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Availability and Use of Learning Resources for Basic School Mathematics Instruction in Ghana

Edward Abatanie Padmore[1], Ibrahim Mohammed Gunu[2], Clement Ayarebilla Ali[3]
[1]Nusrat Jahan Ahmadiyya (NJA) College of Education, Wa, Ghana
[2]University for Development Studies, Tamale, Ghana
[3]University of Education, Winneba, Ghana

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ABSTRACT

The study investigated the availability and use of mathematics learning resources at the basic school levels. Ascertaining the availability, use, and mathematics learning resources were the epicenters of this study. The methodology employed was the descriptive survey research design. Through the census technique, 102 junior high school mathematics facilitators participated in the study. The data collection instrument was the questionnaire. Experts and two lecturers validated the instruments using appropriate design, sampling techniques, and data collection tools. The repetitions of the same participants for four different research questions also yielded a 0.80 reliability coefficient. The researchers used frequency and percentage to analyze the data. The results showed that attribute blocks, base ten blocks, and geoboards were the worst unavailable resources. Also, even though facilitators were involved in improvising a few resources, most were not improvised. Lastly, the major challenges were curriculum content, textbooks, and school funds, making many mathematics learning resources nonimprovisable. It was therefore recommended that practical courses in mathematics learning resources construction and usage be incorporated into teacher training and regular professional training and retraining programs.

Corresponding Author:

Clement Ayarebilla Ali
School of Education and Lifelong Learning, University of Education, Winneba, Ghana
Email: aliclement83@gmail.com

1. INTRODUCTION

The mathematics curriculum strongly emphasizes using learning resources to support these areas. Although many basic schools lack these educational materials, and those that do have them are not always in sufficient amounts, learning and facilitation must continue. Learning resources are used to facilitate and learn effectively [1]. Since learners will actively participate in the lesson, innovative resource-based facilitating strategies improve the performance of both facilitators and learners in the classroom. Though the Ghanaian curriculum indicates that they are helpful in the comprehension of mathematical topics whenever they are used in the school, the lack of available learning resources pushes facilitators to adapt to facilitate [2]. Improvisation significantly reduces the cost of buying things, which is vital and required at a given time. They facilitate learners in the working principles of the improvised resources they generate or help facilitators create [3].

Also, [5] found the prevalence of inadequate use of instructional materials in most schools, and most teachers did not take cognizance of the importance derived from the use of instructional materials while teaching [3]. Moreover, Umuhoza and Uworwabayeho [4] were concerned about the practical utility and the appropriate utilization of the resources and did not use them appropriately. In this study, the quest for facilitator-made resources was spurred by the scarcity of resources and their high cost. Therefore, if some learning resources are improvised from locally available content, securing enough learning resources for the growing number of learners will be easier. The researchers recommend that facilitators employ the inadequate learning resources required to assist the subject [5]. The primary objective of developing instructional resources is to suitably assist the learning process if skills are to be acquired [6]. Studies in Ghana showed that it would be challenging for facilitators and schools to get the money needed to purchase these learning resources to effectively deliver mathematics lessons, given their high costs [1], [2]. Along with the low pay for facilitators, there is also a need for resources to support facilitating mathematics. To improve students' interest in and understanding of the subject while alleviating part of the financial burden on the nation, schools, and facilitators, they should produce these resources locally [4].

Again, according to the National Council for Curriculum and Assessment [1], the need for learning resources in the classroom stems from the high demand for education and changes in Ghanaian society and the rapidly evolving global landscape. These factors require that learners be trained to be self-sufficient, which will help them develop the core competencies of critical thinking and problem-solving, creativity and innovation, communication and collaboration, cultural identity and global citizenship, personal development and leadership, and digital literacy [7]. With the facilitator's guidance, using learning resources in the classroom with learners will develop all those skills. It is important to help facilitators realize that learning resources are used to make their jobs easier and to facilitate more effectively. Despite the advantages of using learning resources in the classroom, some facilitators believe they are only for practicing learners or should be used as decoration [8].

