HARNESSING LOCAL TECHNOLOGIES TO REVOLUTIONISE PRIMARY MATHEMATICS

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Abstract
This study explores integrating local technologies into primary school mathematics teaching, particularly in communities with limited access to modern gadgets. While modern technology can enhance learning, many pupils in rural areas are excluded from these benefits. The paper argues that familiar, locally available tools provide a practical, culturally relevant alternative. By contextualizing Mathematics instruction with everyday objects such as fruits, baskets, or traditional measuring instruments, educators can make learning more engaging, inclusive, and student-centered. This approach fosters motivation, deepens understanding of mathematical concepts, and connects abstract ideas to real-life experiences. Using local technologies also helps teachers move beyond traditional rote methods, improving performance and encouraging critical thinking. The study recommends that educators, policymakers, and curriculum developers promote local resources to ensure Mathematics remains accessible, meaningful, and relevant for all primary school pupils.

Keywords: *Local Technologies, Primary Mathematics, Mathematics Education.*

Introduction
Mathematics plays a vital role in achieving society's highly desired technological development, and its relevance to an individual's daily dealings is such that acquiring mathematical skills, ideas, processes, and computational skills is an indispensable tool for a meaningful human existence (Anyikwa&Okwumuo, 2025). Mathematics is regarded as a fundamental subject because it prepares individuals with the basic mathematical knowledge, skills, values, and attitudes necessary to function properly in society (Oyeniran, 2025).

As a result of its practicality, Mathematics is regarded as a useful subject. As arithmetic and logical reasoning form the foundation of science and

technology, it is regarded as a fundamental subject in science. It is a vibrant area of knowledge that contributes much to science, technology, the arts, and daily life (Harris & Bourne, 2017; Abramovich, Grinshpan, &Millagan, 2019; Ohuoha-Chidiebere&Ezenwa, 2020; Akinsola, 2023). Many students see mathematics as a difficult school subject; the methods teachers use to teach mathematics affect pupils' level of understanding (Murphy, 2016).The use of technology in teaching and learning is growing rapidly worldwide, across all fields and levels. Some local areas in developing nations have not adopted these technologies due to a lack of resources. As the world is changing and development waits for no one, primary school Mathematics teachers in developing nations must introduce relevant local technologies into pupils' environments to make Mathematics teaching relevant, interesting, and up to date.

Technology is the application of scientific knowledge for practical purposes to solve problems, satisfy perceived needs and aid human life or industries. Technology uses knowledge to invent new devices or tools. Technology can make people's lives easier.Technology also applies conceptual knowledge to achieve practical goals, especially in a reproducible way. Technology is a collection of tools that enhance teaching and learning experiences across disciplines. Technology is an important teaching tool, especially in Mathematics education, and it can reshape Mathematics. Technology can be integrated into education at all levels of schooling and of Mathematics teaching (Abidin, Mathrani& Hunter, 2017). Technology allows teachers to connect mathematical concepts to real-world problems, enabling students to explore them. Moreover, technologies used in Mathematics teaching increase pupils' participation in the Mathematics learning process (Getenet, 2020).

Mathematics technology refers to computer-based tools and software applications designed to support mathematical learning, problem-solving, and research. It ranges from basic calculators and hardware with explicit mathematical purposes to computer algebra systems, graphing tools, spreadsheets, dynamic geometry environments, and applets that focus on mathematical concepts. It also encompasses mathematical concepts in practice (Popenici& Kerr, 2017).

Local technology in Mathematics refers to the use of available, often community-specific tools, techniques, and resources that range from traditional manipulatives to localized digital tools to enhance the teaching and learning of mathematical concepts. Its sustainability, lower cost and adaptation to the local environment often serve as a community-based substitute for imported, large-scale or modern industrial technology. Local technology refers to technological solutions developed within a specific region or country, rather than adopting foreign or imported technology. Companies, entrepreneurs, academic institutions or even local communities can create this technology to address specific challenges and needs in their environment. Local technology can encompass a wide range of areas, such as software, hardware, electronics, biotechnology, renewable energy, agricultural manufacturing, among others. It can take the form of products, services, innovative applications or processes developed and used locally (Ram, 2015).

