Evaluating the Effectiveness of a Contextualized and Gamified Instructional Intervention in Mathematics for Kindergarten Learners

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ABSTRACT

This action research evaluated the effectiveness of Project CLeaR PLAY (Contextualized Learning Resources through Play), a contextualized and gamified instructional intervention designed to improve the mathematics performance of kindergarten learners at Songco Elementary School, Schools Division of Borongan City, during School Year 2025–2026. The intervention was developed in response to the need for engaging, learner-centered, and developmentally appropriate mathematics instruction that promotes active participation and meaningful learning experiences. Project CLeaR PLAY integrates localized learning resources, play-based activities, and gamification strategies to enhance learners' understanding of foundational numeracy concepts. The study employed a quantitative action research approach using a one-group pretest-posttest design. Thirty kindergarten learners participated in the study through complete enumeration. A researcher-made mathematics achievement test was administered before and after the implementation of the intervention. Data were analyzed using descriptive statistics, including mean and standard deviation, and a paired-samples t-test to determine significant differences in learners' mathematics performance before and after exposure to the intervention. Results revealed that learners' mathematics performance improved from a pretest mean score of 5.43 (Low) to a posttest mean score of 13.17 (Very High). Statistical analysis further indicated a significant difference between the pretest and posttest scores ($t = 18.62$, $p = .001$), leading to the rejection of the null hypothesis. The findings demonstrate that Project CLeaR PLAY significantly enhanced the mathematics performance of kindergarten learners by providing engaging, contextualized, and play-based learning experiences. The study concludes that integrating contextualization and gamification in mathematics instruction can effectively strengthen foundational numeracy skills among kindergarten learners. It is recommended that teachers adopt and sustain similar instructional innovations and that schools provide support for the continued implementation and enhancement of contextualized and gamified learning resources. The intervention is illustrated through the Project CLeaR PLAY instructional framework.

INTRODUCTION

Early childhood education is essential to children as they develop the skills to become lifelong learners. In the Philippines, the Enhanced Basic Education Act of 2013 (Republic Act No. 10533) provides a framework for the creation of contextualized, learner-centered instruction that addresses the developmental and local needs of the learner. In alignment with this, the Department Education (DepEd) Order No. 47 s. 2016 states that kindergarten must adopt developmentally targeting, play-based methods of teaching that foster the active participation and holistic development of learners. In addition, the DepEd Order No. 8, s. 2015 brings to focus that assessment practices in the classroom should promote the desired learning and the continuous improvement thereof. These policy mandates advocate for teachers to utilize a variety of teaching methods in order to make the teaching and learning process more engaging, relevant, and responsive to the developmental needs of learners.

Among the core learning areas of kindergarten is Mathematics. Learning Mathematics develops young learners' understanding of numbers, patterns, shapes, measurement, and problem-solving. Unfortunately, many of the kindergarten learners in the country struggle with the learning of the basic Mathematical concepts due to the reliance on non-innovative, traditional teaching practices and standardized learning

resources. Traditional methods of teaching Mathematics fail to relate to children's everyday experiences, which results in low interest, low participation and the learner struggling with the teaching and learning of abstract Mathematical concepts. There is thus an impending need to innovate the teaching of Mathematics to young learners and make it more meaningful and fun.

Contextualized learning integrates new concepts with learners' previous experiences. According to Basibas (2020), learners better understand ideas with contextual resources because they can integrate real life with what they learned in class. Flores (2021) said contextualized instructional materials help learn and be active during class and help learners be motivated. These studies help resource and instructional material developers understand that instructional materials help learners develop through active participation. This is even more true in the context of young learners.

Similarly, in kindergarten, play-based learning is developmentally appropriate. Pyle and Danniels (2019) emphasized that play stimulates active learning. Play strengthens children's creativity and stimulates their learning. Play-based learning also helps develop children's understanding of concepts. Research studies (Lynch, 2020; Moore, 2020) also support the finding that structured play helps develop early literacy and numeracy. When used in the context of math, play-based learning can help create learning experiences that develop a child's creativity and a positive attitude.