Furthermore, the challenges of effectively utilizing learning resources are that most facilitators in our basic schools are trained in the subject matter but are accustomed to teaching in our basic schools within the current educational system. Many facilitators lack the skills to use and recognize the potential of many low-cost, simple learning resources because they have not received enough training [9]. The mathematics facilitator should know how to create alternative learning materials to help their learners visualize whatever subject they wish to teach [9].

In addition, inexpensive and readily available resources should be prioritized if learning resources are to be improvised [3]. Before they can improvise, a math facilitator needs to be familiar with the different kinds of learning resources, their features, and their benefits. The use of improvised learning resources has several advantages, such as encouraging learners to engage in critical and creative thinking while creating the necessary instruments, helping them understand concepts taught through improvised resources, encouraging the systematic integration of various resources in facilitating learning experiences, and helping them actively participate in improvisation [3]. When learners actively participate in improvisation, they learn the working principles and gain the knowledge and problem-solving abilities necessary to solve daily scientific and technological problems [7].

1.1 Theories on Instructional Resources

Instructional theories describe how to help learners learn and develop, create conditions that boost the chance of learning, and improve instruction. The three kinds of instructional theories are behaviorist, cognitivist, and constructivist. Behaviorist theories state how behaviors change in response to various stimuli. The behaviorists proposed that environmental stimuli and consequences shape behavior and that learning occurs through operant conditioning. Operant conditioning involves reinforcing or punishing behaviors based on their outcomes. For example, if a student gets praised for answering a question correctly, they are more likely to repeat that behavior in the future. On the other hand, if a student gets scolded for talking out of turn, they are less likely to repeat that behavior in the future [10].

The cognitive theories focus on a psychological approach to learning that may rely on rehearsal or mnemonics. These theories proposed that the nuanced processes underpinning learning must be understood and prioritized. This means thinking about how the mind receives, organizes, stores, and retrieves information. Therefore, in cognitivism, the spotlight is not just on the learner's actions but also on understanding what they know and the mechanisms through which their knowledge is acquired [11].

The constructivist theories depend on students shaping their learning experience while drawing upon previous knowledge. These theories say learners construct knowledge rather than passively take in information. As learners experience the world and reflect upon those experiences, they build their representations and incorporate new information into their pre-existing knowledge called schemas [10].

The discussion of the three kinds of theories shows that the resources facilitators employ are related to the learning outcomes of their learners. Educators can help learners develop the highest-order academic skills by teaching them to follow rules and principles and explain concepts in an easy-to-understand, step-by-step manner [10]. Self-facilitating or directed learning, learning resources, and facilitation are expected to help learners develop higher-order learning skills. This indicates that eliciting results, providing input on performance correctness, and providing learning guidance are the main components of the resources for guided discovery learning. For Ghanaian mathematics facilitators, several of Gagne's ideas have broad ramifications [11]. Many of these ideas highlight how learners can strengthen their critical thinking and problem-solving abilities. On the other hand, the idea does not address whether learners should think critically about what they are learning or how they might independently solve problems. Nonetheless, it is thought that the purpose of learning resources is to stimulate learners' creativity and problem-solving skills while stretching their imaginations [7].

1.2 Sociocultural Theory of Teaching, Learning, and Development

Similarly, Lev Vygotsky thought that learning resources may help learners develop higher-order thinking skills, which are crucial for problem-solving exercises [12]. The sociocultural theory of teaching, learning, and growth served as the second theoretical framework for this study. This idea, which is mainly based on Lev Vygotsky's groundbreaking writings, contends that no preconceived cognitive frameworks that develop with maturation cause human brains to change [12]. In contrast, this view holds that human minds change due to ongoing interactions with the social material world.

