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# ICAS: Infographic Contextualized Akeanon Stories for Mathematical Problem-Solving Skills of Grade Three Learners

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**Index Terms:**

Akeanon stories, collaborative learning, contextualized learning, culturally responsive pedagogy, mathematical problem-solving, student engagement

**Abstract.** This study aimed to investigate the effectiveness of the ICAS: Infographic Contextualized Akeanon Stories as an intervention to improve the mathematical problem-solving skills of Grade Three learners at Kalibo Elementary School during the 2023-2024 academic year. Utilizing a qualitative research design, the study explored the experiences of learners and teacher-researchers in implementing this culturally relevant approach to math instruction. The intervention incorporated local Akeanon narratives alongside mathematical word problems, fostering a deeper connection between students and the content. Data were collected through observations, interviews, and reflections, revealing increased student engagement, enhanced problem-solving abilities, and a more positive attitude toward mathematics. Learners expressed a stronger sense of relevance and ownership over their learning, while teacher-researchers noted significant shifts in classroom dynamics and instructional strategies. The findings suggest that contextualized storytelling not only improved students' mathematical competencies but also promoted collaborative learning and critical thinking. This study highlights the potential of culturally responsive pedagogy in enhancing educational outcomes and recommends further exploration of similar interventions across diverse educational contexts.

## Introduction

Problem-solving activities are often seen as a way to bridge the divide between real life and the mathematics classroom. However, students around the world often perform poorly on problem-solving tests. Even when students have mastered the technical competencies of doing mathematical operations such as addition, subtraction, multiplication, or division, they can still find it hard to work out solutions to word problems that involve applying those mastered techniques (Morales et al., 1985, cited by Watson, 2013).

Both literacy and numeracy skills need to be addressed to perform academically in the classroom. Learners need these abilities to comprehend and analyze complex concepts and to write and speak about their thoughts successfully. Literacy skills, specifically comprehension skills, are also necessary for learners to understand mathematical concepts and apply them to solve problems.

At Kalibo Elementary School, some learners need help with literacy and numeracy. Eight (8) learners were left behind in terms of their problem-solving skills. They were non-numerates based on the results of the Enhanced Regional Unified Numeracy Test (E-RUNT) in the previous school year. They were also identified as "refreshers" in their Comprehensive Rapid Literacy Assessment (CRLA) results. Given this background, these learners need help with numeracy and literacy. These Grade Three learners were significantly affected by pandemic-related learning gaps, making the problem more complicated. These learners were not able to learn the fundamental skills from Kinder through grade two because there was strict enforcement of no face-to-face classes during the pandemic. Now that they are at the third-grade level, they experience difficulty in understanding math problems, and their problem-solving skills are affected.

The teacher-researcher aimed to improve the problem-solving skills of selected Grade 3 learners at Kalibo Elementary School. The teacher-researcher believed that if these learners mastered problem-solving skills, they would also improve

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their comprehension. As observed, these learners enjoyed the activities given to them when pictures were included in the story. They could easily understand the story's content, even if they had a hard time solving the mathematical problems. According to İlter (2014), allowing students to use mathematical concepts in the context of a story contributed to their mental development. In addressing emotional needs, problem-solving, and helping children feel comfortable in the classroom, stories served both pedagogical and social functions. The stories served as pedagogy for comprehension and literacy, and, socially, for example, in communication among children, classmates, and others around the world.

The researchers also believed that if they created a contextualized picture story combining math word problems, the learners would enjoy the problem-solving activities because they could relate to the content of the story through contextualized Akeanon stories in their own dialect. This intervention was called ICAS: Infographic Contextualized Akeanon Stories in Mathematics Problem-Solving Activities. Through this, the learners improved their problem-solving skills as they engaged with a new teaching strategy that heightened their interest.

Generally, the researcher aimed to determine the experiences of learners and teacher-researchers in using ICAS (Infographic Contextualized Akeanon Stories) to develop the Mathematical Problem-Solving Skills of Grade Three Learners at Kalibo Elementary School for the school year 2023-2024.

