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RESEARCH ARTICLE

Section: *Education*

Effectiveness of total physical response integration in enhancing communication and collaboration competencies: A quasi-experimental study among Grade 3 learners in Kenya

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Correspondence: afandivivian@gmail.com**ABSTRACT**

Contemporary educational frameworks emphasize communication and collaboration as essential 21st-century competencies, yet traditional teaching methods often inadequately develop these complex skills among young learners. To evaluate the effectiveness of integrating Total Physical Response in enhancing communication and collaboration competency in English oral skills lessons among Grade 3 learners in Kakamega County, Kenya. A quasi-experimental design involved 116 Grade 3 learners (58 experimental, 58 control) from public primary schools. Experimental group received TPR-integrated instruction over four weeks. Competency assessment utilized a validated rubric measuring six dimensions: verbal expression, active listening, non-verbal communication, peer interaction, group participation, and conflict resolution. Experimental group demonstrated statistically significant improvements across all competency dimensions ($p < 0.001$) with large to very large effect sizes (Cohen's $d = 1.19-1.71$). Verbal expression improved by 1.1 points (52% increase), non-verbal communication by 1.4 points (70% increase), and collaboration competencies by 1.1-1.3 points (65-72% increases). TPR integration significantly enhances both communication and collaboration competencies among Grade 3 learners, demonstrating effectiveness in developing integrated 21st-century skills essential for contemporary educational success.

KEYWORDS: Total Physical Response, communication competency, collaboration competency, effectiveness, primary education

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1. Introduction

Contemporary primary education faces the challenge of developing communication and collaboration competencies within multilingual contexts where learners must acquire essential 21st-century skills while navigating complex linguistic landscapes. Kenya's Competency-Based Curriculum framework emphasizes these competencies as core objectives, yet many Grade 3 learners struggle with verbal expression, active listening, and collaborative problem-solving in English.

Traditional teaching methodologies often fall short in developing the dynamic, interactive competencies that modern frameworks prioritize. Teacher-centered approaches typically provide limited opportunities for authentic communication practice or collaborative skill development, resulting in learners who possess linguistic knowledge but struggle with practical application in social contexts.

Total Physical Response (TPR) methodology presents unique opportunities for comprehensive competency development through coordinated physical movement, social interaction, and authentic communication needs. Unlike traditional approaches that isolate language skills, TPR activities naturally integrate multiple competency dimensions while creating engaging experiences that accommodate diverse learning preferences.

The Kenya National Examinations Council reports that only 42% of Grade 3 learners demonstrate adequate oral communication skills, highlighting the urgent need for evidence-based instructional approaches that can effectively develop communication and collaboration competencies within existing educational constraints.

This study addresses the critical gap in understanding how TPR integration affects comprehensive competency development among young learners in multilingual African educational contexts.

2. LITERATURE REVIEW

2.1 Communication and Collaboration Competency Development

Communication competency encompasses verbal expression clarity, active listening skills, and non-verbal communication effectiveness. Research demonstrates that effective communication development requires integrated approaches addressing linguistic, social, and cognitive dimensions simultaneously (Hogan et al., 2014). Studies in multilingual contexts reveal particular challenges where learners acquiring English as additional language often struggle with confidence barriers and limited authentic practice opportunities.

Collaboration competency involves complex social skills including peer interaction effectiveness, group participation quality, and conflict resolution capabilities. Johnson and Johnson (2014) identify collaboration as foundational 21st-century skill requiring explicit instruction and systematic practice opportunities. Research reveals that effective collaboration development requires structured environments promoting positive interdependence and individual accountability.

2.2 Total Physical Response and Competency Development

Asher's (1977) TPR methodology emphasizes coordinated physical movement and verbal instruction for language acquisition. Contemporary research has expanded understanding of TPR's applications beyond traditional language learning to broader competency development. García-Neves et al. (2019) demonstrate TPR's effectiveness in developing communication confidence among young learners, while Chen and Li (2019) reveal particular effectiveness in multilingual contexts where physical demonstration provides additional comprehension support.

2.3 Assessment of Complex Competencies

Traditional assessment approaches prove inadequate for capturing dynamic, interactive competencies. Darling-Hammond and Adamson (2014) advocate for performance-based approaches examining competency demonstration in authentic contexts. Competency-based assessment requires rubric development capturing multiple skill dimensions while providing reliable measurement across diverse populations.

3. METHODOLOGY

3.1 Research Design and Participants

This study employed a quasi-experimental design with pre-test/post-test control group structure involving 116 Grade 3 learners (58 experimental, 58 control) and 8 teachers from public primary schools in Kakamega County, Kenya. Schools were selected through multi-stage sampling across four sub-counties representing diverse geographical contexts. Random assignment occurred at school level to prevent contamination between conditions.

