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Teacher Improvisation Skills in Enhancing Teaching and Learning Process in Pre-Primary Schools in Tanzania

Yusuph Maulid Kambuga

*PhD in Education, Department Business Administration, College of Business Education (CBE), Tanzania,
<https://orcid.org/0000-0001-5648-6968>*

***Correspondence email:** *kambuga2008@yahoo.com.*

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Abstract: The improvisational skills of teachers in enhancing the teaching and learning process in pre-primary schools in Tanzania were investigated in this study. The study was guided by three objectives, which addressed the availability of self-made teaching aids used in pre-primary classrooms, teachers' attitudes on improvising materials in pre-classes, and training needs for teachers to use improvisation in pre-primary schools. A mixed research approach using a cross-sectional design was implemented in the study. The study consisted of 10 pre-primary schools located in Dodoma City. A total of 30 teachers were selected to participate in the study through a combination of purposive and random sampling. The teachers were specifically chosen due to their considerable experience in pre-classes. Questionnaires (closed and open-ended) as well as observation checklists were used for data collection. Quantitative data were analysed using descriptive statistics with the help of the SPSS version 24, while the qualitative data were paraphrased as per content analysis principles. The study found that the use of improvised materials in pre-classes improved the creativity and innovation among pupils. Additionally, the study highlighted that teachers possessed special skills to prepare improvised learning materials, but they required more encouragement and training to utilise them properly. The study recommends emphasising the use of improvised instructional materials in pre-classes as they play a significant role in enhancing the productive learning. In addition, teacher improvisation skills should be frequently developed through the training in order to enhance teaching and learning.

Keywords: Improvisation, Skills, Teaching and Learning Process, Teachers, Pre-primary schools

Introduction

During the teaching process, teachers may not always have access to all the necessary teaching resources. In such cases, they have to seek alternative learning materials to accommodate their students' needs. These alternative materials may not be as perfect as the original resources, but they serve as substitutes (Adu & Adu, 2014; Ayua, 2011; Dhurumraj & Moola, 2023). Studies have revealed that in many developing countries, teaching and learning materials are scarce and expensive, and even when acquired, they are severely insufficient to accommodate the growing number of students in schools (Ayua, 2011; Obidike, 2021; Makokha, 2017). An effective teaching is not limited to the following of a predetermined curriculum or lesson plan but requires the ability to adapt and improvise based on the unique needs of individual students (Ayua, 2011; Mzinga & Onyango, 2021; Ngussa & Singolyo, 2018). This involves adapting to unexpected inquiries and modifying the teaching speed, and providing additional explanations or examples as needed. A skilled teacher can assess the class and customise their approach to accommodate diverse learning styles and abilities. Ultimately, the ability to improvise is a distinguishing feature of exceptional teaching. It allows educators creating dynamic, engaging, and impactful learning experiences for their students (Dhurumraj & Moola, 2023; Mzinga & Onyango, 2021; Ngussa & Singolyo, 2018; Ramaila, 2022). In the context of classroom teaching, teachers must be proficient in improvisation, and their experience only enhances their ability to respond to and navigate unpredictable educational scenarios that require immediate attention and action (Dhurumraj & Moola, 2023; Ramaila, 2022; Ramothwala & Ramaila, 2020).

Many African schools continue to face resource limitations, underscoring the imperative for teachers to innovate their teaching approaches and utilise improvised resources to enhance comprehension of complex scientific concepts (Ramothwala & Ramaila, 2020). Teachers are considered critical agents of educational change who can help improving the learning experience for students (Lukman, 2021; Ramaila, 2022). Teachers' improvisation skills are considered to be the act of using local resources or alternative materials in order to facilitate the teaching in the absence of first-hand teaching aids (Lukman, 2021). Studies show that the improvisation of learning materials grants learners a first-hand experience and reduces the burden of talking too much on the part of the teachers (Bertram, 2021; Dhurumraj & Moola, 2023; Lukman, 2021). The efficacy of pre-primary education hinges on the availability of resources, instructional materials, and teacher expertise (Dhurumraj & Moola, 2023; Ramaila, 2022). According to Ezechi (2019), an effective content delivery requires teacher, learner, and resource interaction. Regrettably, numerous preschools in rural areas of developing countries suffer from a lack of sufficient access to standardised commercial instructional materials. Consequently, this situation poses significant obstacles to effective teaching (Dhurumraj & Moola, 2023; Githui et al., 2021; Ramaila, 2022; Ramothwala & Ramaila, 2020).