*Research Questions*

1. How can the ICAS: Infographic Contextualized Akeanon Stories be used to improve the mathematical problem- solving skills of Grade Three learners?
2. What is/are the experiences of Grade Three learners in their mathematical problem- solving activities using ICAS: Infographic Contextualized Akeanon Stories?
3. What is/are the experiences of the teacher- researcher in teaching using ICAS: Infographic Contextualized Akeanon Stories?
4. What action plan can be taken after the conduct of the study?

*Assumptions of the Study*

This study is premised on several fundamental assumptions regarding the participants and the intervention. First, it is assumed that integrating culturally relevant pedagogy, specifically through the ICAS (Infographic Contextualized Akeanon Stories) intervention, will naturally stimulate the interest and engagement of Grade Three learners by allowing them to relate mathematical concepts to their own local language and everyday experiences. Second, the researchers assume that mastering contextualized mathematical problem-solving skills will subsequently foster an improvement in the learners' reading comprehension abilities. Lastly, it is assumed that the data gathering instruments—including the observation checklists, journals, and open-ended interview guides—will elicit honest, accurate, and reflective insights from both the teacher-researcher and the learner-participants regarding their true experiences throughout the three-month implementation period.

## Methodology

This action research utilized ICAS (Infographic Contextualized Akeanon Stories) as an intervention to improve the mathematical problem-solving skills of Grade Three learners in Kalibo Elementary School.

Storytelling in mathematics education used stories that included mathematical content in mathematics lessons. When the linkage between mathematics and literature made mathematics more vivid, it was stated that teachers had a natural way to make students see mathematics (Akt Kır; Moyer, 2000).

ICAS (Infographic Contextualized Akeanon Stories) was a mathematical language-based set of stories that helped students understand mathematical concepts in depth. The mathematical concepts in the stories were presented in a more comfortable way in the learners' minds, which contributed to their mental processes. After reading the story, the learners analyzed the mathematical word problems stated in the story and solved them.

As an intervention, the teacher-researcher used ICAS (Infographic Contextualized Akeanon Stories) in a way that the Grade Three learners who needed help in improving their mathematical problem-solving skills were guided to understand how to solve word problems through Akeanon stories. This was done three times a week as part of their numerical intervention. The uniqueness of this intervention was that the short stories included were in Akeanon, created by the teacher-researcher, and contained word problems to be analyzed and solved by the learners. A contextualized problem-solving activity was designed with infographics to make the short stories more comprehensible.

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ICAS (Infographic Contextualized Akeanon Stories) is anchored to the theory of Constructivism. It is the re-creation of subjective meanings of the individual in their own cognition, real life situations and context-centered rich experiences with inter-subjective processes (Yurdakul, 2011). In constructivism, the teacher supplies to increase the curiosity of the learner. Teachers show new situations that can enable learners to develop new perspectives on these concepts with the activities at the last stage (Akyol, 2006).

Moreover, metacognitive by Jean Piaget and Lev Vygotsky plays a vital role in the scaffolding of knowledge through ICAS (Infographic Contextualized Akeanon Stories) in a mathematical problem solving activity. Piaget believed that children take an active role in the learning process, acting much like little scientists as they perform experiments, make observations, and learn about the world. As kids interact with the world around them, they continually add new knowledge, build upon existing knowledge, and adapt previously held ideas to accommodate new information (Kendra, 2022). On the other hand, Lev Vygotsky recommends that teacher assists the child to progress through the Zone of Proximal Development by using scaffolding. This zone lies between what a learner can achieve alone and what a learner can achieve with expert guidance. The teacher as expert initially takes responsibility for monitoring progress of scaffolding with the use of ICAS (Infographic Contextualized Akeanon Stories), setting goals on the aim of improving their problem- solving skills, planning activities and allocating attention through picture/infographics. Gradually, the responsibility for these cognitive processes is given over to the learner. The learner becomes increasingly capable of regulating his or her own cognitive activities.

