 2024

Research Findings and Discussion

Introduction

The study investigated the relationship between Continuous Professional Development (CPD) programs for trainers and student learning outcomes in Technical and Vocational Education and Training (TVET) institutions. With a complete response rate of 100% from 183 instructors, 12 head teachers and 5 Sector Education Inspectors, the findings offer valuable insights into the impact of CPD on educational practices and student learning outcomes.

Demographic Characteristics

The demographic profile of respondents indicated a balanced gender representation (49.5% male and 50.5% female), which supports diverse perspectives on CPD's effectiveness. The majority of instructors were aged 25-44, highlighting a vibrant and mid-career workforce that is likely to drive innovative teaching practices. Furthermore, a significant portion (63%) of respondents possessed over five years of experience, suggesting that the insights gathered are rooted in substantial professional expertise.

Influence of CPD Programs on Student Learning Outcomes

Course Completion Rates

The majority of respondents (65%) acknowledged a strong influence of CPD on course completion rates. This finding aligns with literature indicating that well-structured CPD initiatives equip educators with contemporary pedagogical techniques that enhance teaching quality (Smith et al., 2018). Notably, a correlation coefficient of ($r=0.72$) underscores a robust relationship between CPD participation and course completion, reinforcing the notion that effective CPD can significantly elevate student success rates.

Acquisition of Practical Skills

An impressive 62% of trainers rated CPD as having a very high influence on the acquisition of practical skills. This finding reflects the essence of TVET education, which focuses on equipping students with hands-on competencies for the workforce. The correlation of CPD with technical skills acquisition ($r=0.85$) illustrates the critical role CPD plays in ensuring practical skills acquisition.

Student Engagement

The study found that 60% of respondents reported a positive impact of CPD programs on student engagement. Factors contributing to increased participation included interactive teaching methods (70%) and improved classroom dynamics (60%). The correlation coefficient of ($r=0.72$) between CPD and student engagement further supports the conclusion that CPD enhances the educational experience, fostering environments where students are more likely to engage actively in their learning.

Implications of Findings

The findings suggest several important implications for TVET institutions and policymakers. First, investing in comprehensive CPD programs can substantially enhance instructional quality, thereby improving student learning outcomes. Institutions should prioritize CPD that emphasizes interactive teaching methods and aligns with industry trends to meet the evolving needs of students and employers.

Limitations and Future Research:-

While the study provided significant insights, it is essential to recognize limitations such as the potential for response bias and the focus on a single district. Future research could expand the scope to include a more diverse range of institutions and examine the long-term impacts of CPD on student learning outcomes.

Conclusions:-

The study concludes that CPD programs significantly influence student learning outcomes in TVET. CPD results to increase course completion rates, practical skill acquisition, and student engagement. CPD programs contribute to higher course completion rates by improving teaching methods and providing better support for student and CPD

programs are highly effective in enhancing the technical and soft skills (problem-solving, communication, and teamwork) required for TVET students' success in the workforce. Moreover, CPD programs encourage interactive and innovative teaching methods, resulting in higher levels of student participation and engagement.

Recommendations:-

Based on the conclusions drawn from the findings, the study makes following recommendations:

1. CPD programs should be tailored to specific technical fields within TVET institutions to address the distinct needs of different courses and industries.
2. More practical, hands-on workshops should be integrated into CPD programs to further enhance instructors' ability to teach relevant practical skills
3. There is a need for more frequent and accessible CPD opportunities to ensure that all instructors, especially those with less experience, can benefit from these programs.
4. TVET institutions should implement more structured monitoring and evaluation mechanisms to continually assess the effectiveness of CPD programs on student learning outcomes.

Suggestions for Further Study:-

The study suggests the following areas for further research:

Future research could focus on influence of CPD programs influence on development of specific technical skills in various TVET fields such as engineering and ICT.

Longitudinal on the impact of CPD programs on both instructors and students would provide insights into the sustained effectiveness of these initiatives.

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