According to Makokha (2017), children are naturally curious to learn about their surroundings and engage in learning processes that involve exploration, discovery, experimentation, organisation of information, and reporting. Obidike (2021) argued that teachers must be resourceful and creative in developing affordable and effective learning materials to enhance children's learning experience. However, due to a shortage of commercial and standardised instructional materials in many rural preschools, teachers are often compelled to use improvised materials as a substitute for essential equipment (Ramaila, 2022; Ramothwala & Ramaila, 2020). Research shows that a teacher's ability to improvise and to effectively use resources can significantly impact student performance (Ibrahim et al., 2020; Obidike, 2021). Instructional materials are essential tools that help teachers cater to the varying

learning needs of students in the classroom. By using a range of aids that appeal to different types of learners, teachers can supplement their verbal explanations and ensure that the lesson is comprehensible to all students (Lukman, 2021; Obidike, 2021).

Okori and Jerry (2017) noted that teachers should possess knowledge and expertise in utilizing low-cost materials to guarantee accuracy and precision in their classroom applications. On the other hand, Ramothwala and Ramaila (2020) and Stephen (2015) argued that teachers' lack of exposure to improvised resources may impede their ability to effectively teach using instructional materials, which could lead to the perpetuation of learner misconceptions, as improvisation is a skill that many teachers have yet to develop. Mabasa and Singh (2020) found that preschool teachers rely solely on textbooks, neglecting the use of improvised resources. This approach has a negative impact on the performance of preschoolers. According to Obidike (2021), practical teaching and permanent learning occur when students actively participate in various learning activities designed to challenge them to think creatively about their subject matter. Teachers should provide students with a wide range of learning materials. However, teachers should promote improvisation when these materials are unavailable or too expensive.

Instructional materials play a crucial role in Tanzanian preschools, as they are essential for effective pre-primary teaching. This highlights the significance of providing quality early education, as it greatly shapes a child's future success. Early exposure to educational materials helps foster various developmental domains (Ngussa & Chiza, 2017; Ngussa & Singolyo, 2018). Studies conducted in Tanzania revealed that many teachers are not enough equipped to create instructional materials on their own, resulting in a shortage of resources for early education. This shortage of materials has led to difficulties in improvising materials in the classroom, which can significantly increase costs (Mzinga & Onyango, 2021; Ngussa & Chiza, 2017). The aforementioned challenge arises from a combination of different factors, including limited financial resources, inadequate improvisation skills and strategies, and overcrowded classrooms resulting from the introduction of free and mandatory secondary education. Additionally, time constraints, rural school locations, a lack of experts, and difficulty identifying local materials can contribute to the issue (Makwinya, 2021; Mtitu, 2014; Mzinga & Onyango, 2021). According to Mtitu (2014), most school teachers do not utilise improvised materials or engage in improvisation. The study noted that many teachers need more motivation, creativity, and time to improvise instructional learning materials. Many preschools in Tanzania are affected by this issue, where studies indicate that instructional materials of all types are unavailable, and teachers are not prepared to improvise them to ensure effective teaching (Makwinya, 2021; Mtitu, 2014; Mzinga & Onyango, 2021; Ngussa & Singolyo, 2018). This research sought to investigate the improvisational skills of teachers in enhancing the teaching and learning process in pre-primary schools in Tanzania.