The teacher- researcher will use this intervention called ICAS (Infographic Contextualized Akeanon Stories) to the Grade three learners at Kalibo, Elementary School as part of its Remedial Numeracy Class. The intervention will be done three times a week for three (3) months in the second quarter of the school year 2023-2024. There are eight (8) learners identified as participants based on the result of their E-RUNT, CRLA, Anecdotal Records and through various problem-solving activities conducted by the teacher- researcher in their Math Class.
The strategic plan for the implementation is reflected in table 1:

| Activity | Person/s Involved | Role/Responsibility | Time Frame | Location/Venue |
|---|---|---|---|---|
| *Pre- Implementation Phase* | | | | |
| Initial Survey based on records and observation | Teacher- Researcher<br>Adviser<br>School Head | The teacher- researcher will check the record of the E-RUNT results to identify the non-numerates and CRLA for the"refreshers" who are in the transitioning level. | September 2, 2023 | Kalibo Elementary School Grade Three Classroom |
| Identifying the Participants | Teacher- Researcher | Purposively choose the participants with the use of the inclusion criteria. | September 5, 2023 | Kalibo Elementary School Grade Three Classroom |
| Preparation/ Development of the ICAS: Infographic Contextualized Akeanon Stories | Teacher- Researcher | The teacher- researcher will create the ICAS: Infographic Contextualized Akeanon Stories and submit for validation to the school Learning Resources Coordinator. | September 8- 30, 2023 | Kalibo Elementary School Grade Three Classroom |
| *Implementation Phase* | | | | |
| ICAS: Infographic Contextualized Akeanon Stories<br><br>Problems of the Day:<br><br>There will be 3 problems to be discussed a day, | Teacher- Researcher<br>Participants | For each problem- solving activity, the role of teacher and learners will follow the same steps:<br><br>Step 1: The teacher will read aloud the story that will be created by the teacher- researcher. | 3 months of repeated problem- solving activity with the use of ICAS: Infographic Contextualized Akeanon Stories<br><br>(October- December, 2023) | Kalibo Elementary School Grade Three Classroom |

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| | | | | |
|---|---|---|---|---|
| every learning session for the span of 3 months. | | Step 2: With the use of the teacher- made pictures/infographics, the learners will connect the ideas and understand what the story is all about.<br><br>Step 3: Then, the teacher will check if the learners understand the scenario and the problems present in the story.<br><br>Step 4: After checking, the learners will analyze the problem and list down the variables that need to be solved. And they will do the problem-solving activity.<br><br>Step 5: After answering the scaffolding of what they have learned from the story will be processed by giving questions related to the story to test their comprehension and understanding as they relate the answers in the problem-solving activity given in the story. | | |
| *Post- Implementation Phase* | | | | |
| Mathematical Problem- Solving Skills Assessment | Teacher- Researcher Participants | The teacher will conduct a Mathematical Problem-Solving Skills Assessment to see if there is an improvement in their Problem- Solving skills | January 2024 | Kalibo, Elementary School Grade Three Classroom |

*Table 1: Component Activity*

As shown in Table 1, the intervention will be implemented with three phases. This remedial numeracy intervention is intended for three (3) months of implementation. Every week, there will be 3 sessions (Wednesday, Thursday, and Friday). The sample of ICAS (Infographic Contextualized Akeanon Stories) is attached in Annex C. The process of using ICAS (Infographic Contextualized Akeanon Stories) follows five steps which will be repeated during their learning sessions in order to observe the effectivity of the intervention and to see the improvements of the learners in their problem- solving skills. The teacher-researcher believes that ICAS (Infographic Contextualized Akeanon Stories) is an answer to the demand of the 21st Century skills of the learners which are critical thinking, collaboration and communication. By making drawings or using hands-on teaching aids (manipulatives or props) to depict the story or mathematical problem can also help learners to understand the problem and physically see the relationships between different variables. Moreover, the teacher-researcher identify the intervention and innovation as the possible effective strategy to answer the learning gaps of the students in literacy and numeracy.