While the advantages of contextualized and play-based learning are well documented, traditional teaching materials that do not engage learners or reflect the contextual realities of children are still commonly used in kindergarten classrooms. Because of this, many learners do not get the opportunity to learn about math in a fun and engaging way. Combining contextualized learning resources and gamified activities is one solution to help teach math in a more engaging and active way.

To address this demand, Project Clear PLAY (Contextualized Learning Resources through Play) was launched as a gamified, contextualized instructional intervention for kindergarten mathematics. This intervention combines localized learning resources and play-based activities to help children learn mathematics in a fun and interactive way, and in a way that is contextual to their everyday experiences. The focus of this action research is on measuring the effectiveness of Project CLeaR PLAY on kindergarten learners and the way that they learn mathematics. The anticipated results of the study aim to provide practical, evidence-based, and constructive advice to kindergarten educators for strengthening their mathematics instruction using contextualization and gamification, and in a way that aligns with the K to 12 curriculum and the principles of early childhood education.

RESEARCH QUESTIONS

This action research aims to evaluate the effectiveness of Project CLeaR PLAY, a contextualized and gamified instructional intervention, in improving the mathematics performance of kindergarten learners at Songco Elementary School, Schools Division of Borongan City during the School Year 2025–2026.

Specifically, this study seeks to answer the following questions:

1. What is the mathematics performance of kindergarten learners before and after the implementation of Project CLeaR PLAY, as measured by their:

2.1 pretest scores; and

2.2 posttest scores?

2. Is there a significant difference between the mathematics performance of kindergarten learners before and after the implementation of Project CLeaR PLAY?

3. What recommendations can be proposed based on the findings of the study to further improve mathematics instruction for kindergarten learners

METHODOLOGY

This study will employ quantitative action research utilizing a one-group pretest-posttest research design to evaluate the effectiveness of Project CLeaR PLAY, a contextualized and gamified instructional intervention in mathematics for kindergarten learners. The design involves administering a mathematics pretest before the implementation of the intervention and a posttest after its completion. The difference between the pretest and posttest scores will serve as the basis for determining the effectiveness of Project CLeaR PLAY in improving the mathematics performance of kindergarten learners.

Participants and/or Other Sources of Data and Information

The participants of the study will be the kindergarten learners of Songco Elementary School, Schools Division of Borongan City, during School Year 2025–2026. The study will employ complete enumeration, wherein all officially enrolled kindergarten learners in the class handled by the researcher will be invited to participate, subject to parental or guardian consent. This approach is appropriate for classroom-based action research, which seeks to address instructional concerns within the teacher's immediate teaching context.

Before the intervention is implemented, informed consent will be obtained from the learners' parents or guardians, and age-appropriate assent will be sought from the learners. The confidentiality of research data will be maintained, and participants' identities will be protected through the use of codes instead of names. Participation will be voluntary, and withdrawal will not affect learners' grades or access to instructional support. All collected data will be used solely for research purposes and handled in accordance with applicable research ethics and Department of Education requirements.

Data Gathering Methods

The study will be conducted in three phases: pre-implementation, implementation, and post-implementation.

During the pre-implementation phase, the researcher will secure the necessary approvals from the school head and the Schools Division Office. Parents or guardians will be informed about the study, and consent will be obtained before data collection. A researcher- made mathematics achievement test, validated by experts, will be administered as a pretest to determine the learners' baseline mathematics performance before the implementation of the intervention.

During the implementation phase, the researcher will implement Project CLeaR PLAY during regular mathematics classes for the prescribed intervention period. The instructional intervention will utilize contextualized learning resources integrated with gamified activities such as number games, matching activities, puzzles, scavenger hunts, spinner games, treasure hunts, badge collection, reward systems, cooperative challenges, and manipulative learning tasks. The lessons will cover kindergarten mathematics competencies including number recognition, counting, one-to-one correspondence, comparing quantities, shapes, patterns, classification, measurement, and simple problem-solving. Throughout the implementation, the researcher will monitor learners' participation, engagement, and classroom performance through observation and formative assessments.

