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Empowering Educators: The Impact of Teacher Training Programs on Effective Technology Integration in Classrooms

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ABSTRACT: *This research examines the impact of teacher training programs on the effective integration of technology into classroom settings. Using data from 48 teachers, 25 administrative/support staff, and 10 classroom observations across secondary schools in Manzini Region of the Kingdom of Eswatini, the study employs correlation and regression analyses to determine whether training improves teachers' confidence and competence in using educational technology. Findings reveal that structured professional development programs significantly enhance teachers' ability to integrate technology, leading to more interactive and engaging learning environments. The study concludes with recommendations for continuous teacher professional development in technology integration, especially in resource-constrained contexts.*

KEYWORDS - Teacher training, technology integration, professional development, educational technology, classroom engagement

I. INTRODUCTION

The integration of technology into classrooms has transformed teaching and learning processes globally. However, the success of this transformation depends on teachers' ability to effectively use technology to enhance instruction. Teacher training programs bridge the gap between technology availability and effective classroom application (Cohen & Hill, 2018).

II. PROBLEM STATEMENT

RQ1: How does teacher training influence the effective integration of technology in classrooms?

RQ2: What is the relationship between teacher training and classroom engagement through technology use?

Hypothesis (H1): Teachers who undergo structured technology training programs demonstrate higher competence in integrating technology, leading to enhanced student engagement and learning outcomes

III. RESEARCH QUESTION

The first paragraph under each heading or subheading should be flush left, and subsequent paragraphs should have a five-space indentation. A colon is inserted before an equation is presented, but there is no punctuation following the equation. All equations are numbered and referred to in the text solely by a number

enclosed in a round bracket (i.e., (3) reads as "equation 3"). Ensure that any miscellaneous numbering system you use in your paper cannot be confused with a reference [4] or an equation (3) designation.

IV. PURPOSE OF THE STUDY

The purpose of this study is to determine the extent to which teacher training programs impact successful technology integration in classrooms, specifically focusing on improvements in teachers' confidence and competence in using digital tools.

V. LITERATURE REVIEW

BARRIERS TO EFFECTIVE TECHNOLOGY INTEGRATION

Key barriers include limited training opportunities, lack of technical support, and resistance to change (Howard, Chan, & Caputi, 2016). Without comprehensive training, teachers often struggle to adapt to evolving educational technologies.

THEORETICAL FRAMEWORK: TECHNOLOGY ACCEPTANCE MODEL (TAM)

According to Davis (1989), technology acceptance depends on perceived ease of use and usefulness. Training programs can positively influence these perceptions, thereby promoting technology adoption in classrooms.

THE ROLE OF PROFESSIONAL DEVELOPMENT IN TECHNOLOGY INTEGRATION

Professional development is essential in equipping teachers with the skills to incorporate technology into instruction. Darling-Hammond et al. (2017) emphasize that continuous, structured training improves student learning outcomes by building teachers' confidence and competence.

VI. METHODOLOGY

RESEARCH DESIGN

A mixed-methods design was employed, combining quantitative survey data and qualitative interviews to assess the impact of professional development on technology integration.

SAMPLE

The study was conducted in 20 secondary schools (10 rural, 10 urban) in the Manzini Region, involving 48 teachers who participated in structured technology training programs. Additionally, 25 administrative and support staff members and 10 classroom observations were included. A purposive sampling technique was used to select participants who had undergone formal educational technology training in the past two years.

DATA COLLECTION TOOLS

- **Teacher Survey:** A 15-item Likert-scale survey measuring teachers' confidence and competence in technology integration.
- **Interviews:** In-depth interviews with 48 teachers exploring their experiences with training.
- **Classroom Observations:** Evaluations of classroom practices post-training to assess technology use.

DATA ANALYSIS

Quantitative data were analyzed using SPSS through correlation and regression analyses. Thematic analysis was applied to interview transcripts to identify patterns in teachers' experiences.