Vygotsky asserts that individuals use their interactions and mutual learning to interpret the resources at their disposal [12]. Examples of these resources include a diagram, a model, or a pattern for resolving a problem in the classroom [13]. Learning from these resources serves purposes beyond the development of the mind [11]. They represent the meanings and functions of items as they are discovered via cultural practices. In human cultures, they are objects that can be used for specific purposes. In this study, therefore, the only way a learner may appropriate the resources is to act intentionally and with them to rebuild their sense and objective [13].

The significance of integrating sociocultural resources cannot be over-emphasized. According to Umuhoza and Uworwabayeho [4], they help accomplish cultural instrument restoration procedures by collaborating and interacting with people familiar with a specific cultural tool. They help to demonstrate that, although instructional resources aid in integrating learning, instruction, and cognitive growth, they promote convergence without additional assistance. Ultimately, the learning resources foster cognitive development by mediating learners' reasoning, which is the foundation of mental development [4].

1.3 Perception of Use of Mathematics Learning Resources

Mathematics learning resources help in facilitating the learning process [14]. Examples include charts, rubber bands, abacus, bug counter attributes blocks, addition machines, Cuisenaire rods, color tiles garboard the internet, and electronic and audio-visual learning resources such as computers, laptops, and classroom improvised resources [15]. These resources are crucial for making learning easy and helping the learner understand the mathematical concepts during class discussions or self-learning [1].

In learning activities, such as active learning and measurement, facilitators use resources to apply instructions and provide learners with learning objectives. They make learning more dynamic, engaging, and fascinating by helping to concretize a learning experience [16]. Though Saad and Sankaran [16] discovered that the materials should give them the knowledge, abilities, and skills they need to advance, the researchers believed that learners should be given the resources to solve problems and think critically.

1.4 Availability of Use of Mathematics Learning Resources

Obara and Were [17] found a lack of educational resources in some African nations, and so many African nations lack the resources necessary to meet the demand for education. This means that learning resources rarely support the self-discovery of both facilitators and learners. Even though they enhance learner-centered facilitating and learning strategies [18], the school's fundamental goals, like facilitating to attain exceptional results, might be seriously impeded without sufficient facilitating and learning resources, regardless of how well-staffed the institution is. However, since learning resources engage, attract, and maintain learners' attention, the researchers opine that they promote development [17].

1.5 Statuses of Mathematics Learning Resources

Despite the many benefits and advantages of using learning resources in the mathematics classroom, some issues come with it. Bukoye [6] suggests that instructional resources are useless because they come with many challenging tasks that require much work to explain in class. This means these learning resources unaffected many weak learners in mixed-ability classes. For them, classic and authentic resources are interchangeable. They get irritated and demotivated because learning resources may keep learners from responding meaningfully but also cause them to feel confused, frustrated, and demotivated [4]. The gap is even worse when choosing the appropriate learning resources, as it takes much time.

Also, producing high-quality resources takes time, and sufficient staff time and resources must be allotted. Resources created by facilitators typically do not meet the same quality and design standards as commercial materials, which means they could not look as good, and sufficient training is required to prepare facilitators for resource writing assignments. Writing effective resources is a specialist ability; not all facilitators possess it. Inadequate understanding of pedagogy, technology, and learning, especially the availability of learning resources and the time commitment [19].

Furthermore, the belief held by facilitators is that learning is only appropriate for children who are struggling. Over time, that keeps happening. Learners ought to be allowed to get up and utilize the learnings of their choice. Any learner, regardless of whether they are mathematically talented, should always have easy access to learning resources [20]. The technique by which facilitators employ learning resources presents difficulties. The overlapping usage of one kind of manipulation causes complications when clarity begins to haze. For instance, because the base-10 blocks are used for both whole and decimal integers, they may lead to confusion. Depending on what the whole is, the decimal representation changes when it is used as a decimal, allowing learners to remain in their whole number zone instead of the decimal one. For instance, the rod becomes our hundredths, the flat becomes the tenth, the whole becomes the enormous cube, and it is disconnected in the nearest hundredth.