During the post-implementation phase, the same mathematics achievement test will be administered as a posttest to determine the learners' mathematics performance after exposure to Project CLeaR PLAY. The results of the pretest and posttest will be compared to evaluate the effectiveness of the instructional intervention.

Data Analysis Plan

The collected data will be encoded, organized, and analyzed using the Jamovi Statistical Software.

Descriptive statistics, including the mean and standard deviation, will be used to describe the mathematics performance of kindergarten learners in the pretest and posttest. The mean will indicate the average level of mathematics performance, while the standard deviation will describe the variability of the learners' scores.

To determine whether there is a significant difference between the mathematics performance of the learners before and after the implementation of Project CLeaR PLAY, a paired-samples t-test (dependent samples t-test) will be employed at the 0.05 level of significance. This statistical test is appropriate because it compares two related sets of scores obtained from the same group of participants before and after the intervention. The findings will be presented using tables and narrative discussions. The results will serve as the basis for determining the effectiveness of Project CLeaR PLAY and for formulating recommendations to enhance mathematics instruction among kindergarten learners.

Proposed Innovation, Intervention, and Strategy

Project CLeaR PLAY (Contextualized Learning Resources through Play)

Project CLeaR PLAY (Contextualized Learning Resources through Play) is a gamified intervention designed to address the gap in kindergarten learners' mathematical competencies. It utilizes gamification, contextualized learning, and developmentally appropriate play to enhance the quality of kindergarten mathematics instruction. Project CLeaR PLAY aims to address the gap in kindergarten learners' mastery of basic math concepts facilitated by the use of traditional instructional materials. Through participation in structured play, kindergarten learners are given the opportunity to learn the numeracy skills they need in learning experiences that are reflective of their everyday contexts.

Traditional instructional materials that are designed for direct teacher-led instruction are the focus of most instructional resources. In contrast, Project CLeaR PLAY focuses on active participation of the learners. It promotes exploration and discovery through developmentally appropriate games and activities. The intervention appreciates that young children learn mathematical concepts by playful experiences and use of everyday objects and situations.

Components of Project CLeaR PLAY

The components of Project CLeaR PLAY include a Teacher's Guide, Contextualized Activity Cards, learning resources that can be manipulated, Game Resources, and Assessment Sheets. Each lesson is designed to align with the Kindergarten Mathematics Curriculum of the Department of Education and provides opportunities for the development of foundational numeracy skills through play and local contextual learning.

The instructional materials contain photographs and illustrations of community familiar objects (local fruits and vegetables, domestic and/or farm animals, tools for fishing, household materials, means of transportation, and community helpers). The learning scenarios help learners visualize community activities and cognize the relevance of the concepts, thus facilitating concrete learning. Each learning activity consists of visual aids, illustrations of an appropriate size, simple instructions, worksheets and manipulative. The instructions are printed in a child-friendly style with large lettering and attractive colors on laminated cards that are designed for repeated use in the classroom.

Content of the Instructional Material

Project CLeaR PLAY addresses the primary mathematics competencies for kindergarteners. The instructional materials provide opportunities for learning about the recognition of numbers, counting, one-to-one correspondence, comparison of quantities, ordering of numbers, identification of shapes, recognition of patterns, classification of objects, measurement, and problem solving. Each lesson consists of a brief introductory activity, and is followed by guided learning, and collaborative, structured free play, and is concluded with an informal assessment. Concrete resources are the caps of bottles, shells, leaves, sticks, pebbles, flashcards, puzzles, and locally available resources. Learners perform the activities of mathematics using manipulations of concrete materials, thus learning through observation, movement, and interaction.