Research Problem

Teachers need to provide sufficient materials from the local environment for the pre-primary children since they learn best when being engaged in activities and manipulating materials. Unfortunately, many researches show that instructional materials are inadequate and minimally used in pre-primary classes. It has also been observed that there are consistently poor learning outcomes in the 3Rs for pre-classes. This highlights the need for pre-class teachers to embrace the improvisation of materials from the local environment to address the shortage, improve instruction, and enhance performance in pre-classes.

Research Focus

In many developing countries, including Tanzania, schools frequently encounter a scarcity of instructional materials, which compels teachers to explore alternative resources beyond the classroom.

This is crucial for pupils to participate in class actively. Improving teachers' improvisation skills can contribute to addressing the limitations of instructional materials and enhancing the teaching and learning experience in pre-primary schools.

Research Aim and Research Questions

The study sought to investigate the improvisational skills of teachers in enhancing the teaching and learning process in pre-primary schools in Tanzania. Objectively, the study addressed the availability of self-made teaching aids used in pre-primary classrooms, teachers' attitudes on improvising materials in pre-classes, and training needs for teachers to use improvisation in pre-primary schools.

Research Methodology

General Background

Quantitative and qualitative research methods were used in the study. Additionally, the study was supported by a cross-sectional mixed methods design approach. The design was chosen to allow the researchers to gather information about a specific population at a particular point in time while minimising the impact of researcher bias (Creswell, 2014; Plano Clark et al., 2015). This design was considered appropriate for achieving the research objectives and enabled the researchers to conduct a thorough analysis of the research problem.

Sample / Participants / Group

The study was conducted in Dodoma City, covering 10 public pre-primary schools randomly selected from a list of primary schools in the area. The study selected 30 teachers, three from each school, using a combination of purposive and simple random sampling techniques. The selection criteria were based on their extensive experience in teaching pre-classes. The sample size determination was adjusted using Krejci and Morgan's sampling tables formula for accuracy and reliability.

Figure 1

Krejci and Morgan's Table for Determination of Sample Size

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	346
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	354
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	191	1200	291	6000	361
45	40	170	118	400	196	1300	297	7000	364
50	44	180	123	420	201	1400	302	8000	367
55	48	190	127	440	205	1500	306	9000	368
60	52	200	132	460	210	1600	310	10000	370
65	56	210	136	480	214	1700	313	15000	375
70	59	220	140	500	217	1800	317	20000	377
75	63	230	144	550	226	1900	320	30000	379
80	66	240	148	600	234	2000	322	40000	380
85	70	250	152	650	242	2200	327	50000	381
90	73	260	155	700	248	2400	331	75000	382
95	76	270	159	750	254	2600	335	1000000	384

Note: N is Population Size; S is Sample Size

Source: Krejcie & Morgan, 1970

Source: Krejcie and Morgan (1970).

Instrument and Procedures

Two methods of data collection were employed in the research: questionnaires (both closed and open-ended) and observation checklists, in order to cross-check and validate the findings. The questionnaire was set to acquire information on teachers' attitudes on improvising materials in pre-classes, and training needs for teachers as detailed in table 1,2 and 3. To ensure the questionnaire's validity, a rigorous evaluation was accomplished by a research expert from the University of Dodoma prior administering them to data collection process. The expert provided valuable feedback for improving the questionnaire, which was duly incorporated. At the same time, the questionnaire's reliability was ensured by calculating Cronbach's Alpha for each variable using SPSS version 24. The resulting Cronbach's Alpha value was greater than 0.6 for each variable, indicating that all the questionnaire items were reliable. Likewise, an observation checklist was used to track the availability of improvised materials in pre-primary schools.

Data Analysis

Data analysis is the systematic process of organising, summarising, and interpreting data in order to gain meaningful insights and uncover patterns or trends that can inform decision-making and enhance understanding (Creswell, 2014, 2021). To analyse qualitative data obtained through observation, the data was systematically arranged into categories and themes as per the content analysis principles. Alongside quantitative data, this approach helped making sense of the data. To analyse the data collected through the questionnaire, descriptive statistics of mean (s) and Standard deviation were generated with the help of the Statistical Package for Social Sciences (SPSS version 24).