Again, learning is hampered if the facilitator employs excessive learning to the point where learners do not comprehend it [20]. Some facilitators thought learning resources were helpful, but when asked to describe what made the learning valuable for understanding mathematics, they could not do so. The facilitators would successfully convey the meaning to their learners if they knew the concept underlying learning materials. Additionally, when selecting learning resources for mathematics lessons, mathematics facilitators must exercise caution and not mislead learners into misinterpreting some mathematical symbols. Another issue arises when a student observes an object being used to facilitate one concept and is instructed to utilize it in another [21].

Lastly, learning resources may be misused in mathematics instruction due to the absence of professional development. Ongoing professional development is essential to demonstrate to facilitators how to facilitate ideas and skills effectively and raise student accomplishment. Cooperation is essential to facilitators' educational practice [21].

In conclusion, new teaching techniques are challenging and demanding, and facilitators should be prepared to invest the time and materials necessary to learn and apply them. The yawning literature gaps dwelt and over-emphasized regular participation in professional development, collaboration co-construction, localization, and improvisation. All these activities might be a mirage if mathematics facilitators cannot make their instructional resources [21].

1.6 Purpose of the Study

The study investigated the availability and use of mathematics learning resources to facilitate mathematics in basic schools.

1.7 Research Questions

1. What mathematics learning resources are readily available in basic schools?
2. How does the availability help in the incidence of use of the learning resources?
3. What do facilitators encounter when using the learning resources?

2. METHOD

2.1 Design of the Study

The research design was a descriptive survey. The descriptive design accurately and systematically described the population and phenomenon of availability and use of learning resources [22]. Without inferring cause-and-effect relationships, the design only provided a comprehensive and accurate picture of the phenomenon to inform future reoccurrences and avert its negative consequences on teaching and learning [23].

2.2 Population and Total Population Sample

The population consisted of 102 mathematics facilitators who worked in 56 different public basic schools in the study area. However, because of the limited number of mathematics facilitators in the basic schools, the whole population was used as a sample to conduct the study. This, also known as total population sampling, is a purposive sampling technique that examines the entire population (i.e., the total population) with a particular set of characteristics [24]. Even though the facilitators had different characteristics in terms of specific attributes/traits (e.g., age, gender, and religious beliefs) and attitudes (e.g., attitudes towards using learning resources), they shared particular experiences (i.e., they all have the same knowledge, skills, and competencies from their teacher preparation and training programs) [25]. The assumptions were that the small sample size of the population was characteristic of interest, and the characteristics shared by the population were uncommon [26].

2.3 Instrument

The standardized Improvisation of Mathematics Learning Resources Questionnaire was used to collect the data. The instrument was adopted from portions of Wang [27] and Collins [28] to suit this research. The instrument was made up of four sections. Section one details the biographical information of the respondents to give a snapshot of the mathematics facilitators. Section two entails the different learning resources in the local Indigenous environment. Section three comprises the learning resources in basic schools, and Section four enumerates the statuses facilitators encounter in handling these learning resources in the mathematics classroom [27].

The items were mainly closed-ended to restrict the respondents to essential elements of this study. This was akin to collecting quantitative data as it allowed the researchers to collect quick data, make consistent data collection analyses, and increase the accuracy of responses. The researchers opted for the four-point (i.e., for statuses) and five-point Likert (i.e., for availability of resources and incidences of use) scales to provide quick and easy measurements and interpretation. Because the five-point Likert scale gave neutrality, lower margins of error, and validity of results, the researchers added the four-point Likert scale for the statuses facilitators encounter [28].

2.4 Validity and Reliability

Three lecturers from the university specializing in mathematics education verified the instrument the researcher created for data collection. They took into account both the construct and face validity of the instrument. Using Cronbach's alpha analysis, the instrument's reliability was assessed and found to be 0.81 [29]. Two research assistants who had received one week of training assisted in administering the instruments to the 102 mathematics facilitators at the 56 basic schools. The researchers and their assistants administered the questionnaires to the respondents. The finished copies were immediately gathered, which resulted in a 100% return rate for the documents, which were then used for data analysis [29].