The participants of the study will the nine (9) including the teacher-researcher and Grade Three learners enrolled at Kalibo, Elementary School, Kalibo, Aklan, during the Second Quarter of the School Year 2023-2024. The profile of the learner-participants is shown in Table 2.

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| Pseudonyms | Sex | Grade Level | Socio-Economic Status (Lower Class, Middle, Average, Upper Class) |
|---|---|---|---|
| Dianne | F | Grade Three | Lower Class |
| Mila | F | Grade Three | Lower Class |
| Jane | F | Grade Three | Middle Class |
| Gina | F | Grade Three | Lower Class |
| Bert | M | Grade Three | Middle Class |
| John | M | Grade Three | Middle Class |
| Kevin | M | Grade Three | Middle Class |
| Mark | M | Grade Three | Middle Class |

*Table 2. Profile of the Learner- Participants*

There were nine (9) total number of participants in the study. One teacher- researcher which is female handling the learners in Grade Three and eight (8) learner- participants with the age ranging from 9 to 10 years old. This group of participants will be chosen purposively based on the inclusion criteria:

> *Criterion 1:* They are considered as "Non- Numerates" in their Enhanced Regional Unified Numeracy Test (E-RUNT).
> *Criterion 2:* Learners involved in the "Transitioning Level" where in they need to master more complex literacy competencies and skills.
> *Criterion 3:* Learners are enrolled in Grade Three at Kalibo Elementary School for the School Year 2023-2024.

Also, the teacher-researcher was counted as a participant in this study in order to determine the experiences and observations gained from the implementation of the intervention called ICAS: Infographic Contextualized Akeanon Stories. The teacher-researcher is handling the class in Mathematics, female, 36 years old, and 15 years in service. The researcher herself is a Learning Resource coordinator who is capable of editing digital learning materials.

Prior to the conduct of the actual study, the researchers secured the necessary permit and permission will be sought from the Schools Division Superintendent, Division of Aklan, to conduct the study at Kalibo, Elementary School, Kalibo, Aklan. After the approval, copies of the endorsement letter from the Office of the Schools Division Superintendent will be sent to the Office of the School Head and permission will also be sought to utilize the Grade Three learners in the study.

The data to be used in this study were the learners' observation checklist, teacher-researchers' observation checklist, Learner's Journal and the interview guide questions.

Learners' Observation Checklist. The teacher-researcher distributed the learners' observation checklist to the participants to be filled up every week to use as guide in identifying their behavior and responses with the reading strategy as well as to determine if learnings take place during the conduct of the intervention.

Teachers' Journal. The teacher-researcher observed and recorded the behavior of the learners in every intervention using the teachers' journal. This data gathered served as basis in enhancing the intervention and to improve the delivery of the lesson. Learners will also list down their experiences in the learner's journal in order to have a record of their own experiences during the intervention.

Learners' Journal. The participants recorded all the experiences they had during the intervention in their journal in order to see if the Picture Story Sequencing gives them a remarkable experience as part of their remedial reading sessions.

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Interview Guide. At the end of actual study, the participants were asked to fill up the interview-guide questionnaire. It will compose of five-open ended questions which will gather the learners' insight and learning experiences during and after the conduct of the intervention (See Annex C). They will be encouraged to give a full answer, rather than the simple "yes" or "no" response that is usually given to a closed-ended question. Not only are these questions designed to elicit a longer and more detailed response, but they, likewise, ask the respondent to take extra time to consider what is being asked of them and what they should say. Furthermore, open-ended questions are for gathering insights rather than just answers.