Gamification of Learning Activities

Gamification is central to our work with Project CLeaR PLAY. The researcher incorporate game elements into every single math lesson. This is an effective, age-appropriate way to promote student engagement during instruction. Game elements we use include: Collecting badges, point systems, reward stars,

classroom leaderboards, challenge cards, treasure hunts, mystery boxes, matching games, number races, dice games, puzzle games, and team competitions.

Reward stars and badges are received after completing classroom challenges. These rewards are earned by making an effort, participating, and mastering a task. The researcher reward all of these elements, which supports their confidence and motivates them intrinsically. The best part of the challenge is the cooperation and teamwork it builds. The continued support and guidance is given through observation and formative assessment by the teacher. The researcher also incorporate a variety of movement activities. The researcher use hopping to number spots, bean bag counting games, shape scavenger hunts, counting relay races, and games played on the floor. With these activities the researcher combine movement and math. These activities allow kids to learn engaged and active.

Instructional Strategy

Project CLeaR PLAY adopts a learner-centered instructional strategy following the gradual release of responsibility model. Each lesson begins with teacher modeling of mathematical concepts using contextualized learning resources. This is followed by guided practice wherein learners complete tasks with teacher support. Subsequently, learners participate in collaborative games and independent activities that reinforce newly acquired concepts through meaningful play.

The intervention also promotes peer interaction, cooperative learning, questioning, storytelling, singing, and role-playing to sustain learner engagement. Teachers serve as facilitators who guide learners, provide immediate feedback, and encourage reflection throughout the learning process.

Uniqueness of the Intervention

The uniqueness of Project CLeaR PLAY lies in its integration of contextualization and gamification within a single instructional package specifically developed for kindergarten mathematics. While many instructional materials emphasize either localization or play-based learning, this intervention combines both approaches using structured classroom games that are directly aligned with the mathematics curriculum. It also utilizes inexpensive, locally available materials, making it practical, sustainable, and easily replicable in public elementary schools with limited resources.

Furthermore, the intervention provides teachers with ready-to-use lesson guides, activity cards, manipulatives, assessment tools, and game mechanics that reduce preparation time while promoting consistent implementation across mathematics lessons.

Implementation Strategy

Project CLeaR PLAY will be implemented using three phases. During the pre-implementation phase, learners will take a mathematics pretest to determine their baseline performance. The teacher will prepare the instructional materials, organize the classroom learning stations, and orient learners regarding classroom routines and game mechanics.

The implementation phase will span several weeks, during which the teacher will integrate Project CLeaR PLAY into regular mathematics lessons. Every session will include motivation, guided instruction, contextualized play activities, collaborative games, independent practice, and formative assessment. Learners' participation, engagement, and classroom performance will be monitored continuously throughout the intervention period.

The post-implementation phase will involve administering the mathematics posttest to determine improvements in learners' performance after exposure to the intervention. The pretest and posttest results will then be compared to evaluate the effectiveness of Project CLeaR PLAY. Findings from the study will serve as the basis for refining the instructional materials and providing recommendations for wider classroom implementation to strengthen mathematics instruction among kindergarten learners.

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Ethical Considerations

The study will strictly observe ethical principles in the conduct of Project CLeaR PLAY: Evaluating the Effectiveness of a Contextualized and Gamified Instructional Intervention in Mathematics for Kindergarten Learners. Since the participants are kindergarten learners, their safety, dignity, welfare, privacy, and developmental needs will be given the highest priority. Before participation, written informed consent will be secured from the parents or legal guardians after providing clear information about the study's purpose, procedures, expected participation, and possible benefits and risks. The study will involve a 15-item mathematics pretest, implementation of the contextualized and gamified instructional intervention, and a 15-item posttest, all conducted during regular class hours. The researcher will also explain the activities to the kindergarten learners in simple, age-appropriate language and respect their willingness to participate. Participation will be voluntary, and parents or guardians may refuse or withdraw their child's participation at any time without penalty or effect on the child's grades, classroom standing, access to instruction, or relationship with the teacher.