2.5 Data Analysis

The data gathered and coded were uniformly entered using SPSS. A five-point Likert scale concerning frequencies and percentages was used to answer the research questions about the level of available learning resources for mathematics and the extent to which the mathematics facilitators in basic schools use learning resources in mathematics instruction [15]. Additionally, a four-point Likert scale regarding frequencies and percentages was used to answer research question three, which asked what difficulties the mathematics facilitators faced when improvising learning resources. The researchers used quantitative data analysis techniques to examine the availability and utilization of learning resources in the mathematics classroom at the basic schools [30].

2.6 Ethical Consideration

This study's ethical considerations included voluntary participation, informed consent, anonymity, confidentiality, potential for harm, and results communication. Voluntary participation allowed participants to withdraw from or leave the study at any point without feeling obligated to continue. The participants did not need to provide a reason for leaving the study [29]. Informed consent compelled the researchers to disclose the study’s benefits, risks, funding, and institutional approval [26]. Anonymity did not allow the researchers to collect personally identifying information in names, phone numbers, email addresses, IP addresses, physical characteristics, photos, and videos. Only data pseudonymization is an alternative method where the researchers replace identifying information about participants with pseudonymous or fake identifiers. The data could still be linked to the participants, but it was more challenging because we separated personal information from the study data [23]. Confidentiality gave all participants the right to privacy to protect the data for as long as they stored or used it. The potential for harm was to avoid reporting sensitive data, which could lead to legal risks or a breach of privacy [22]. The results arose from honest, reliable, credible, and transparent [28].

3. RESULTS AND DISCUSSION

3.1 Research Question 1: What mathematics learning resources are available in the basic schools?

This research question was analyzed using a five-point Likert scale. The scales were Highly Available (HU), Available (A), Uncertain (U), Unavailable (UA), and Highly Unavailable (HUA). Table 1 shows the results.

According to Table 1, 80 (78.9%) of the respondents said that their schools did not have abacuses or place value charts, whereas only 10 (9.8%) said that the resources were available, and 12 (11.8%) were unsure. Just 9 (8.8%) of the respondents were unsure whether bug counters were available, but the majority, 93 (91.1%), answered that they were not. Furthermore, just 10 (9.8%) of the respondents were unsure whether characteristic blocks and color tiles were available, but the majority, 92 (90.2%), indicated that they were not. Just 8 (7.8%) of the respondents were unsure whether additional machine tape was available, although the majority, 94 (92.2%), answered that it was not.

There were 95 (93.1%) respondents who said that Cuisenaire rods were not available, compared to only 2 (2.0%) who were unsure and only 6 (5.9%) who said that Cuisenaire rods were available. Once more, 87 respondents (85.3%) answered that garboard was not available, whilst only 11 respondents (10.8%) were unsure, and just four respondents (3.9%) claimed that garboard was available. Once more, 94 (92.2%) respondents said that rubber bands were not available in their schools, 7 (6.9%) said they were unsure, and only 1 (0.98%) said that the supplies were available in the schools. Additionally, 91 (90.22%) respondents said no angles were available at their school, and just 11 (10.8%) were unsure.

