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Supplementation Matters

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Supplementation Matters: Academic Impact of an Afterschool Tutoring Program in Timor-Leste

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Abstract Students in Timor-Leste face low educational outcomes due to sociopolitical factors rooted in the nation's colonial history. This study evaluates the academic impact of a low-resource afterschool supplementary tutoring program designed to address learning gaps and improve school outcomes across rural and urban settings. Using instructional design principles, the program employed worksheet-based individualized learning content in a familiar language, supported by personalized feedback. Pre- and post-test scores in mathematics and English were compared over 7 months between an intervention group and a comparison group, with results analyzed using a Welch *t* test. Findings revealed statistically significant improvements in both subjects, with greater gains in mathematics, suggesting an opportunity to explore alternative methods for English instruction, such as incorporating social interactions to support early learners. The study highlights the importance of community support, tutors' capabilities, and their residence within local neighborhoods in sustaining the program. These results demonstrate the potential of well-structured afterschool programs to enhance educational outcomes in low-resource contexts, offering a scalable model for similar initiatives in emerging nations.

Keywords Timor-Leste · Tutoring · Supplementary education · Worksheets · Instructional design

Introduction

In least-developed economies, educational outcomes are hindered by systemic challenges, including limited resources, poor school facilities, frequent teacher absenteeism, diverse learning needs in large classrooms, inadequate access to textbooks, and excessive time spent copying text (Abadzi, 2004; O'Sullivan, 2022; UNESCO Institute for Statistics, 2012). These barriers are further compounded by the widespread use of unfamiliar languages of instruction (Hamam, 2021). Such challenges lead to knowledge gaps that persist and accumulate over time. Inefficient learning in turn results in the perpetuation of the cycle of poverty (Abadzi, 2004). Addressing knowledge gaps is, therefore, critical, as they undermine students' ability to progress academically and economically.

While technology-supported personalized learning and one-on-one tuition have shown promise in addressing learning gaps for disadvantaged students (Dumenden, 2011; Major et al., 2021), these approaches remain largely unaffordable in resource-poor countries. Homework clubs provide a more affordable approach to improve academic performance in low-resource settings (Hall et al., 2010; Tansey & Gallo, 2018; Tolbert & Maxson, 2015). However, these programs often fail to systematically address individual learning gaps. There is a need to explore cost-effective strategies that systematically target knowledge gaps in low-resource settings, particularly in contexts where poverty and linguistic diversity further complicate educational outcomes.

Timor-Leste exemplifies such a setting. Despite modest improvements in educational outcomes since gaining independence in 2002, systemic factors such as limited resources and linguistic diversity continue to contribute to significant knowledge gaps (UNICEF, 2022; The World Bank Group & Timor-Leste Ministry of Finance, 2021). The 2011–2030

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Timor-Leste Strategic Development Plan highlights the need for a multi-sector approach to address the nation's educational challenges, recognizing that schools alone cannot meet the diverse and pressing needs of students (Democratic Republic of Timor-Leste, 2011). In this context, community-led or private afterschool programs present a complementary strategy within a multi-sector framework. These programs have proven effective in complementing school education by enhancing academic outcomes in other low-income settings (Dongre & Tewary, 2015; Fakhri et al., 2022; Halter, 2020; Tolbert & Maxson, 2015). However, there is limited evidence on their effectiveness in Timor-Leste's unique socio-linguistic context.

This study investigates the impact of a low-resource individualized remedial afterschool tuition program in Timor-Leste, delivered in the Tetum language to systematically address knowledge gaps. The program, designed for 10- to 15-year-olds in rural and urban settings, supplements school education by focusing on English and mathematics through instructional design principles. It uses worksheets tailored to the zone of proximal development (Vygotsky, 1986) and incorporates complementary activities, such as arts, crafts, games, and computer basics. The research is guided by the question: *How effective is a worksheet-based individualized remedial tuition program in a familiar language (Tetum) at improving Timorese adolescents' academic performance?* The study measures the effectiveness of the program in mathematics acquisition (Connor et al., 2018) and evaluates the impact of vocabulary exercises for learners of English as an alternative language (Oxley & de Cat, 2021; Dixon et al., 2020) compared to a comparison group using *t* test statistics. To the best of the author's knowledge, this is the first study of an afterschool intervention program in Timor-Leste and the first application of instructional design for using tailored worksheets for school students in a low-resource context of the Global South.

