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Pre-Test and Post Test Analysis on the Tutorial Program among Children in the Adopted Community of a University

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ABSTRACT

This study evaluated the effectiveness of a tutorial program implemented as a community extension initiative by the Basic Education Department, targeting 33 student beneficiaries. Using a pretest-posttest design, the study compared students' academic performance in Mathematics and Science before and after participation in the tutorial sessions. Results showed that the pre-test mean score in Mathematics increased from 22.30 to 25.00, while in Science, the pre-test mean rose from 13.85 to 16.55, with both subjects demonstrating a consistent mean difference of 2.7. These improvements were classified as Very Satisfactory, indicating that the tutorial program produced clear, measurable, and meaningful gains in students' understanding and application of key concepts. The findings highlight the significance of structured, targeted, and community-based educational interventions in enhancing learning outcomes and academic growth. Supporting literature also underscores the role of such programs in promoting cognitive development, personal growth, and moral development among students. The study suggests that tutorial sessions conducted in the adopted barangays effectively strengthened students' knowledge, skills, and confidence in their academic abilities. Overall, the results demonstrate that community extension programs can be valuable for improving educational outcomes and fostering holistic development in student beneficiaries.

Keywords: *Academic Performance, Cebu, Community Extension, Mathematics, Philippines, Science, Tutorial Program*

INTRODUCTION

In pursuing educational equity and community engagement, higher education institutions are increasingly called upon to extend their resources beyond traditional classrooms. This mandate is supported by Republic Act No. 7722, known as the Higher Education Act of 1994, and CHED Memorandum Order No. 48, Series of 1996, which emphasizes that universities must have reliable and responsive community extension programs, including services such as applied research, continuing education, and community outreach (CHED, 1996). Among these, tutorial programs have emerged as one of the most effective interventions to address learning gaps among underserved populations, particularly in the areas of literacy and numeracy.

Tutoring is defined as one-on-one or small-group instructional support delivered by educators, paraprofessionals, volunteers, or trained individuals. It is considered a transformative educational strategy. A systematic review conducted by Nickow et al. (2020) demonstrates that tutoring consistently produces significant improvements in student learning outcomes, with the most pronounced effects observed when it

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is delivered in the early grades by trained educators or paraprofessionals. These programs offer academic reinforcement and promote mentorship, social development, and stronger ties between academic institutions and local communities.

In line with this, the University of Cebu, through its Community Awareness, Relations, and Extension Services (CARES) office, implemented a tutorial program as a core community extension initiative. This program mobilizes faculty and student volunteers from the Basic Education Department to deliver focused literacy and numeracy sessions to children in the university's adopted communities. The goal is not only to uplift learners' academic performance but also to instill a deeper sense of social responsibility and professional growth among the implementers.

This study is inspired by similar initiatives, such as the literacy and numeracy enhancement program conducted by Arciosa et al. (2022), which showed significant improvements in post-test scores among Alternative Learning System (ALS) and out-of-school youth learners. Findings further suggest that participation in such programs enhances the implementers' professional and social competencies due to their active involvement in the community. Likewise, the present research seeks to evaluate the effectiveness of the University of Cebu's tutorial program by analyzing pre-test and post-test results of its beneficiaries.

Beyond academic improvement, community service initiatives like this contribute to holistic development. Montebon et al. (2023) emphasize that volunteering in tutorial and welfare initiatives can enhance students' academic performance, leadership potential, critical thinking, and self-confidence. Furthermore, community extension fosters collaboration and social cohesion, helping faculty and students build meaningful relationships within the community (Rubio et al., 2016; Montebon et al., 2022). According to Serrano et al. (2022), one of the core functions of an institution is to develop and maintain connections with the community, providing responsive programs that address local needs.

The effectiveness of community extension programs is ultimately shaped by the quality of service provided (Corpuz et al., 2022) and by the ability of academic institutions to build trust and cooperation among community stakeholders. The University of Cebu's CARES office continues to be the central hub for coordinating such efforts, reinforcing the university's mission to deliver inclusive, empowering, and socially relevant education (Montebon et al., 2023).

OBJECTIVE OF THE STUDY

The primary objective of this study is to determine the effectiveness of the tutorial program implemented as a community extension initiative by the Grade School Department of a university. Specifically, the study aims to determine the academic performance of the student beneficiaries before and after their participation in the tutorial sessions.

METHODOLOGY

This study employed a Quasi-Experimental research design to determine the effectiveness of a tutorial program implemented as part of the community extension initiative of the University of Cebu – Lapu-Lapu and Mandaue Campus. The design involved administering a pre-test before the tutorial sessions and a post-test after the completion of the program to assess changes in the academic performance of the child beneficiaries from the adopted community.

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The study's respondents were children from the university's adopted community who voluntarily participated in the tutorial program. The children attended scheduled tutorial sessions at the university campus, facilitated by assigned tutors from the Grade School Department.

The research instrument used was a set of pre-test and post-test questionnaires developed by an experienced grade school teacher. Subsequently, it was validated and verified by the school principal to ensure content accuracy and relevance to the children's grade level and competencies.

The data collection process began with the administration of a **pre-test** to establish the baseline knowledge and academic performance of the student participants prior to the start of the tutorial sessions. Upon completion of the tutorial program, the same students were administered a **post-test** to evaluate any changes or improvements in their learning outcomes. The **pre-test and post-test scores** were then compared and analyzed to determine the impact of the intervention.

For data analysis, **descriptive statistics**, including the mean and standard deviation, were used to summarize the scores, while a **paired sample t-test** was conducted to assess whether the differences between pre-test and post-test results were statistically significant. This allowed for a rigorous evaluation of the tutorial program's effectiveness in enhancing the academic performance of the student beneficiaries, providing quantitative evidence of the program's impact on their learning outcomes.