Table 1. Availability of mathematics learning resources

Resources	HA	A	Uncertain	UA	HUA	Total
Abacus	0(0%)	10(9.8%)	12(11.8%)	43(42.6%)	37(36.3%)	102(100%)
Place value Charts	0(0%)	10(9.8%)	12(11.8%)	43(42.6%)	37(36.3%)	102(100%)
Bug Counters	0(0%)	0(0%)	9(8.8%)	34(33.3%)	59(57.8%)	102(100%)
Attributes Blocks	0(0%)	0(0%)	10(9.8%)	12(11.8%)	80(78.4%)	102(100%)
Addition Machine	0(0%)	0(0%)	8(7.8%)	15(14.7%)	79(77.5%)	102(100%)
Cuisenaire rods	0(0%)	6(5.9%)	2(2.0)	19(18.6%)	75(73.5%)	102(100%)
Color Tiles	0(0%)	0(0%)	10(9.8%)	12(11.8%)	80(78.4%)	102(100%)
Garboard	0(0%)	4(3.9%)	11(10.8%)	23(22.5%)	64(64.7%)	102(100%)
Rubber Band	0(0%)	1(0.98%)	7(6.9%)	43(42.2%)	51(50%)	102(100%)
AngLegs	0(0%)	0(0%)	11(10.8%)	45(44.12%)	47(46.09%)	102(100%)
Centimeter Cubes	0(0%)	0(0%)	8(7.84%)	41(40.20%)	53(51.96%)	102(100%)
Base Ten Blocks	0(0%)	0(0%)	2(1.98%)	45(45.12%)	55(54.46%)	102(100%)
Bucket Balance	0(0%)	2(1.98%)	7(6.9%)	42(41.58%)	51(50%)	102(100%)
Geoboard	0(0%)	1(0.98%)	2(1.98%)	39(38.2%)	60(58.8%)	102(100%)
Attributes Blocks	0(0%)	0(0%)	9(8.82%)	41(40.20%)	52(50.98%)	102(100%)
ICT Resources	0(0%)	12(11.8%)	0(0%)	32(31.4%)	58(56.9%)	102(100%)

Eight (7.84%) respondents said they were unsure whether centimeter cubes were available at their schools, while the majority, 94 (92.16%), said they were not. Additionally, just two people (1.98%) were unsure whether base ten blocks were available in their schools, whereas the majority of 100 people (98.02%) indicated that they were not. The majority, 93 (91.58%), said that bucket balances were not available in their schools, compared to 7 (6.9%) who were unsure and only 2 (1.98%) who confirmed this.

Once more, 99 (97%) of the respondents said that geoboard was not available in their schools, 2 (1.98%) were unsure, and only 1 (0.98%) said that geoboard was available in their schools. The majority, 93 (90.98%), verified the unavailability of characteristic blocks in their schools, while 9 (8.82%) were uncertain about the presence of attribute blocks in their schools. Lastly, regarding ICT resources, most 90 people (88.3%) indicated that the resources were unavailable in their schools, while just 12 people (11.8%) confirmed they were available.

3.2 Research Question 2: What is the incidence of using mathematics learning resources?

This research question was also analyzed using a five-point Likert Scale. The scales were Never (1), Rarely (2), Sometimes (3), Often (4), and Always (5). The results are displayed in Table 2 below.

The results on Table 2 shows many facilitators frequently Never use 98(96.1%) (Abacus), 87(85.3%) (Place value Charts), 100(98.0%) (Bug Counters), 101(0%) (Attributes Blocks), 102(100%) (Addition Machine Tape), 99(97.06%) (Cuisenaire rods), 99(97.06%) (Color Tiles), 67(65.69%) (Geoboard), 89(87.25%) (AngLegs), 98(98.08%) (Centimeter Cubes), 98(98.08%) Base Ten Blocks, 102(100%) (Bucket Balance), 102(100%) (Garage band), 97(95.10%) (Attributes Blocks) are the learning resources mathematics facilitators indicated they have never improvised for their lessons.