Context and Literature Review

Timor-Leste is situated in the southeastern border of Indonesia with a population of 1.3 million (Timor-Leste National Institute of Statistics, 2022). Timor-Leste's low economic standing (World Bank, 2022) and high ratio of school-aged students (Timor-Leste National Institute of Statistics, 2022) have implications for its education system. An average of 57:1 student-to-teacher ratio (The World Bank Group & Timor-Leste Ministry of Finance, 2021) compels teachers to adopt a teacher-centered authoritarian approach (Quinn, 2013). Instruction time is limited (Timor-Leste Ministry of Education, 2014), and material and human resources are constrained (General Directorate of Statistics, 2021) with an evident impact on academic outcomes (Silva et al., 2011;

UNICEF, 2022). Supplementary tutoring can serve as one approach to enhance and reinforce school instruction.

Supplementary education refers to instruction provided to school students outside regular school hours to support their learning (OECD, 2014). Such programs vary in format, including online or in-person, one-on-one or group settings, and differ in frequency, pedagogy, and formality. Often focusing on academics, these programs frequently align with school curricula and may involve fees, as seen with private tutoring (Bray, 2017). Families typically seek tutoring for academic remediation when students struggle to meet curriculum expectations, with low-income families benefiting the most (Dang & Rogers, 2008; Dongre & Tewary, 2015; World Bank, 2018). Effective remediation targets individual student needs and allows self-paced learning (Hattie, 2009). While one-on-one tutoring is ideal to achieve this, other models are more feasible in low-resource contexts. Instructional design offers a suitable framework for self-paced, targeted learning (Bertrand, 2003).

Instructional design is a structured educational approach that aligns learning content with student needs through regular evaluation (Isman, 2011). Bertrand (2003) describes the process as starting with predefined learning objectives, followed by a pedagogical plan to achieve them. Student performance is periodically monitored, and objectives are advanced as progress is made. While commonly implemented through eLearning to enable individualized content (Amatya, 2022; Burgos, 2020; Wu, 2019), alternative approaches are necessary in low-resource contexts lacking access to technology.

A notable program employing instructional design via worksheets for self-learning without technology is Kumon (2023). Ukai (1994) describes Kumon as building mastery through drill exercises, appealing to Eastern parents. It assesses students' abilities with entry tests and assigns individualized worksheets. Students meet tutors weekly and complete exercises at home with parental help. Despite criticism of its behaviorist paradigm (Hour, 2011; Ransom & Manning, 2013), studies highlight its effectiveness in improving academic skills (Ashraf, 2018; Oakley et al., 2003; Orcos et al., 2019; Weischadle, 2002). However, its application in low-resource contexts must account for the cost of printed worksheets and the lack of academically capable adults to assist students at home.

Program Design

This paper examines the academic effectiveness of the Enlight program, a low-resource model using differentiated worksheets to address student knowledge gaps. The program applies a leveled instructional design structure (Pappas, 2014) to tackle significant learning gaps in the unique

context of Timor-Leste (Silva et al., 2011). The program departs from traditional pedagogies by introducing teacher-guided learning in small groups, facilitated by a tutor. Content in the program's core subjects, mathematics, and English, is individualized through worksheets based on an entry test. The program includes additional subjects such as science, humanities, and computer basics. Other activities including jigsaw puzzles, Sudoku, chess, and simple art are incorporated into the structured curriculum. Holding three sessions each week for two hours helps foster a sense of belonging and reaffirms group identity. The Enlight program attempts to reduce inequality gaps at times attributed to private tutoring programs (Dang & Rogers, 2008) by offering the program in rural and urban settings and catering to diverse needs by individualizing content, pace of learning, assistance, and feedback for each participant.