The role of technology in teaching and learning Mathematics

Technology, according to Hamdi (2023), is a platform that lets students interact with mathematical topics through materials such as video tutorials, interactive lectures, and virtual simulations. It also helps teachers differentiate instruction and provide a more personalized learning experience. It makes it easier to adapt content to each student's needs and pace, which can improve student engagement with Mathematics and help improve their understanding of mathematical concepts. Technology helps students model mathematical relationships in real-world situations and can also support simple computation and the visualization of mathematical situations and relationships.

It provides immediate, high-quality feedback that improves instruction, engages pupils, and deepens understanding of key concepts. Using technology helps educators make decisions based on students' progress, allowing them to monitor and adapt resources to students' needs. Technology can support communication, collaboration, critical thinking, and the development of mathematical skills in pupils. It can create easy access to information, learning opportunities, and resources for learners.Technology makes learning more flexible and interesting, and reduces pupils' perception of Mathematics as an abstract subject.

It allows instant assessment and feedback, enabling students to identify and correct mistakes in real time and promoting a deeper understanding of the material.

Viberg, Grönlund, and Andersson (2020) argue that technology needs to be integrated into Mathematics for two reasons: many students find it difficult to learn, and technological tools will help with this; utilising digital tools with good pedagogy has the potential to assist learners in acquiring various skills such as critical thinking and problem-solving. Plus, it fosters positive attitudes toward maths education, increases involvement and reduces worry and panic. Technology applications in primary school mathematics classrooms improve teaching quality and enhance students' learning experiences (Hsu, 2013). Battista (2001) classified instruments used in teaching mathematics into three groups. Broad technology tools (e.g. Kahoot, Blendspace) are tools not specifically created for teaching mathematics. Other features are technology instruments used in mathematics, such as calculators, electronic spreadsheets, and statistical applications. The last segment includes technical tools for learning mathematics, which are designed to help kids learn mathematics (e.g. GeoGebra).

According to Attard (2017), educators use technology in a variety of ways, including:
Explain Everything, EduCreations, and ShowMe are examples of show-and-tell programs that let students use speech and visuals to present and explain mathematical solutions. Flipped learning is when teachers use technology to replace traditional classroom instruction. Students can access mathematical explanation videos or apps on YouTube from anywhere and at any time. Subscription-based resource packages such as Matific offer interactive, game-based learning exercises, and teachers can assign tasks to specific pupils and monitor their progress.

Camera, Google Earth, Google Maps, and geocaching are examples of general apps that let students study mathematics outside the classroom.

Benefits of Local Technology in Teaching Mathematics

Local technology, according to Attard (2017), refers to tools, techniques, and systems developed and used within a specific community or region, often tailored to local needs and resources. It refers to the technology

people use to support daily activities—for example, producing food items and medicines. In addition, local technology refers to technology used to make products in local areas. Local technology typically uses manual methods and local resources, while modern technology often incorporates advanced machinery and automation. Local technology plays a vibrant and unique role in improving Mathematics teaching and learning in primary schools. Integrating tools and methods that are familiar and accessible within the community will enhance educators' engagement, deepen understanding, and foster practical problem-solving skills in Mathematics teaching.