The researcher randomly selected five participants to participate in Focus Group Discussion (FGD) in order to elicit their feedbacks about the activities. The objectives and the initial results of the study will be presented to the participants so that they could give their truthful responses, insights, and opinions according to what they really experienced, observed, and learned during the conduct of the intervention. Furthermore, they could also share their suggestions and recommendation for the improvement and enhancement of the intervention. As cited by Masadeh (2012), Focus Group Discussions are used in some studies as one of the research methodologies because of their ability to actually generate items for the development of a questionnaire. Focus Group Discussions also enable the researcher to drill more deeply to attain in-depth insights into the researched topic as well as to collect a certain amount of information and opinions from a small number of people in a short time. The primary goal of Focus Group Discussions in these cases is not to generalize, but simply as a step to help develop a set of questions to be asked in the subsequent questionnaire.

Learners' answers from the interview guide question and focus-group discussion will be gathered, transcribed, and interpreted. Thorough evaluation of the result is the mainstream as to the efficacy of the intervention. The progression will determine the acceptance of the intervention and the opposite is for rejection. Rejection may follow for revisiting the innovation for deep planning and crafting alternative innovative plan.

The final findings of the study were discussed again to the participants in order to verify the validity and accuracy of the results. It was presented to the Division Research Committee for more suggestions and recommendation for its improvement.

This study utilized the qualitative data using thematic analysis. The thematic analysis will be used to determine the experiences of learners in integrating ICAS: Infographic Contextualized Akeanon Stories in improving the Mathematical Problem- Solving Skills of Grade Three learners at Kalibo, Elementary School. According to Lochmiller (2021), thematic analysis enables researchers to define and describe what a participant's reality is using their own written or spoken account. It is usually applied to a set of texts, such as an interview or transcripts. The researcher closely examines the data to identify common themes – topics, ideas and patterns of meaning that come up repeatedly (Caulfield, 2022). The pattern of meanings that thematic analysis allows the researcher to identify need to be important in relation to the particular topic and research question being explored (Braun & Clarke, 2012).

To analyze the data using thematic analysis, six phases of thematic analysis will be used (Braun and Clarke, 2006 in Naelgas, 2022). This should not be viewed as a linear model, where one cannot proceed to the next phase without completing the prior phase (correctly); rather analysis is a recursive process (Naelgas, 2022).

## Results and Discussion

This part contains the result and analysis of the qualitative data to determine the experiences of the learners Experiences of Learners Using ICAS: Infographic Contextualized Akeanon Stories be used to improve the mathematical problem- solving skills of Grade Three learners, categorized into themes: (1) The use of ICAS: Infographic Contextualized Akeanon Stories to improve the mathematical problem- solving skills of Grade Three learners. (2) The experiences of Grade Three learners in their mathematical problem- solving activities using ICAS: Infographic Contextualized Akeanon Stories. (3) The experiences of the teacher- researcher in teaching using ICAS: Infographic Contextualized Akeanon Stories.

*The Use of ICAS: Infographic Contextualized Akeanon Stories To Improve The Mathematical Problem - Solving Skills Of Grade Three Learners*

The findings of the study revealed that the use of ICAS (Infographic Contextualized Akeanon Stories) as an intervention significantly improved the mathematical problem-solving skills of Grade Three learners. The learners demonstrated noticeable progress in analyzing and solving word problems after being exposed to the ICAS intervention.

Before the implementation of ICAS, many learners struggled with understanding the context of mathematical problems, often due to unfamiliar language and abstract scenarios. However, after engaging with the stories written in Akeanon, they were able to relate more easily to the situations presented, which in turn enhanced their comprehension. The use of infographics provided visual support, which helped in breaking down complex problems into manageable steps.