An important design consideration in the program is the language of instruction. Hamam (2021) presents alarming statistics that more than ninety percent of students who learn in an unfamiliar language of instruction fail to develop basic literacy and numeracy. Tetum is the most widely spoken language in Timor-Leste, with 63% of the population being proficient in it (General Directorate of Statistics, 2015) and it enables greater student engagement in classrooms (Wacana & Salatiga, 2022). It is, therefore, adopted by the Enlight program.

The program keeps costs low by sponsoring tutors with secondary school completion as their highest formal qualification. Carefully designed worksheets prioritize quality over quantity, and students contribute USD 0.50 per week to cover printing costs.

Methodology

This investigation employed a quasi-experimental design to quantitatively assess the impact of the intervention. The study involved pre- and post-tests administered to both an intervention group, which received the intervention, and a comparison group, which did not. The analysis focused on measuring the differences in outcomes between the two groups to determine the effectiveness of the program. Ethical approval for the investigation was granted by the Timor-Leste National Institute for Science and Technology.

Participants

Participants in this study comprised two groups: an intervention group consisting of program participants and a comparison group comprising non-attendees. Participants in both groups were male and female Timorese middle- and working-class school students were aged 10–15. The intervention group included participants from five districts in nine classes

comprising three groups in an urban setting, four in regional, and two in rural. Through saturated sampling, 247 consenting students of the Enlight program participated in pre-tests and 126 of these with 40% or higher attendance participated in the full duration of the study. All 126 students participated in pre- and post-mathematics tests; however, only 110 participated in post English tests. The two tests were conducted approximately 6.8 months apart in 2023. The comparison group consisted of 143 consenting school students of the same age group who participated in the pre-tests. However, only 39 of these participated in post-tests which took place after approximately 7.4 months. The comparison group represented students from three schools in one urban center and two regional areas. School administrators in each of the three schools were requested to select two students from each class whose first names began with the letter A as a way of randomizing the selection. However, in two of the three schools, this condition was not strictly adhered.

Instruments

Competency tests consisted of one pre-test and one post-test, each assessing advances in mathematics ability and basic English proficiency. The tests were developed through multiple rounds of field testing conducted with students who were not participants in the study. The mathematics tests included 62 short-response questions. Each question assessed a different criterion aligned with Cycle 1 and parts of Cycle 2 of the national curriculum, covering grades 1 to 4 of primary school (Timor-Leste Ministry of Education, 2014). The rationale for covering early primary content was to identify and address learning gaps in the middle-school students. Tests had a maximum score of 75 marks. Basic English abilities were assessed on knowledge of simple vocabulary, sentence construction, and reading comprehension. This part of the tests included 30 questions with a maximum score of 50 marks. The types of questions in the pre-test and post-test were identical, but values were changed to eliminate the learning effect. The intervention and comparison groups received identical tests.

Variables

The intervention and comparison groups were treated as the independent variable, whereas the mean change in test scores from pre- to post-tests over a 7-month period, along with student attendance in sessions, were the dependent variables. Quantitative data were collected using a pre-test–post-test comparison-group observational design (Creswell, 2021) and tutors' attendance records. Tests were conducted under controlled conditions and the results were withheld from students. Students were allocated 2 h to complete the pre- and post-tests, with the majority finishing before the

allotted time expired. Students were not permitted to use technological aids.