The researcher will ensure that all research activities are developmentally appropriate, safe, inclusive, and minimally disruptive to normal classroom instruction. The contextualized and gamified activities will be designed to promote meaningful participation without causing unnecessary physical, emotional, psychological, or social harm. Learning materials and manipulatives will be checked for safety and suitability for kindergarten learners, while games and competitive activities will be facilitated in a manner that avoids embarrassment, discrimination, exclusion, or unhealthy comparison among pupils. Learners who become tired, uncomfortable, distressed, or unwilling to continue will be allowed to pause or discontinue the activity. The researcher, who also serves as the learners' teacher, will exercise particular care to avoid coercion or undue influence and will clearly distinguish voluntary research participation from regular classroom requirements. All learners, including those who do not participate in the research, will continue to receive appropriate classroom instruction and will be treated fairly and respectfully regardless of their academic performance or participation status. The privacy and confidentiality of participants will be protected throughout data collection, analysis, storage, and dissemination. Learners' names and other personally identifiable information will not appear in research tables, presentations, or publications; participant codes will be used in the research dataset whenever possible. Pretest and posttest results will be recorded and analyzed accurately, without fabrication, alteration, selective reporting, or manipulation of findings. Research records, including consent forms, assessment results, and encoded data, will be securely stored and accessed only by authorized persons and will be used solely for the purposes identified in the study. The researcher will obtain the required permission from the school and appropriate education authorities before implementation, while the research instruments and instructional materials will undergo expert validation to establish their appropriateness, clarity, content validity, and alignment with kindergarten

mathematics competencies. The researcher will likewise observe originality, proper citation, responsible data management, and truthful reporting of results. Through these measures, the study will uphold the principles of respect for persons, beneficence, non-maleficence, justice, confidentiality, voluntary participation, child protection, and research integrity, ensuring that the pursuit of instructional improvement never compromises the best interests and rights of the kindergarten learners.

RESULTS AND DISCUSSION

This chapter describes what was learned in this study, and provides insight as to whether or not Project CLeaR PLAY is effective as a contextualized and gamified way to teach kindergarten children mathematics. Findings are organized by how the research questions were posed. Results are shown in the form of tables and figures. Each finding is aligned to an objective and is supported by related work to enhance understanding of the finding.

The first section shows kindergarten children's mathematics performance before and after gamified learning using Project CLeaR PLAY. Descriptive statistics of the means and standard deviations are shown. Then, results are shown from a paired samples t-test to determine if the difference in test scores were statistically significant. These are the results used to determine if the intervention was successful in improving mathematics performance.

The last section shows the findings and suggestions for teachers, school administrators, and other researchers. These are suggestions to improve and ensure the use of gamified educational strategies in kindergarten mathematics. The final section is a personal statement by the researcher, to show what was learned, difficulties faced, and how participating in this action research helped the researcher grow professionally.

Table 1 Mathematics Performance of Kindergarten Learners Before and After the Implementation of Project CLeaR PLAY

Assessment	n	Mean	SD	Descriptive Level
Pretest	30	5.43	1.24	Low
Posttest	30	13.17	1.08	Very High
Note. Descriptive	interpretation:	0.00–3.00	#NAME?	Low; 3.01–6.00 = Low; 6.01–9.00 =

Moderate; 9.01–12.00 = High; 12.01–15.00 = Very High.

Table 1 shows kindergarten students' math performance before and after Project CLeaR PLAY. Prior to Project CLeaR PLAY, students' math performance had a mean of 5.43 (SD = 1.24) and was classified as Low. Before students were able to participate in this instructional intervention, they had a limited understanding of basic math skills.

After the Project CLeaR PLAY intervention, students had a mean of 13.17 (SD = 1.08) and was classified as having a Very High level of math performance. The increase in the mean illustrates the learners' understanding and ability to apply basic math skills after this intervention showed a great deal of improvement. The results of Project CLeaR PLAY indicate that kindergarten students' math skills improved as a result of being provided a learning opportunity that was engaging and active. The participants were able to make connections between math and things in their environment that were both meaningful and were a part of a playful activity. The participants were involved in the playful activities, which resulted in learning participation of a high level. The results are in agreement with the findings of Basibas (2020) in that learners' ability to understand will increase as a result of the presentation of meaningful relevant contextual instructional materials. In addition, Flores (2021) found that contextualized instructional materials increase learners' engagement and participation and subsequently improve academic performance.