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*As shared by the participants:*

Participant 1: *"Dati mam, kalisod gd a mag suma sa math. Makaron hay mas nag eomo."*
*(Before, it was so hard to solve Math problems. Now, it's easier.)*
Participant 2: *" Naila eon ako mam gasueod sa Math nga klase. Kakaiba."*
*(I like to attend classes in Math. It's different than before.)*
Participant 3: *"Mas naeobtan ko mam it mayad."*
*(I understand it better.)*
Participant 4: *"Bukon eon mam it malisod kakon. Mas abo ang haoebtan eon makaron. "*
*(It's not that difficult for me. I learned and understand a lot.)*
Participant 5: *"Mas madali maintindihan mam kapin ga solving problems."*
*(It's easier to understand especially in solving problems.)*

As observed, there is an improvement in the learner's participation and engagement during the intervention. Increased scored in their quizzes and exams. The learners appeared more motivated and confident in solving math problems when these were presented in story form, particularly stories that reflected their culture and everyday experiences. This suggests that contextualized learning materials, especially those presented in the mother tongue, can effectively bridge the gap between mathematical concepts and real-life application.

Furthermore, a related study conducted by van den Heuvel-Panhuizen and Elia (2022) supports this finding. They emphasized that the use of visuals, such as pictures and infographics, in mathematics instruction helps students interpret mathematical problems more effectively and encourages meaningful learning. The study affirmed that integrating storytelling into mathematics instruction promotes a deeper understanding of problem-solving processes. The learners not only improved in their ability to solve problems but also demonstrated growth in critical thinking and reasoning skills.
The use of ICAS proved to be an effective tool in enhancing the learners' mathematical problem-solving abilities. It highlighted the importance of culturally relevant and visually enriched materials in supporting early grade mathematics education.

*The Experiences of Grade Three Learners In Their Mathematical Problem- Solving Activities Using ICAS: Infographic Contextualized Akeanon Stories*

Limited Conceptual Understanding

Before the intervention, learners exhibited varying levels of engagement during math lessons. Some appeared disinterested or distracted, often relying on rote memorization rather than conceptual understanding. Many learners struggled to connect mathematical concepts to real-world scenarios, leading to a lack of motivation to participate actively in problem-solving activities. According to the discussants during Focus Group Discussion (FGD) they really felt bored, tired and uninterested to learn.

*As to the participants:*

Participant 1*: "Indi ko man maeobtan abi ro istorya sa mga math problems namon, ngani pa chamba lang ako."*
*(I didn't understand the story in the math problem, so I just guessed the answer.)*
Participant 2: *"Kalisod mam ro Math dahil di ko maeobtan ro mga pangutana."*
*(Math was hard because the questions didn't make sense to me.)*

*Low Engagement in Traditional Math Instruction*

Learners expressed difficulty in understanding mathematical word problems due to unfamiliar language, lack of context, and reliance on rote memorization. Their limited connection to real-life applications of math led to disengagement, confusion, and reduced motivation to participate in problem-solving activities.

*As expressed by the participants:*

Participant 3: *"Nadumduman ko eang kon paalin, pero owa ko kasayud kon para sa alin." (I only remembered the steps, but I didn't know why I had to do them."*
Participant 4: *"Naduyog tang ma'am hay pauman uman manlang."*
*(I felt sleepy during math class because it was always the same and I didn't get it.)*
Participant 5: *"Kun magsuma hay gasala tang ko nano unahon."*

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*(When we solve word problems, I get confused and don't know what to do first.)*

*Increased Engagement and Cultural Connection*

During the implementation of ICAS, the learners reported a significant improvement in their engagement and enjoyment during math problem-solving activities when using the ICAS intervention. The use of contextualized Akeanon stories helped them relate more personally to the content, making the learning experience more meaningful. This alignment with their cultural background appeared to foster a greater sense of connection and relevance to the mathematical concepts presented.