Table 2. Incidence of Use of Mathematics Learning Resources

Resources	**Never**	**Rarely**	**Sometimes**	**Often**	**Always**	**Total**
Abacus	98(96.1%)	4(3.9%)	0(0%)	0(0%)	0(0%)	102(100%)
Place value Charts	87(85.3%)	9(8.8%)	6(5.9%)	0(0%)	0(0%)	102(100%)
Bug Counters	100(98.0%)	2(2%)	0(0%)	0(0%)	0(0%)	102(100%)
Attributes Blocks	101(0%)	1(0%)	0(0%)	0(0%)	0(0%)	102(100%)
Addition Machine	102(100%)	0(0%)	0(0%)	0(0%)	0(0%)	102(100%)
Cuisenaire rods	99(97.06%)	3(2.94%)	0(0%)	0(0%)	0(0%)	102(100%)
Color Tiles	99(97.06%)	3(2.94%)	0(0%)	0(0%)	0(0%)	102(100%)
Geoboard	67(65.69%)	32(31.37%)	3(2.94%)	0(0%)	0(0%)	102(100%)
Rubber Band	20(19.61%)	21(20.59%)	56(54.9%)	5(4.90%)	0(0%)	102(100%)
AngLegs	89(87.25%)	11(11.78%)	2(1.96%)	0(0%)	0(0%)	102(100%)
Centimeter Cubes	98(98.08%)	4(1.92%)	0(0%)	0(0%)	0(0%)	102(100%)
Base Ten Blocks	98(98.08%)	4(1.92%)	0(0%)	0(0%)	0(0%)	102(100%)
Bucket Balance	102(100%)	0(0%)	0(0%)	0(0%)	0(0%)	102(100%)
Garageband	102(100%)	0(0%)	0(0%)	0(0%)	0(0%)	102(100%)
Attributes Blocks	97(95.10%)	4(3.92%)	1(0.98%)	0(0%)	0(0%)	102(100%)
ICT Resources	17(16.67%)	29(28.43%)	50(49.02%)	6(5.88%)	0(0%)	102(100%)
Counters	7(5.88%)	25(24.5%)	54(52.94%)	13(12.6%	3(2.9%)	102(100%)

While the majority of the respondents agreed that ICT resources (49.02%), counters (52.94%), and rubber bands (54.90%) are sometimes used for learning, a few of the respondents indicated that resources like ICT resources (28.43%), counters (24.5%), and rubber bands (20.59%) are rarely improvised. This shows that the facilitators are NOT involved to a reasonable extent in improvising a few resources, and the majority of resources could not improvised by them.

3.3 Research Question 3: What do facilitators encounter when using mathematics learning resources?

This research question is displayed in Table 3 below. The scales were Strongly Agree (SA), Agree (A), Disagree (DA), and Strongly Disagree (SD). The raw scores were used to analyze the data.

The results in Table 3 show that the majority (64) disagreed that mathematics facilitators possess the necessary skills for improvising learning resources, while 38 agreed that mathematics facilitators possess the necessary skills for improvising learning resources. Again, the majority (93) disagreed that the curriculum contains concepts that guide the facilitators on how to improvise resources, and only (9) agreed that the curriculum contains concepts that guide the facilitators on how to improvise learning resources.

Table 3. Status of Use of Mathematics Learning Resources

Statuses	SA	A	DA	SD	Total	Decision
Mathematics facilitators possess the necessary skills for the improvisation of learning resources	17	21	46	18	102	Disagree
The curriculum contains concepts that guide the facilitators on how to improve resources	0	9	58	35	102	Disagree
Many books are rich with techniques for the improvisation of learning resources.	0	9	58	35	102	Disagree
Facilitators seek the help of experts during the improvisation of some learning resources	45	34	19	4	102	Agree
The school helps the mathematics facilitators by providing funds to help in the improvisation of learning resources	0	0	43	79	102	Disagree
Learners are sometimes allowed to participate in the process of improvisation of resources	41	38	28	15	102	Agree
The schools have an extraordinary period for the facilitators to improvise learning resources.	0	0	48	54	102	Disagree

The majority (93) disagreed that many mathematics books are rich with the techniques for improvisation of learning resources, and just nine agreed with the statement. The majority (78) agreed that facilitators seek the help of experts during the improvisation of some learning resources, while only a few (32) disagreed with the statement. Also, all (102) disagreed that the school helps the mathematics facilitators by providing funds to help improvise learning resources. However, the majority (79) of the respondents agreed that learners are sometimes allowed to participate in the process of improvisation of resources, and only (33) disagreed with the statement. Finally, all (102) disagreed that the schools have an extraordinary period for the facilitators to improvise learning resources. The result from the table shows that these responses are the barriers facilitators faced in their efforts to improvise learning resources.