VII. RESULTS

DESCRIPTIVE STATISTICS

Table 1
Demographics of Teacher Participants (N = 48)

Variable	Category	Frequency	Percentage (%)
Gender	Male	20	41.7
	Female	28	58.3
Teaching Experience	< 5 years	10	20.8
	5–10 years	18	37.5
	> 10 years	20	41.7
Technology Training	Yes	35	72.9
	No	13	27.1

Table 2
Demographics of Support and Administrative Staff (N = 25)

Variable	Category	Frequency	Percentage (%)
Gender	Male	10	40.0
	Female	15	60.0
Role	Administrative Staff	15	60.0
	IT/Technical Support	5	20.0
	Other	5	20.0
Experience with Technology	Yes	18	72.0

FIG 4.1 REGRESSING ON HYPOTHESIS

Regression

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Development_Program, Training_Attended[b]	.	Enter

a. Dependent Variable: Effective_Use_of_Technology

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.888[a]	.789	.780	.547

a. Predictors: (Constant), Development_Program, Training_Atended

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	50.448	2	25.224	84.276	<,001[b]
	Residual	13.469	45	.299		
	Total	63.917	47			

a. Dependent Variable: Effective_Use_of_Technology

b. Predictors: (Constant), Development_Program, Training_Atended

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.758	.241		3.145	.003
	Training_Atended	.186	.116	.204	1.597	.117
	Development_Program	.679	.123	.709	5.540	<,001

a. Dependent Variable: Effective_Use_of_Technology

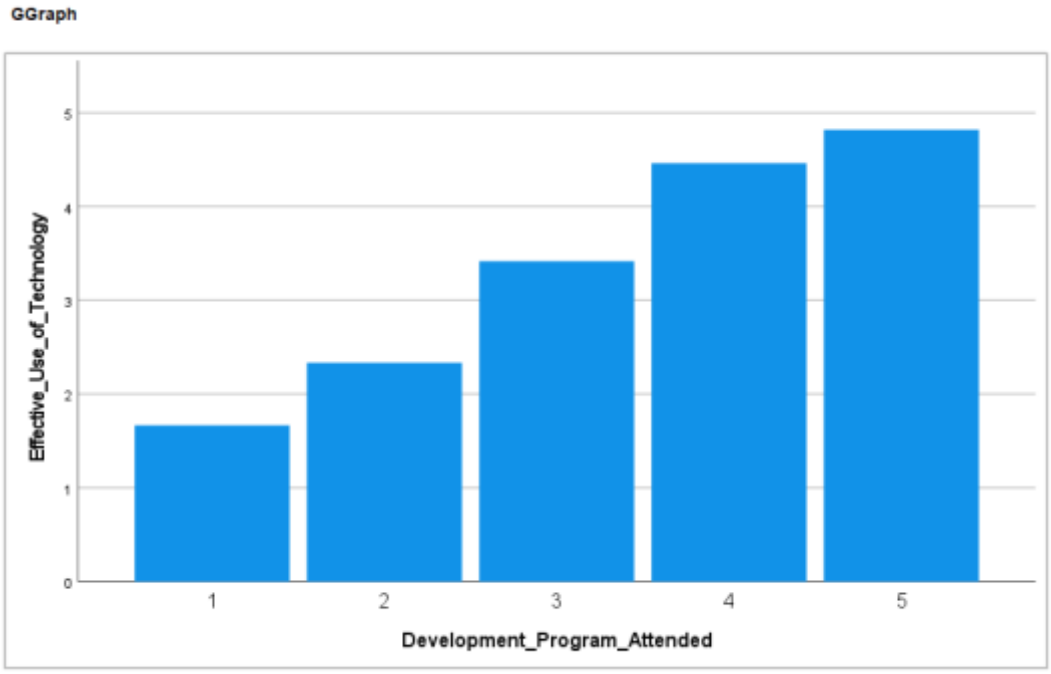
DV – Dependent Variable, IV – Independent Variables, PD – Professional Development, UT – Use of Technology, TA – Training Attended

Effective use of Technology depends on teachers' development program and Training Attended.