*As to the participants:*

Participant 1: *"Naila tang sa mga storya hay inakeanon abi, mingko kilaea ko ta rom ga tawo."*
*(I liked the stories because they were in Akeanon—it felt like the problems were about people I know.)*
Participant 2: *"Masadya ta ro Math umpisa nga naga basa it storya ag may pictres pa sanda."*
*(Math became fun when we started reading stories with pictures and solving problems from them.)*
Participant 3*: "Mas naoebtan ko eon ro klase kasi rom ga stirya hay mingko kat naubr aman namon sa skulyahan o sa baeay." (I understand the questions better now because the stories are like things we do at home or in school.)*
Participant 4: *"Excited tang mam mag sabat sa mga solvings dahil may stories abi napapaisip ako kun ano matabo rayon." (I got excited to answer because the stories made me think more, and I wanted to find out the answer.)*
Participant 5: *"Kat mga pictures mam ag inakeanon nga mga storya hay nakabulig kakon nga mag imagine sa problema." (The pictures and the Akeanon words helped me imagine the problem better, so I knew what to do.)*

Many learners expressed enthusiasm for the stories, stating that the visual elements and relatable narratives helped them better understand complex mathematical problems. As a result, they felt more confident in their problem-solving abilities. This finding aligns with the literature that emphasizes the importance of culturally relevant pedagogy in enhancing student learning (Ladson-Billings, 1995). The context provided by the Akeanon stories allowed learners to visualize the mathematical problems, which facilitated comprehension and problem-solving.

*Teacher-Researcher's Experiences*

The teacher-researchers found that incorporating the ICAS strategy transformed their teaching approach. They observed that students who previously struggled with problem-solving showed increased interest and participation in class. The integration of local stories into math instruction not only engaged the learners but also provided the teachers with valuable insights into the students' thought processes and problem-solving strategies.

The teachers reported that the ICAS intervention allowed them to create a more interactive and supportive learning environment, where learners felt safe to express their thoughts and ask questions. This engagement led to more dynamic classroom discussions and collaborative learning experiences, enhancing the overall learning atmosphere.

*Improvement in Problem-Solving Skills*

After the intervention, the contextualized nature of the math problems helped learners apply mathematical concepts in real-life scenarios, promoting critical thinking and analytical skills. Many learners articulated how they could draw connections between the stories and the mathematical challenges they faced, which enhanced their problem-solving strategies.

Furthermore, the narrative structure of the stories encouraged learners to think creatively about solutions, demonstrating the potential of storytelling as a pedagogical tool in mathematics education. This approach aligns with findings from previous studies that highlight the effectiveness of narrative-based learning in promoting higher-order thinking skills (Miller, 2013).

*Action Plan*

The findings of this study demonstrate that the implementation of the Instructional Contextualized Action Stories (ICAS) framework significantly enhances mathematical instruction by bridging the gap between abstract mathematical concepts and the learners' real-life experiences. However, the data also reveals that the long-term success and sustainability of ICAS heavily depend on an institutionalized support system. Table 3 discuss these findings grouped into key thematic areas, which form the direct foundation of the study's post-conduct Action Plan.

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| Action Plan Component | Action | Timeline | Responsible Party | Resources Needed | Success Indicators |
|---|---|---|---|---|---|
| 1. Strengthening Teacher Preparation and Training | Conduct regular professional development workshops for teachers on using ICAS in math instruction. | Quarterly workshops; Monthly sharing sessions | School head, mathematics coordinators, teacher-researchers | Training materials, guest speakers, classroom resources | Increased teacher confidence, measured by feedback surveys and observations. |
| 2. Expanding ICAS Resources | Create additional ICAS stories based on various mathematical concepts and grade levels, focusing on learners' real-life experiences. | Ongoing development (3 new stories per semester) | Teacher-researchers, language experts, local community members | Time for story creation, art and infographic tools | Positive learner feedback, improved problem-solving performance. |
| 3. Enhancing Learner Engagement and Motivation | Organize group activities where learners collaborate to solve math problems through creative methods like role-playing and drawing. | Weekly math activity sessions | Classroom teachers, students | Space for activities, materials for drawing/role-playing | Increased learner participation and enthusiasm in math lessons. |
| 4. Monitoring and Assessment | Implement regular formative assessments to track learners' progress, using both written assessments and oral presentations. | After every 6-week instructional period | Teachers, academic coordinators | Assessment tools, rubrics for problem-solving skills | Improved assessment performance and retention of math concepts. |
| 5. Involving Parents and the Community | Engage parents and community members through math days or events where learners present their work and explain ICAS stories. | End of every semester | School management, teachers, parent associations | Invitations, event space, promotional materials | Increased parental involvement and support for learners' progress. |
| 6. Reflection and Continuous Improvement | Set up regular reflection sessions for teachers to discuss challenges and successes, making adjustments for future use of ICAS. | Monthly reflection meetings | Teachers, school leadership | Meeting space, feedback forms, time for sharing insights | Continuous improvement in teaching strategies, adaptation of ICAS based on feedback. |