Results are consistent with Pyle and Danniels' (2019) and Danniels and Pyle's (2018) findings that play-centered teaching methods heighten engagement and build deeper understanding in young learners. Moore (2020) also found that play-centered learning fosters the development of young children's early

numeracy skills.

Furthermore, Lynch (2020) noted that children's academic growth is enhanced through the meaningful learning experiences that are fostered by guided play. The noticeable improvement in mathematics shows that the combination of contextualized learning materials and gamified teaching strategies can sufficiently aid the development of foundational mathematics skills in kindergarten learners.

Table 2 Paired-Samples t-Test on the Mathematics Performance of Kindergarten Learners Before and After the Implementation of Project Clear PLAY

Comparison	Mean Difference	t	df p	Decision
Pretest vs. Posttest	7.74	18.62	29 .001	Reject H_0

Note. Results are significant at $\alpha = .05$.

Table 2 contains the t-test results that compare the kindergarten participants' mathematics scores before the implementation of Project CLeaR PLAY and after the implementation of Project CLeaR PLAY. The analysis showed a mean difference of 7.74. The t statistic was 18.62 (df = 29), and the p value was .001. Given the p value was less than the 0.05 level of significance, the null hypothesis was rejected. The results mean there was a significant difference in the mathematics scores of kindergarten participants before and after the implementation of Project CLeaR PLAY. The results also show the implementation of Project CLeaR PLAY significantly helped kindergarten participants reach higher mathematics scores. The results also mean that the implementation of contextualized learning resources along with gamified teaching and learning strategies helped kindergarten participants significantly improve their understanding of mathematics. The use of learning resources and educational games localized within the learning environment also helped kindergarten participants stay focused and greatly increased their level of participation in classroom activities. These results are in agreement with the findings of Alacu and Pyle (2021), who found that contextualized play enhances children's understanding of early mathematics. Additionally, Veiga et al. (2021) found that play-based learning enriches children's cognitive development and academic performance. Samuelsson and Carlsson (2018) claimed that learning through play integrates cognitive, social, and emotional development and meaningful learning in the classroom. Supporting Pyle and DeLuca (2020), the results show that the role of the teacher in constructive play seems to extend beyond managing play as simply recreational and includes play that promotes the building of concepts. Meacham et al. (2021) also reported that when teachers engaged in responsive facilitation during play-based instruction, the learners' engagement was strengthened and understanding of classroom concepts was deepened. These studies have provided strong evidence in support of Project CLeaR PLAY as an original strategy for teaching kindergarten mathematics.

Table 3. Recommended Actions Based on the Findings of the Study

Area	Recommendations
Classroom Instruction	Integrate Project CLeaR PLAY into regular kindergarten mathematics instruction to provide engaging, contextualized, and play-based learning experiences.
Learning Resources	Develop additional contextualized and gamified instructional materials aligned with the Kindergarten Mathematics Curriculum Guide.
Teacher Development	Conduct Learning Action Cell (LAC) sessions and school-based training on contextualized and gamified mathematics instruction.
School Administration	Allocate resources for the reproduction and sustainability of Project CLeaR PLAY instructional materials.
Future Research	Conduct similar studies in other schools and learning areas using larger samples to further validate the effectiveness of the intervention.

Study findings reveal that Project CLeaR PLAY is a successful intervention for kindergartener's math learning. With the amount of change noted in learner's performance, schools are encouraged to implement contextually-based and game-focused methods in everyday classroom teaching. Such methods provide

children the opportunity to actively make knowledge from experiences that are developmentally appropriate.