Ethical Considerations

To guarantee compliance with the ethical principles of research, the researchers implemented certain measures. Prior to the data collection, a permission was granted from relevant authorities. The

researcher also took the necessary steps to reassure the respondents about the confidentiality of the information they provided before administering the questionnaires.

Research Results

This study was carried out in actual school environments to investigate the improvisational skills of teachers in enhancing the teaching and learning process in pre-primary schools in Tanzania. Objectively, the study addressed the availability of self-made teaching aids used in pre-primary classrooms, teachers' attitudes on improvising materials in pre-classes, and training needs for teachers to use improvisation in pre-primary schools. The results of the study are presented based on these three research objectives.

The Availability of Self-made Teaching Aids used in Pre-primary Classrooms

The first objective of this study was to determine the availability of self-made teaching aids used in pre-primary classrooms. To verify the presence of these materials, a physical observation was conducted in all pre-schools visited, using a checklist. A list of such materials was then presented to the teachers, who were asked to indicate whether they had them. The responses were then recorded as "available" (✓) or "not available" (X) and summarised in Table 1.

Table 1

The Availability of Self-made Teaching Aids used in Pre-primary Classrooms

#	Improvised materials	Available	Not available
1	Models (plants, animals, body skeleton)	✓	
2	Drawing and pictures of different things	✓	
3	Charts of alphabet	✓	
4	Decorated bottles		X
5	Sinking and floating items (stones and feathers, etc.)		X
6	Sticks and wood	✓	
7	Flowers and leaves	✓	
8	Harmless insects		X
9	Playing toys (i.e., car, aeroplane)		X
10	Coloured corn cobs for counting	✓	
11	Coloured pebbles for counting	✓	
12	Cards for designing an alphabet	✓	
13	Painted walls	✓	

The results presented in Table 1 demonstrate the prevalence of improvised instructional materials used during pre-classroom visits in the sampled schools. The study found that all the schools had adopted improvised materials such as models of plants, animals and the human body, drawings and pictures of various objects, charts of the alphabet, flowers and leaves, sticks, and wood placed around all learning corners. The physical observation confirmed that these materials were readily available in all the schools. This finding indicates teachers have widely embraced improvised instructional materials to teach pre-class children. However, it was observed that certain materials like harmless insects, sink or float (i.e., stones and feathers), playing toys and decorated bottles were not available in the schools that were visited for the sample. They may have been absent because of the vastness of their surroundings, which could have posed challenges in establishing a presence. Additionally, the accessibility of resources

in their environment might have been a limiting factor in their ability to thrive and survive in that location.

Teachers' Attitudes Towards Using Improvised Materials in Pre-Class Teaching

The second objective of this study was to evaluate teachers' attitudes towards using improvised materials in pre-class teaching. A four-point rating scale was used to capture teachers' responses, ranging from Strongly Agree (SA) to Strongly Disagree (SD). The teachers' responses were then summarised in Table 2.

Table 2

Teachers' attitudes on improvised materials in pre-classes

Variables	N	Min	Max	Mean	Std. Deviation
I prepare improvised teaching materials	30	1	4	3.10	.759
Improvised materials are a waste of time in preparation	30	2	4	3.77	.504
Improvisation enhances pupils' understanding	30	3	4	3.90	.305
Improvised materials do not last longer	30	2	4	3.60	.563
Improvised materials are of low quality and standards	30	1	4	3.30	.702
Overall mean				3.53	.505

The data presented in Table 2 shows that the average score for teacher attitudes towards the use of improvised materials in pre-classes is 3.5, which is higher than the neutral score of 3.0. This indicates that teachers generally have a positive attitude towards the use of improvised materials in pre-classes. Additionally, the mean score for improvisation to enhance pupils' understanding was found to be higher than other means, suggesting that teachers recognise the value of improvisation in promoting students' comprehension. Moreover, most participants strongly agreed that preparing improvised teaching materials is time-consuming and tedious, as evidenced by the mean score of 3.7. This suggests that although teachers recognised the benefits of using improvised materials in pre-classes, they also acknowledged the challenges associated with their implementation. Overall, the findings suggest that teachers had a positive attitude towards the use of improvised materials in pre-classes, but they also recognised the need for more support and resources to facilitate their use in the classroom.