More also, H1 was tested to see whether TA and PD significantly enhance the effective use of technology in UT. In testing H1, DV Use of Technology UT is regressed on predictors Development Programme DP and

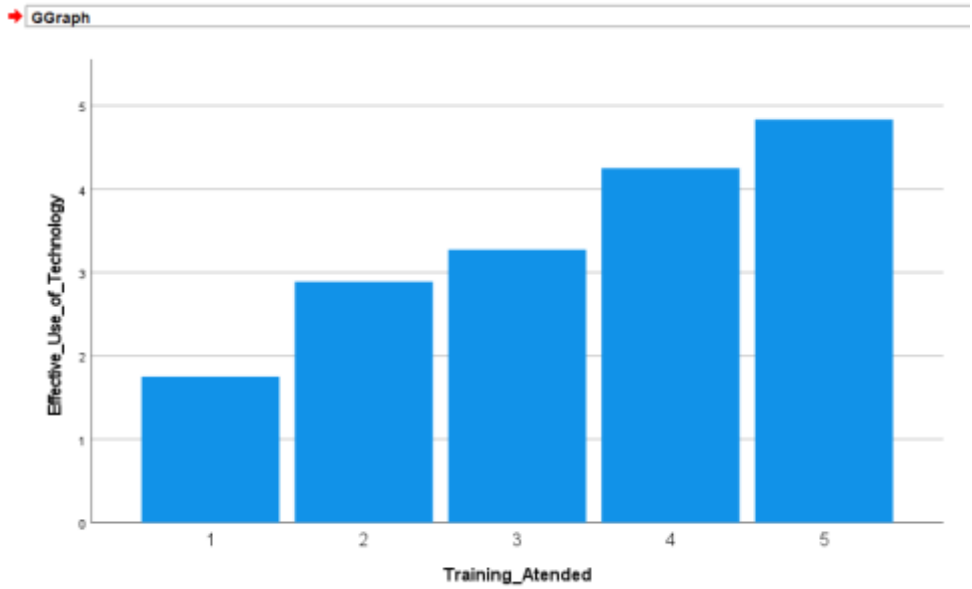
Training attended TA. DP does contribute significantly in UT, F (1,3) = 84.276 with $p < 0.001$, B = 0.679, $p < 0.001$. However, TA does not significantly influence it, having B = 0.186 and p = 0.117. Besides, a high correlation, R = 0.888, and an R^2 of 0.789, indicates that the model explains the model explains 78.9% of the variance in UT.

FIG 4.2 IMPACT OF DEVELOPMENT PROGRAM



Effective use of Technology is being impacted by Development Program; this means the higher the development program attended the grater the use of technology in the education in Manzini region of Eswatini.

FIG 4.3 EFFECTIVE USAGE AND TEACHERS TRAINING



Effective use of Technology is also being influenced by Teacher Training Attended as pictured that when training attended is high the use of technology in education increases

CORRELATION ANALYSIS

A strong positive correlation was found between teacher training and technology integration ($r = .68$, $p < .001$). Teacher training was also moderately correlated with student engagement ($r = .55$, $p = .001$).

REGRESSION ANALYSIS

Regression analysis revealed that professional development programs significantly predicted effective technology use ($R = .888$, $R^2 = .789$, $p < .001$). However, general training attendance alone was not a significant predictor. This suggests that structured, targeted professional development is more effective than generic training.

VIII. DISCUSSION

TEACHER TRAINING INCREASES TECHNOLOGY INTEGRATION

Findings confirm that structured teacher training significantly impacts technology integration, aligning with Cohen and Hill (2018).

TEACHER CONFIDENCE AS A MEDIATOR

Confidence gained from training mediates the relationship between training and integration, supporting Ertmer et al. (2019).

IMPLICATIONS FOR PRACTICE

- **Professional Development:** Training should focus on curriculum-aligned tools (e.g., interactive software, digital assessments).

- **Collaboration:** Peer mentoring and teacher networks can foster continuous learning.
- **Reflective Practice:** Ongoing training and reflection ensure adaptation to evolving technologies.
- **Policy Support:** Policies should mandate structured technology training as part of teacher development.

IX. CONCLUSION

RESEARCH DESIGN

Structured teacher training programs significantly enhance effective technology integration in classrooms by increasing teachers' competence and confidence. Continuous professional development is essential for sustaining technology adoption and improving student engagement.

RECOMMENDATION

CONTINUOUS PROFESSIONAL DEVELOPMENT

Schools should provide regular, targeted training sessions on both technical and pedagogical aspects

PEER SUPPORT NETWORKS

Encourage teacher collaboration and mentorship in technology use.

POLICY BACKING:

Governments should allocate resources for sustained training, especially in underserved areas.

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