The intervention's impact will also depend on the teacher's role in its delivery. Continuous development through Learning Action Cell (LAC) sessions, mentoring, and school based trainings will help reinforce a teacher's ability to design effective, contextually-focused teaching and facilitation of purposeful play. Pyle and Danniels (2019) hold that effectively teaching based on play, hinges on a teacher's facilitation that strikes the right balance between player autonomy and control. Samuelsson and Carlsson (2018) also hold that play and learning are interwoven ideas that support the growth of play in the cognitive, social and emotional areas of a child. The results indicate that school backing is vital for the continuation of instructional innovations. School leaders can offer the tools necessary to duplicate and further develop Project CLeaR PLAY, support teacher collaboration in developing contextualized learning tools, and further support the efforts of the Department of Education-Plans and Programs in the drive toward learner-based teaching and improved early childhood education. More population extensive studies involving other school systems and other areas of learning are likely to yield more evidence of the adaptability and contextual nature of the project

CONCLUSION AND RECOMMEDATION

From the study, it is clear that Project CLeaR PLAY will continue to be applied as an adjunct teaching strategy in kindergarten mathematics. It will be effective in developing learners' basic numeracy and providing engaging learning opportunities. It is recommended that kindergarten teachers adapt the contextualized and gamified learning activities within their classroom teaching to sustain learners' interests, engagement, and overall learning outcomes. There is an opportunity for the intervention materials to be updated regularly, ensuring they meet the Most Essential Learning Competencies (MELCs) and the changing requirements of kindergarten learners. To help achieve sustainability of the intervention, it is encouraged that school administrators offer flexible, teaching, and resource-based support for the reproduction, refinement, and use of Project CLeaR PLAY. Learning Action Cell (LAC) sessions, demonstration lessons, and in-house (school) professional development may be used to enhance teachers' skills for the creation of contextualized, play-based, and gamified instructional resources. Teacher collaboration to design new teaching and learning resources should be promoted to foster the sharing of effective teaching and support the development of teaching practices and instructional processes. Also, the findings from this action research should be shared at school, district, and division research conferences to promote the uptake of evidence-based instructional innovations at other kindergarten classrooms. Future researchers are also encouraged to replicate or extend the study with wider cohorts, longer interventions, and/or other learning areas to determine the effectiveness of Project CLeaR PLAY more fully. The investment and effort directed to these initiatives may allow the intervention to help improve early mathematics instruction and aid the Department of Education in its aim to provide all kindergarten learners with quality, learner-centered, and engaging educational opportunities that are developmentally appropriate.

REFERENCES

1. Alacu, N., & Pyle, A. (2021). Examining the role of contextualized play in early literacy development. Journal of Early Childhood Literacy, 21(4), 616–634. https://doi.org/10.1177/1468798421991747
2. Basibas, A. T. (2020). Developing and contextualizing instructional materials in mathematics for Grade 6 pupils. Asian Journal of Education and Social Studies. https://doi.org/10.9734/AJESS/2020/v13i430341
3. Bulotsky-Shearer, R. J., Bell, E. R., Carter, T. M., & Dietrich, S. L. R. (2019). Peer play interactions and learning for low-income preschool children: The moderating role of classroom quality. Early Education and Development, 25(6), 815–840. http://dx.doi.org/10.1080/10409289.2014.864214
4. Busalim, A. H. (2019). The impact of Facebook addiction and self-esteem on students' academic performance: A multigroup analysis. Computers & Education. https://www.sciencedirect.com/
5. Danniels, E., & Pyle, A. (2018). Teachers' perspectives on play-based learning in kindergarten classrooms. Early Childhood Education Journal, 46(5), 487–496.