Training Needs for Teachers to Use Improvisation in Pre-Primary Schools

The study aimed to investigate whether teachers in pre-primary schools require training in order to effectively utilise improvisation techniques. A four-point rating scale was used to capture teachers' responses, ranging from Strongly Agree (SA) to Strongly Disagree (SD). Furthermore, the study calculated mean and standard deviation to determine the extent to which teachers required training to employ materials improvisation in the pre-class teaching and learning process. The teachers' responses were then summarised in Table 3.

Table 3*Training Needs for Teachers to Use Improvisation in Pre-Primary Schools*

Variables	N	Min	Max	Mean	Std. Deviation
Teachers require training to utilise locally available materials for adequate student comprehension	30	3	4	3.90	.305
Trained teachers can utilise improvised teaching materials to enhance the clarity of the learning process effectively	30	4	4	4.00	.000
Trained teachers have positive attitudes towards improvisation	30	3	4	3.77	.430
When teachers receive proper training, they can use hand tools to improvise	30	3	4	3.93	.254
Overall mean				3.9000	.21375

Based on the analysis of the results presented in table 3, it is evident that there is a strong need for teacher training in materials improvisation for the pre-class teaching and learning process. The recorded average score was 3.9, which is higher than the neutral score of 3.0. This highlights the fact that teachers require capacity enhancement to effectively improvise materials in pre-classes. It is evident from the mean score that a proper training is necessary for teachers to use local materials to explain various concepts to their students. Interestingly, all teachers who scored a mean of 4.00 agreed that trained teachers can utilise hand tools for improvisation, but they require sufficient training to use the available materials effectively. The research also indicated that all respondents unanimously agreed that teachers' training was critical in enabling them to use materials for an effective improvisation, which is vital in teaching pre-classes.

Discussion

Teacher classroom improvisational strategies are frequently viewed as a substitute for pre-made instructional materials. These strategies can take many creative forms, including storytelling, pantomime, music, poetry, and comedy. Studies show that there are four main reasons for using improvisation in the classroom, which align with the characteristics of the current generation of learners, also known as the "Net Generation" (Adu & Adu, 2014; Githui et al., 2021; Kira & Nchunga, 2015; Mzinga & Onyango, 2021; Okori and Jerry, 2017). These reasons include catering to learners' desire to use technology and learn through inductive discovery and experiential experiences; developing learners' multiple and emotional intelligence; fostering collaborative learning by building trust, respect, and team spirit, as well as improving listening, verbal and nonverbal communication, ad-libbing, role-playing, risk-taking, and storytelling skills; and promoting deep learning by actively engaging with new ideas, concepts, or problems, linking the activities or tasks to prior learning, applying the content to real-life situations, and evaluating the logic and evidence presented.

The study sought to determine the availability of self-made teaching aids used in pre-primary classrooms. The results indicated that models of plants, animals and the human body, drawings and pictures of various objects, charts of the alphabet, flowers and leaves, sticks, and wood were available at schools. However, materials like harmless insects, items that sink or float (i.e., stones and feathers), playing toys and decorated bottles were not available in the schools that were visited for the sample. This could be attributed to the expense of color materials or possibly a deficit in teachers' abilities to effectively improvise with such resources. This finding confirmed earlier researches conducted by

Makokha (2017), who discovered that tangible items such as illustrations and photographs of different things, alphabet charts, flowers, and leaves, among others, were widely accessible in pre-primary classes in Kenya. Furthermore, Asare et al. (2018), Kiambi and Waithaka (2023) observed that these materials were readily available because they are easily found in the local environment, inexpensive, and simple to maintain. Although the necessary teaching materials were present in all the schools visited, they were not enough to meet the needs of all the children. In addition, many teachers in pre-primary schools have reported that they faced challenges in improvising and utilising materials effectively for teaching and learning due to the lack of experience and time constraints, which were significant obstacles in the process. This observation is in line with Asare et al.'s (2018) findings that most teachers in Ghanaian schools did not use improvised materials during the teaching and learning process.