The intervention group participated in the Enlight program, implemented in nine localities by nine tutors. All tutors had demonstrated mathematics competency above an 80% threshold at a grade four level, and were able to hold basic English conversations. Two tutors (*Urban 2* and *3*) were concurrently pursuing university studies, while the others had received varying levels of informal post-secondary training through short courses. Six tutors, who were acquaintances of the researcher, underwent 6 months of training that included studying program materials across all subjects, conducting science experiments, learning chess, and participating in art workshops. They also completed an English training module provided by the Achieve Higher Human Ability (AHHA) program. The remaining three tutors (*Regional 3, 4* and *Urban 2*), recruited through social media, received a month of similar training, including guidance on class establishment. Tutors' competencies in mathematics and English varied, with those in *Urban 3* and *Regional 1* exhibiting stronger skills in mathematics and those in *Regional 3* and *4* speaking English with fluency. The other tutors demonstrated comparable skills in both subjects. Tutor training for all tutors is ongoing and is offered through a weekend workshop once each month.

The program offered remedial and individualized tuition at the neighborhood level. All classes bar two (*Urban 1* and *Rural 2*) were held in the local vicinity of the tutors, often at a residential home in groups ranging from 5 to 15 students. Some groups met on school grounds and had access to a classroom. Tutors met monthly at a centralized location for a training workshop, to reflect on their work, plan for the month ahead, and collect new material for their students. Tutors used individualized worksheets to facilitate mathematics and English vocabulary acquisition. Tutors routinely marked student work and provided feedback. Tutors instructed students one-on-one, in pairs or small groups and occasionally as an entire group.

Data Analysis

Change in test scores from pre- to post-tests of the intervention group was compared statistically to that of the comparison group. The study tested the null hypothesis that there would be no significant difference between the two groups. A one-tailed alternative hypothesis stated that the program results in academic gains. Due to a difference in sample size and variance of the datasets, a Welch unequal variance t test (Welch, 1947) was carried out using Microsoft Excel (2016). Student test results for the intervention and comparison groups in mathematics and English were normally distributed as indicated on quantile–quantile plots (Clay Ford, 2015) and this satisfied the prerequisite for the

t test. A descriptive analysis examined the mean changes in test scores and their variability for both the intervention and comparison groups. It also calculated the 99.5% confidence interval, which indicates the range within which we can be 99.5% confident that the true difference between the group means lies, and the effect size, which measures the magnitude of the difference between the groups. In addition, student attendance records were used to calculate retention rate and average attendance for each group.

Limitations of the Research Design

Several factors may have confounded the results of this study. Attendance disruptions due to environmental factors (e.g., heavy rains, seasonal agricultural activities, and church-related commitments) likely affected students' consistent participation in the intervention. This may have disproportionately impacted groups in rural settings, potentially underrepresenting the program's effect on students with sporadic attendance. To account for this, outcomes were additionally measured in relation to participation to isolate the influence of the program on academic attainment.

In the intervention group, many students who initially participated in the pre-test did not complete the program. If academic affinity influenced their commitment, this creates a small bias toward more academically inclined students in the intervention group compared to the comparison group. Indeed, those who remained had marginally higher pre-test scores (mean: 28 vs. 25 out of 75 marks). While this distinction was not statistically significant, it may have influenced the outcomes.

Sample biases were another potential confounder. Deviations from the intended random selection process in the comparison group and a high dropout rate in both groups may have affected dataset comparability. To mitigate this, propensity score matching (Rosenbaum & Rubin, 1983) was used to create comparable subsets, retaining 87 intervention and 31 comparison group participants. A paired t test on these subsets supported the findings on the program's impact while minimizing selection bias.

Results and Discussion

Pre-tests

Among students who completed both pre-tests and post-tests, mathematics and English pre-test scores of the nine intervention groups were compared to the comparison group to establish the baseline before program implementation. For mathematics, none of the intervention groups performed statistically better than the comparison group; three groups performed significantly worse. For English, only one group

outperformed the comparison group, while three underperformed significantly. Median mathematics pre-test scores across all groups (nine intervention and one comparison) ranged from 6 to 22 out of 75 marks, indicating relative homogeneity. Median English scores ranged from 1 to 24 out of 50.