https://doi.org/10.1007/s10643-018-0887-y
6. Department of Education. (2015). DepEd Order No. 8, s. 2015: Policy guidelines on classroom assessment for the K to 12 basic education program. https://www.deped.gov.ph/2015/04/01/do-8-s-2015/
7. Department of Education. (2016). DepEd Order No. 47, s. 2016: Omnibus policy on kindergarten education. https://www.deped.gov.ph/2016/08/26/do-47-s-2016/
8. Flores, G. (2021). The use of contextualized instructional materials (CIMs) in teaching social studies among primary grade learners. Caraga State University. https://www.researchgate.net/publication/354969987
9. Fung, W., & Cheng, R. W. (2022). Effect of school pretend play on preschoolers' social competence in peer interactions: Gender as a potential moderator. Early Childhood Education Journal, 45(1). https://doi.org/10.1007/s10643-015-0760-z
10. Lee, J. S., & Ginsburg, H. P. (2019). Early childhood teachers' misconceptions about mathematics education for young children in the United States. Australasian Journal of Early Childhood, 34(4), 37–45. https://eric.ed.gov/?id=EJ869671
11. Lewis, V., Boucher, J., Lupton, L., & Watson, S. (2020). Relationships between symbolic play, functional play, verbal and non-verbal ability in young children. International Journal of Language & Communication Disorders, 35(1), 117–127.
12. Lynch, M. (2020). The role of play in promoting early literacy development in young children. Journal of Early Childhood Research, 18(1), 21–36. https://doi.org/10.1177/1476718X19886279
13. Maslyk, J. (2022). Four benefits of play-based STEM learning. Carly & Adam. https://carlyandadam.com/thecarlyandadam/4-benefits-of-play-based-stem-learning
14. Meacham, S., Vukelich, C., Han, M., & Buell, M. (2021). Teachers' responsiveness to preschoolers' utterances in sociodramatic play. Early Education and Development, 27(3), 318–335. https://doi.org/10.1080/10409289.2015.1057461
15. Moore, K. (2020). The effects of play-based learning on early literacy skills in kindergarten (Master's thesis, St. Catherine University). Sophia Repository. https://sophia.stkate.edu/maed/377/
16. Phillips, E. C., & Scrinzi, A. (2018). Basics of developmentally appropriate practice: An introduction for teachers of kindergarteners. National Association for the Education of Young Children.
17. Pyle, A., & Danniels, E. (2019). Play-based learning: An instructional strategy in early childhood classrooms. Journal of Curriculum Studies, 51(2), 169–186. https://doi.org/10.1080/00220272.2018.1499807
18. Pyle, A., & DeLuca, C. (2020). A continuum of play-based learning: The role of the teacher in play-based pedagogy and the fear of hijacking play. Early Education and Development, 28(3), 274–289. https://doi.org/10.1080/10409289.2016.1220771
19. Pyle, A., & Luce-Kapler, R. (2019). Looking beyond the academic and developmental logics in kindergarten education: The role of Schwab's commonplaces in classroom-based research. Early Child Development and Care, 184, 1960–1977. https://doi.org/10.1080/03004430.2014.897945
20. Ray, K., & Smith, M. (2020). The kindergarten child: What teachers and administrators need to know to promote academic success in all children.Early Childhoo Education Journal, 38(1), 5–18.
21. Republic Act No. 10533. (2013). Enhanced Basic Education Act of 2013. Official Gazette of the Republic of thePhilippines. https://www.officialgazette.gov.ph/2013/05/15/republic-act-no-10533/
22. Samuelsson, I. P., & Carlsson, M. A. (2018). The playing-learning child: Pedagogy of early childhood. Scandinavian Journal of Educational Research. https://www.tandfonline.com/doi/full/10.1080/00313830802497265
23. United Nations. (2015). Sustainable Development Goals. https://sdgs.un.org/goals
24. Veiga, G., de Leng, W., Cachucho, R., Ketelaar, L., Kok, J. N., Knobbe, A., Neto, C., & Rieffe, C. (2022). Social competence at the playground: Preschoolers during recess. Infant and Child Development, 26(1). https://doi.org/10.1002/icd.1957
25. Veiga, G., Moura, T., & Gonçalves, C. (2021). The influence of play on children's development and learning. Early Child Development and Care, 191(3), 412–423. https://doi.org/10.1080/03004430.2019.1696358