3.2 Intervention and Assessment

The experimental group received TPR-integrated English oral skills instruction over four weeks with daily 40-minute lessons incorporating systematic kinesthetic activities. Control group continued traditional instruction

using conventional approaches. A comprehensive competency assessment rubric measured six dimensions: verbal expression, active listening, non-verbal communication, peer interaction, group participation, and conflict resolution using four-point scales from Beginning to Advanced levels.

3.3 Data Collection and Analysis

Pre-intervention assessment occurred during Week 1 through individual 15-minute sessions, with post-intervention assessment following identical procedures during Week 6. Quantitative analysis employed descriptive statistics, independent samples t-tests, paired samples t-tests, and ANCOVA controlling for baseline differences. Effect sizes were calculated using Cohen's d to determine practical significance.

4. RESULTS

4.1 Sample Characteristics and Baseline Equivalence

Participant demographics showed balanced representation across gender (52.6% female, 47.4% male) and age distributions (mean = 8.4 years, SD = 0.7). Language background analysis revealed 34.5% speaking English as first language, 28.4% Kiswahili, and 37.1% indigenous languages. Independent samples t-tests confirmed no significant baseline differences between experimental and control groups across all demographic variables and pre-test competency scores (all $p > 0.05$).

4.2 Communication Competency Development

Table 1 presents comprehensive analysis of communication competency improvements across experimental and control groups. All communication dimensions demonstrated statistically significant experimental group advantages with large to very large effect sizes.

Table 1

Communication Competency Development: Pre-test to Post-test Changes

Competency Dimension	Group	Pre-test M (SD)	Post-test M (SD)	Change M (SD)	t-value	p-value	Cohen's d
Verbal Expression	Experimental	2.1 (0.6)	3.2 (0.5)	1.1 (0.7)	12.15	< 0.001	1.59
	Control	2.0 (0.7)	2.3 (0.6)	0.3 (0.4)	5.82	< 0.001	0.76
Active Listening	Experimental	1.9 (0.5)	2.8 (0.6)	0.9 (0.6)	11.43	< 0.001	1.50
	Control	1.8 (0.6)	2.1 (0.5)	0.3 (0.4)	5.74	< 0.001	0.75
Non-verbal Communication	Experimental	2.0 (0.7)	3.4 (0.6)	1.4 (0.8)	13.42	< 0.001	1.76
	Control	1.9 (0.6)	2.2 (0.7)	0.3 (0.5)	4.58	0.028	0.60

4.3 Collaboration Competency Enhancement

Table 2 demonstrates substantial experimental group advantages across all collaboration competency dimensions, with effect sizes ranging from large to very large.

Table 2

Collaboration Competency Development: Pre-test to Post-test Changes

Competency Dimension	Group	Pre-test M (SD)	Post-test M (SD)	Change M (SD)	t-value	p-value	Cohen's d
Peer Interaction	Experimental	1.8 (0.6)	3.1 (0.7)	1.3 (0.8)	12.38	< 0.001	1.62
	Control	1.7 (0.5)	2.0 (0.6)	0.3 (0.4)	5.72	< 0.001	0.75
Group Participation	Experimental	2.0 (0.6)	3.3 (0.5)	1.3 (0.7)	14.12	< 0.001	1.85
	Control	1.9 (0.7)	2.2 (0.6)	0.3 (0.5)	4.58	0.032	0.60
Conflict Resolution	Experimental	1.6 (0.5)	2.7 (0.8)	1.1 (0.9)	9.34	< 0.001	1.22
	Control	1.5 (0.6)	1.8 (0.7)	0.3 (0.4)	5.74	0.054	0.43

4.4 Between-Group Comparisons

Table 3 presents independent samples t-test results comparing post-intervention competency scores between experimental and control groups, demonstrating significant differences across all measured dimensions.

Table 3

Post-intervention Between-Group Comparisons

Competency Dimension	Experimental M (SD)	Control M (SD)	t-value	df	p-value	Cohen's d	95% CI
Communication Competencies							
Verbal Expression	3.2 (0.5)	2.3 (0.6)	8.42	114	< 0.001	1.57	[0.69 , 1.11]
Active Listening	2.8 (0.6)	2.1 (0.5)	6.73	114	< 0.001	1.26	[0.49 , 0.89]
Non-verbal Communication	3.4 (0.6)	2.2 (0.7)	9.15	114	< 0.001	1.71	[0.94 , 1.46]
Collaboration Competencies							
Peer Interaction	3.1 (0.7)	2.0 (0.6)	8.89	114	< 0.001	1.66	[0.86 , 1.35]
Group Participation	3.3 (0.5)	2.2 (0.6)	7.94	114	< 0.001	1.48	[0.82 , 1.38]
Conflict Resolution	2.7 (0.8)	1.8 (0.7)	6.38	114	< 0.001	1.19	[0.61 , 1.17]

4.5 Analysis of Covariance Results

Table 4 presents ANCOVA results controlling for pre-test performance, confirming intervention effects while accounting for baseline variations in competency levels.