According to Attard (2017), there are various benefits of using local technology in primary school mathematics instruction, including:

- Better Understanding in Familiar Contexts: Local technology gadgets such as counting beads, abacuses, and educational programs help children learn mathematical concepts. Students can connect mathematical operations to real-world problems when they are taught with materials that reflect their surroundings.
- Encourages Active Learning and Participation: Students are encouraged to actively participate in their education by using interactive tools such as locally manufactured board games, puzzles, and digital platforms. Practical exercises boost engagement by making mathematics less scary and more fun.
- Encourages Innovative Problem Solving: Using locally available technology to teach mathematics fosters creativity and practical application. Toddlers, for example, may literally understand concepts of length, weight, and volume when using common measurement tools such as weighing scales and measuring tapes.
- Closes the Digital Gap: Using local technology offers fair learning opportunities in regions where access to mainstream digital tools is restricted. Locally developed mobile applications, instructional films in native languages, and community-driven educational activities help to address digital access gaps.
- Promotes Teacher Development: Local technology enables teachers to construct individualised lesson plans that align education with students' learning needs. Teachers can improve their instructional techniques and teaching strategies by using tools that let them interact and share lesson ideas.

Ethno mathematics

Ethnomathematics teaches mathematics using materials available in the child's immediate culture and environment. 'Ethno' describes a group's cultural uniqueness, such as language, beliefs, values, food and dress, habits, and physical traits. 'Mathema' means explain, understand, or know, and 'tics' means 'techne,' which is rooted in art and techniques. Ethnomathematics is defined as the ways, skills, and means of comprehending, managing, describing, and linking our social and natural environment with Mathematics (Mania &Alam, 2021). Ethnomathematics addresses concepts of reality and action in space and time, and ways of comparing, classifying, explaining, generalizing, inferring, and, as part of every action, quantifying, measuring, and evaluating. Mathematics teaching can become more effective and interesting by using an ethnomathematics approach based on learners' past and current experiences with everyday activities (Pradhan, 2019). In most traditional African societies, oral transmission of this kind of Mathematics is passed on to subsequent generations and still meets users' immediate needs. Mathematics historians and Mathematics instructors in Africa are currently interested in exploring ethnomathematics. Many researchers have referred to this branch of Mathematics by several titles, including traditional Mathematics, mathematical heritage, native Mathematics, natural Mathematics, and non-standard Mathematics. Ethnomathematics links mathematics and culture. In other words, ethnomathematics connects the child's environment to Mathematics by bringing Mathematics and culture together. Ethnomathematics transcends all academic fields. It is Mathematics practiced by recognized cultural groups. It covers a wide range of concepts, from different numerical and mathematical systems to multicultural Mathematics instruction. It aims to deepen understanding of culture and Mathematics, primarily by highlighting the linkages between the two. It stresses mathematical procedures with cultural roots. The teaching and learning of Mathematics using an ethnomathematics approach is a creative, cultural, and activity-based approach (Ekwueme, 2013), as it involves an investigation of the various ways that people think mathematically across cultural groups, as well as how Mathematics is used in science, technology, engineering, and other fields. Notably, every community, regardless of the sophistication of its civilisation, creates a type of Mathematics that helps its members solve daily problems. Mathematical concepts and ideas in the cultural practices and social activities of a cultural

group in southern Nigeria are more prominent in their occupations and crafts, as seen in their social activities, modes of measurement, and counting systems. For example, pottery, traditional buildings that portray geometrical shapes, traditional games, folklore, and so on.

Conclusion

The world has become a global village through different technologies, but some people in remote areas of developing nations still struggle to keep up with technological advancements. This study revealed the importance of local technologies in teaching primary Mathematics by emphasizing the need to develop children's technological ideas using things available in their environment. For primary school pupils to move with the world and technological advancement, there is a need for Mathematics teachers to teach primary school pupils with the local technologies available in the child's environment and culture.

Recommendations

1. The use of local technology in teaching Mathematics to primary school pupils should be encouraged by the teachers by referring the pupils to the local technologies in their environment while teaching Mathematics.
2. More local technological tools should be established among primary school pupils to develop their creative thinking.
3. Mathematics educators, policymakers, and curriculum developers should encourage primary school pupils to always use local technologies available in their environment to make mathematics learning interesting, even if they have no opportunity to relate to modern technology.

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