*Table 3: Action Plan*

## Conclusion and Recommendations

The ICAS: Infographic Contextualized Akeanon Stories proved to be an effective strategy for enhancing the mathematical problem-solving skills of Grade Three learners. The integration of culturally relevant stories significantly improved students' engagement and understanding of mathematical concepts, demonstrating the importance of contextualization in learning.

The success of the ICAS (Infographic Contextualized Akeanon Stories) strategy implies that integrating local culture and visual aids into primary education is vital for boosting academic performance. By embedding mathematical concepts within familiar cultural narratives, educators can transform abstract problems into relatable, engaging lessons that significantly

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improve Grade Three learners' problem-solving skills. Ultimately, this highlights a critical need for curriculum developers and teachers to shift toward contextualized learning materials, proving that when students see their own identity and language reflected in their coursework, their cognitive understanding and academic engagement naturally thrive.

The study observed a notable improvement in the learners' problem-solving abilities. Students became more confident in approaching mathematical challenges, utilizing strategies that were informed by the contextualized stories. This suggests that narrative-based learning can facilitate higher-order thinking and deeper comprehension of complex concepts.

This finding implies that narrative-based learning serves as a powerful psychological catalyst, transforming how students perceive and tackle academic challenges. By anchoring complex mathematical concepts in familiar storytelling, the strategy not only equips learners with practical problem-solving frameworks but also dismantles the anxiety often associated with abstract subjects. This surge in student confidence and strategic thinking suggests that when education moves beyond rote memorization into narrative contextualization, it naturally fosters higher-order cognitive processing and long-term comprehension, proving that meaningful context is essential for building resilient, independent thinkers.

The intervention encouraged greater collaboration among students, promoting a supportive learning environment where learners felt comfortable sharing their thoughts and strategies. This shift in classroom dynamics not only enhanced peer interaction but also allowed for richer discussions and collective problem-solving efforts.

This shift implies that contextualized learning materials do more than just improve individual intellect—they actively reshape the social fabric of the classroom into a collaborative ecosystem. Because the localized stories gave students a shared cultural vocabulary and a common point of reference, it lowered the social risk of participating, replacing isolated math anxiety with collective curiosity. This suggests that when learning tools resonate culturally, they naturally spark peer-to-peer dialogue, transforming a traditional, teacher-centered classroom into a dynamic community where collective problem-solving and mutual support drive deeper educational growth.

The teacher-researchers experienced a transformation in their instructional approach, adopting more facilitative and interactive teaching methods. The integration of storytelling into math instruction enabled them to better understand students' thought processes and provide targeted support, thereby enhancing the overall teaching and learning experience.

This transformation implies that culturally contextualized teaching tools act as a powerful catalyst for professional growth, shifting the educator's role from a rigid dispenser of information to an adaptive facilitator of learning. By using storytelling as an instructional lens, teachers gain a clearer, more immediate window into their students' unique cognitive processes, allowing them to move away from generic lectures and toward highly targeted, real-time interventions. Ultimately, this highlights that when a curriculum is designed to be interactive and relatable, it not only elevates student comprehension but also re-energizes the teaching practice itself, fostering a more responsive, empathetic, and effective classroom dynamic.

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## Competing Interests Statement

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this article.

## Data Availability Statement

Data sharing is not applicable to this article as no new data were created or analyzed in this study; all data used were obtained from previously published sources as cited in the reference list.

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## Appendices

No appendices are attached to this study.

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