Table 4

ANCOVA Results with Pre-test Scores as Covariate

Competency Dimension	Adjusted Means	F-value	df	p-value	Partial η^2	Power
	Exp.	Control				
Communication Competencies						
Verbal Expression	3.18	2.32	67.24	1,113	< 0.001	0.37
Active Listening	2.79	2.11	45.31	1,113	< 0.001	0.29
Non-verbal Communication	3.38	2.22	83.47	1,113	< 0.001	0.43
Collaboration Competencies						
Peer Interaction	3.08	2.02	78.94	1,113	< 0.001	0.41
Group Participation	3.28	2.22	63.02	1,113	< 0.001	0.36
Conflict Resolution	2.68	1.82	40.68	1,113	< 0.001	0.28

Note. Adjusted means control for pre-test scores. Partial η^2 interpretation: 0.01 = small, 0.06 = medium, 0.14 = large.

4.6 Competency Development Patterns

Table 5 analyzes percentage of learners achieving proficient or advanced levels (Levels 3-4) in each competency dimension, demonstrating substantial experimental group advantages.

Table 5*Percentage of Learners Achieving Proficient/Advanced Levels Post-intervention*

Competency Dimension	Experimental Group	Control Group	Difference	χ^2 value	p-value
Communication Competencies					
Verbal Expression	84.5%	31.0%	53.5%	32.14	< 0.001
Active Listening	72.4%	27.6%	44.8%	20.85	< 0.001
Non-verbal Communication	89.7%	24.1%	65.6%	48.92	< 0.001
Collaboration Competencies					
Peer Interaction	79.3%	20.7%	58.6%	37.46	< 0.001
Group Participation	86.2%	27.6%	58.6%	38.71	< 0.001
Conflict Resolution	62.1%	13.8%	48.3%	26.84	< 0.001

4.7 Qualitative Competency Development Indicators

Analysis of teacher observations and student behavior documentation revealed systematic patterns of competency development among experimental group participants. Teachers consistently reported enhanced verbal confidence, with previously reluctant speakers volunteering for leadership roles and oral presentations. Active listening improvements were evidenced by increased question-asking behavior and sustained attention during verbal instruction periods. Non-verbal communication development manifested through spontaneous gesture use and improved spatial awareness during peer interactions.

Collaboration competency enhancements included more equitable participation in group activities, increased peer support behaviors, and development of conflict resolution strategies during collaborative tasks. Teachers noted that experimental group learners began demonstrating leadership rotation, inclusive participation practices, and autonomous problem-solving during group work situations.

5. DISCUSSION

The substantial improvements observed across all competency dimensions provide compelling evidence for TPR's effectiveness in developing integrated communication and collaboration skills. The large to very large effect sizes (Cohen's $d = 1.19-1.76$) substantially exceed those typically reported in educational intervention research, suggesting TPR may be particularly powerful for competency development in multilingual early childhood contexts.

The remarkable 70% improvement in non-verbal communication aligns with TPR's emphasis on coordinated physical and verbal expression, extending beyond vocabulary acquisition to demonstrate comprehensive multimodal communication development. The verbal expression improvements (52% increase) support Asher's theoretical framework emphasizing reduced language anxiety through kinesthetic approaches. The collaboration competency improvements (65-72% increases) represent novel extension of TPR research into social learning domains. The authentic collaborative requirements of TPR activities create natural contexts for developing complex social interaction skills that traditional instruction rarely addresses systematically. The superior effectiveness observed compared to previous research suggests cultural factors may enhance kinesthetic learning approaches in African educational contexts.

6. CONCLUSION

This study provides compelling evidence that TPR integration significantly enhances both communication and collaboration competencies among Grade 3 learners in multilingual educational contexts. The comprehensive improvements spanning all measured dimensions demonstrate TPR's effectiveness in developing integrated 21st-century skills essential for contemporary educational success. The rapid competency development achieved within four weeks demonstrates practical feasibility for implementation within existing educational systems. These findings support incorporating kinesthetic learning methodologies into teacher preparation programs and curriculum frameworks while highlighting the importance of culturally responsive pedagogical approaches. Future research should examine long-term retention of competency improvements and investigate TPR effectiveness across diverse cultural contexts to inform broader implementation strategies.

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