Pre-test and Post-test Comparison

After approximately 7 months of participation in the intervention program, the mean change in pre- and post-test scores for each student in both mathematics and English showed significant improvement compared to the comparison group. Descriptive analysis of the two datasets is displayed in Table 1. From this dataset, we can see that the mean score of both groups increased for both subjects as expected from school experience. However, the change in score was more significant for the intervention group.

A Welch *t* test (Welch, 1947) was carried out for the same datasets using a one-tailed alpha value of 0.005 to quantify the difference between the means for each subject. The results are summarized in Table 2. Considering that the absolute value of the *t*-statistic is greater than the *t* critical value for mathematics and English test comparisons (i.e., $7.28 > 2.62$ and $2.95 > 0.002$ respectively), the null hypothesis is rejected and it can be concluded that the tutoring program resulted in statistically significant academic gains for students in the Enlight program in mathematics and English subjects. The confidence interval for a one-tailed analysis of the difference in the two mean values of change in scores was subsequently calculated, indicating with 99.5% confidence that the difference of the two means for both subjects is greater than nil and more than five points above zero for mathematics. The effect

size was calculated using Cohen's *d* for Welch test formula (Cohen, 2013) as indicated in Table 2.

A paired *t* test was conducted on the differences between post-test scores for pairs of students (one from the intervention group and one from the comparison group) matched based on their pre-test outcomes using propensity score matching. The analysis revealed a mean difference favoring intervention participants of 11 points (from a baseline of 75) in mathematics and 5 points (from a baseline of 50) in English, with results indicating statistical significance ($p < 0.05$). These findings provide additional evidence that the intervention program positively impacted students' academic learning, while factoring for selection bias.

Group-by-Group Analysis

Mean changes in mathematics and English scores are plotted in Figs. 1 and 2, respectively, for each intervention group (which corresponds to a unique locality). Error bars indicate the 95% confidence interval. Academic gains in mathematics are evidently more pronounced than advances in English for students of the Enlight program.

In the plot for mathematics scores (Fig. 1), while the mean change in score for each class in the intervention group is greater than the mean change in score for the comparison group, only five groups display this difference with statistical significance. In the English plot, only four groups have a change in score which is statistically greater than the comparison group. Noticeably, the five groups with the largest growth in mathematics also had the largest growth in English achievement.

Table 1 Change in test scores between pre- and post-tests

Variable	Mathematics		English	
	Comparison group (<i>n</i> = 39)	Intervention group (<i>n</i> = 164)	Comparison group (<i>n</i> = 39)	Intervention group (<i>n</i> = 110)
Mean change in scores (from 75 marks)	1	9.25	0.95	3.68
Standard error	0.83	0.77	0.62	0.69
Median	1.00	9.00	1.00	4.00

Table 2 Summary of Welch *t* test statistic for pre- and post-test change

Subject area	Difference in means	T-statistic	Degrees of freedom	T critical value (one-tailed alpha = 0.005)	99.5% confidence interval of the difference in means	Effect size	Null hypothesis (H_0)
Mathematics	8.25	7.28	114	2.62	(5.29, ∞)	1.04	Rejected
English	2.73	2.95	125	0.002	(0.31, ∞)	0.47	Rejected

Attendance Rate and Outcomes

and attendance rate (from a total of 77 sessions) in *Rural 2* and *Urban 1*, as well as low attendance rate in *Regional 2* coincide with low advances in English and mathematics. A

Table 3 shows that low retention (during seven months)

Fig. 1 Mean change in pre- and post-test mathematics scores for intervention groups and comparison group