Additionally, the study aimed to evaluate teachers' perspectives on utilising improvised materials in pre-class teaching. The results revealed that the majority of teachers strongly agreed that the preparation of improvised teaching materials was a time-consuming and tedious task. Teachers generally believed that improvised materials had a short lifespan but could have a positive impact on the teaching and learning process. These findings align with Ayua (2011) and Asare et al.'s (2018) observations which suggest that while improvisation is a familiar concept to many teachers, its application is limited due to preparation skills, insufficient encouragement from school administrators and time constraints. Other studies have also supported these findings by indicating that experienced teachers tend to use improvisation in their classrooms, and those who have trained in improvisation during their studies are more likely to do so (Kasimova, 2023; Lukman, 2021; Ngussa & Singolyo, 2018). However, some studies have pointed out that improvisation can be difficult for teachers who lack the necessary skills (Amos et al., 2022; Githui et al., 2021; Kiambi & Waithaka, 2023; Mzinga & Onyango, 2021).

Another important finding of this study was that all teachers required capacity enhancement to effectively improvise materials in pre-classes. This finding supports the studies of Amos et al. (2022), who concluded that the lack of professional development can hinder efforts to improve student performance. Furthermore, this finding coincides with that of Zondi and Ramaila (2020) who emphasised the importance of a teacher's ability to improvise, as poor academic performance can be attributed to this factor. Therefore, with professional development, teachers can provide the necessary support that can help students achieve their academic goals.

Conclusion

Based on the study findings, teachers have a basic understanding of improvisation, but they lack the necessary professional training to acquire the practical skills required for an improvisation in the classroom. This can be attributed to the fact that teachers in pre-primary classes may lack the necessary qualifications for teaching, which consequently affects their motivation to innovate and adapt. It is also, important to note that the level of improvisation is directly proportional to the level of training, skill acquisition, and encouragement received by teachers, which in turn has a significant impact on their performance in the teaching and learning process. Therefore, it is crucial to develop and empower teachers with the necessary skills to support pupils effectively and to enhance their overall productivity in the classroom.

Recommendations

Based on the findings, the following recommendations are made for the implementation:

Recommendation for Governments: ministries of education should prioritise the enhancement of teacher training programs to emphasise the acquisition of practical skills, as these skills are becoming increasingly essential in contemporary education. Additionally, educational governing bodies should develop tailor-made courses for teachers working in pre-primary and primary schools to augment their proficiency in improvisation. Furthermore, ministries dealing with education ought to recognise, celebrate, and award teachers who demonstrate outstanding abilities in improvisation, encouraging creativity and motivation among their peers in educational institutions.

Recommendations for school and teachers: schools should prioritize the support and provision of tools, materials, and assistance to foster and empower creative teachers. This encouragement will serve as a catalyst for generating innovative ideas and solutions in the classroom, hence enhancing students' overall learning outcomes; Teachers should use limited resources to effectively teach and improve student achievement by improvising learning materials; Pre-class teachers should be encouraged to prepare learning materials creatively and make classes more practical since using real objects positively influences pupil's learning outcomes.

Further Research Studies

During the study, it was evaluated that improvised materials were available in almost all of the visited schools. However, the majority of these schools expressed a need for more training in their usage. The study focused solely on the use of improvised materials in pre-class instruction. More research studies should be conducted for other levels of primary and secondary school. Another study needs to be conducted on classroom observations to better understand the ways of teachers' use of the improvised materials in the classroom. The aim of this study would be to assess the effectiveness of improvised materials on learners' achievement. Furthermore, additional studies could be effectuated to explore other factors that may influence the use of improvised instructional materials in primary school instruction.

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