The findings mean that the majority of schools do not assist their facilitators in improvising non-available learning resources; some facilitators lack the skills required to do so; many schools lack learning resources; there is insufficient funding to buy the raw resources required for improvisation of learning resources; and many facilitators do not involve both learners and experts during improvisation.

3.4 Discussion

The findings show that most mathematics facilitators did not use learning resources due to the lack of these resources in the various schools. The results of Table 1 indicated that most of the learning resources were not available in the schools for effective facilitating and learning. This finding is consistent with previous research by Ihechukwu [3], who revealed that most facilitators merely reiterate outdated teaching methods. Instead of involving the learners in tasks that would help them develop the mathematics learning resources required for teaching and learning, they would instead employ the lecture approach due to a lack of mathematics learning resources [8], [27]. Therefore, all government and corporate entities' efforts to transfer technology will undoubtedly be in vain if the facilitating resources are not used appropriately [21].

The findings in Table 2 show that the facilitators failed to put any discernible effort into using learning resources unavailable in their various schools. The facilitators' incapacity to improvise non-available learning resources could be due to a lack of raw resources in the classroom or inadequate improvisational training from their preparatory institutions [17]. The educational environment, including the local community, should be utilized by a skilled facilitator to find resources and professionals that can assist with improvising this learning resource [18]. Only when facilitators can improvise these learning resources can facilitating and learning mathematics be effective and loving, as recommended by the National Council for Curriculum and Assessment [1].

The results in Table 3 revealed that mathematic facilitators face many challenges in improvising the availability of learning resources. The finding of Table 3 indicated that almost all the facilitators agreed they do not improvise learning resources any time they are to facilitate the subject. In all the items apart from items 4 and 5, the facilitators agreed to seek local Indigenous expert support and also engage learners anytime they intend to improvise learning resources. The facilitators have problems with the improvisation of these learning resources [13]. In the improvisation of learning indigenous resources, funding is important, but it should not be a major hindrance if the facilitators know what it takes to be called good facilitators [23]. They should always use their experience to source resources locally using any available material as an alternative to non-available ones. The facilitators should learn to use cheap and locally available resources to improvise learning resources [5].

4. CONCLUSION

There is a yawning literature gap between regular participation in professional development, collaboration co-construction, localization, and improvisation to the detriment of use, availability, and status of learning resources. First, the findings showed that most mathematics learning resources were unavailable in the basic schools. The basic schools were missing attribute blocks, base ten blocks, and geoboards.

Second, the findings showed that there was little provision of mathematics learning resources in the basic schools. This suggests that many facilitators are not effectively and efficiently engaging learners.

Third, the significant curriculum status content, textbooks, and school funds for learning resources increased. So, many of the mathematics learning resources cannot be improvised.

Recommendations

Therefore, the following recommendations are proposed. Courses on developing and utilizing practical mathematics learning resources should be integrated into the NaCCA curriculum at all levels. Additionally, at every stage of education, facilitators should be introduced to the practical applications of these resources. This approach will enhance students' understanding of mathematical concepts and facilitate the teaching process.

Key stakeholders are encouraged to conduct regular professional training and retraining programs on the development of learning resources. These programs will help and motivate mathematics facilitators to develop learning materials independently. Furthermore, professional learning community sessions could be expanded to include training on improvising and effectively utilizing learning resources.

Mathematics facilitators should also leverage the expertise of local professionals to develop community-based learning resources. Support from donor organizations such as the World Bank, UNESCO, UNICEF, and Education for All (EFA) can be sought if necessary.

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