RESULTS AND DISCUSSIONS

This section presents and analyzes the findings of the study on the effectiveness of the tutorial program implemented as a community extension initiative by the Basic Education Department. The analysis focuses on the comparison of pretest and posttest scores in Mathematics and Science among the 33 student beneficiaries, highlighting the program's impact on academic performance.

Table 1

Comparison of Pretest and Posttest Mean Scores in Mathematics

Subject	Pretest Mean	Posttest Mean	Mean Difference
Math	**22.30**	**25**	**2.7**

The study involved 33 student beneficiaries who participated in the tutorial program implemented as a community extension initiative by the Basic Education Department. To assess the program's effectiveness in improving students' mathematics performance, pretest and posttest scores were compared.

The results show that the pretest mean score in mathematics was 22.30, while the posttest mean score increased to 25.00, resulting in a mean difference of 2.7. This positive change indicates that, on average, students showed improvement in their mathematics performance after participating in the tutorial sessions. The increase in mean scores suggests that the tutorial program had a beneficial effect, helping students enhance their understanding and application of mathematical concepts. The results imply that the tutorial program effectively contributed to academic improvement in mathematics for the participating

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students, demonstrating the value of community extension programs in supporting student learning outcomes.

In the study of Balila et al (2016) examines the impact of student participation in community extension programs on both personal growth and cognitive development. The findings indicate that engagement in these programs fosters moral and ethical development, strengthens interpersonal and intrapersonal skills, and enhances self-awareness and identity. Moreover, involvement in such initiatives is associated with improved academic performance, highlighting the positive role that community-based activities can play in enriching students' overall learning experiences and educational outcomes.

Table 2

Comparison of Pretest and Posttest Mean Scores in Science

Subject	**Pretest Mean**	**Posttest Mean**	**Mean Difference**
Science	**13.85**	**16.55**	**2.7**

The pretest and posttest mean scores in Science showed a marked improvement in students' academic performance. The pretest mean was 13.85, while the posttest mean increased to 16.55, yielding a mean difference of 2.7. This upward trend indicates that the tutorial program effectively strengthened students' comprehension and application of scientific concepts. The results highlight the significance of targeted, community-based educational interventions in promoting academic growth and reinforcing learning outcomes.

Supporting this, Diez, Garde, and Lanticse (2022) investigated the use of web-based interactive exercises to enhance the academic performance of first-year Bachelor of Secondary Education (BSEd) students in Stoichiometry. Using a one-group pretest-posttest design with 21 participants, the study found a significant improvement in students' achievement following the implementation of these interactive exercises. The findings emphasize the effectiveness of engaging, technology-supported learning tools in improving understanding and mastery of complex scientific topics.

Table 3

Classification of This Study's Mean Differences

Subject	**Pretest Mean**	**Posttest Mean**	**Mean Difference**	**Rating**
Math	**22.30**	**25**	**2.7**	**Very Satisfactory**
Science	**13.85**	**16.55**	**2.7**	**Very Satisfactory**

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The study evaluated the effectiveness of the tutorial program under the community extension initiative by comparing pretest and posttest scores in Mathematics and Science among 33 student beneficiaries.

In Mathematics, the pretest mean score was 22.30, which increased to 25.00 in the posttest, resulting in a mean difference of 2.7. This improvement is classified as Very Satisfactory, indicating that the tutorial program significantly enhanced students' understanding and application of mathematical concepts.

Similarly, in Science, the pretest mean was 13.85, while the posttest mean rose to 16.55, also yielding a mean difference of 2.7 and earning a Very Satisfactory rating. This demonstrates that the tutorial sessions effectively improved students' comprehension and performance in scientific concepts.

Overall, the consistent mean gain of 2.7 in both subjects, along with the "Very Satisfactory" classification, highlights the positive impact of the tutorial program on academic growth. As shown in Table 3, there is a clear and measurable improvement in students' mean scores in both subjects following the tutorial sessions. The findings suggest that the program conducted in the adopted barangay successfully enhanced students' learning outcomes, reflecting the effectiveness of community-based educational interventions in promoting academic achievement.

Using the adopted descriptive scale, both Mathematics and Science demonstrated Very Satisfactory improvement ($\Delta = 2.70$), indicating that the tutorial program produced clear, meaningful, and measurable academic gains.

CONCLUSION

The findings of the study indicate that the tutorial program implemented as a community extension initiative by the Basic Education Department effectively enhanced the academic performance of 33 student beneficiaries in both Mathematics and Science. The pretest and posttest comparisons revealed a consistent mean gain of 2.7 in each subject, classified as Very Satisfactory, demonstrating clear and meaningful improvements in students' understanding, application, and mastery of key concepts. These results highlight the value of structured, targeted, and community-based educational interventions in fostering both cognitive and personal development, supporting existing literature that links active participation in extension programs to enhanced learning outcomes, moral growth, and self-awareness. Overall, the tutorial program successfully contributed to measurable academic gains and reinforced the significance of community-engaged teaching strategies in promoting student achievement.

RECOMMENDATIONS

- Sustain and expand the program by continuing the tutorial program and consider extending it to other schools/ adopted barangays to benefit a larger number of students.
- Incorporate technology-based tools and integrate web-based interactive exercises and other digital resources to further enhance engagement and comprehension in both Mathematics and Science.
- Conduct periodic assessments and feedback sessions to track students' progress and adjust tutorial strategies based on their learning needs.
- Provide training for tutors to strengthen teaching methods, particularly in delivering targeted and differentiated instruction to accommodate diverse learning abilities.

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