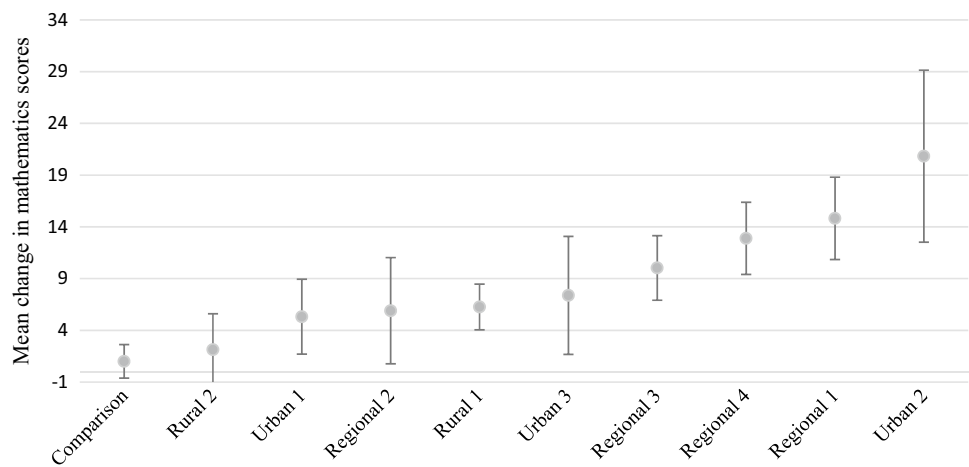


Fig. 2 Mean change in pre- and post-test English scores for intervention groups and comparison group

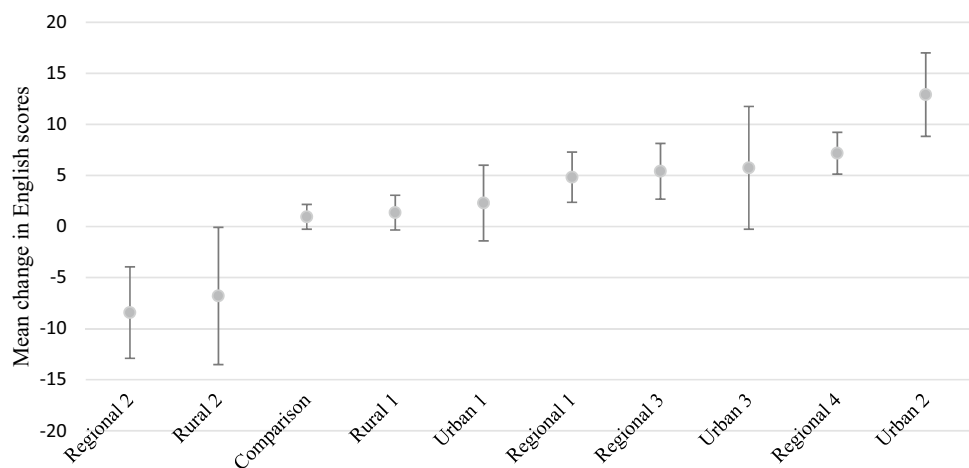


Table 3 Retention rate and average attendance for students who completed pre- and post-tests displayed in relation to each group

Group	Retention rate (%)	Average attendance (%)	Mean change in English scores	Mean change in mathematics scores
Urban 3	100	78	5.8	7.4
Regional 1	47	73	4.83	14.8
Rural 1	67	71	1.36	6.3
Regional 3	53	66	5.4	10
Regional 4	42	62	7.2	12.9
Urban 2	46	52	12.9	20.8
Regional 2	52	45	-8.4	5.9
Urban 1	18	43	2.3	5.3
Rural 2	16	78	-6.8	2.1
Mean	49	45	2.5 ^a	8.7 ^a
Comparison group	N/A	N/A	0.95	1.0

^aNote these values differ from earlier findings because group sizes differ

distinction is, therefore, evident across groups, with some performing well in both subjects and others underperforming in academic performance, attendance, and retention metrics. This difference is not due to urbanity of the groups.

Figure 3 shows a moderate relationship between the frequency of participation in the program and improvement in mathematics test scores, with a coefficient of determination of 0.3. A low coefficient of determination suggests that participation in the learning program is only one of many factors influencing students' test grades. Other variables such as individual difference in ability, study habits, home life and motivation may also play significant roles (Kumari & Chamundeswari, 2015; Schneider et al., 2010). While a low retention rate may partly explain the low outcomes, other factors such as session quality, community circumstances, or tutor efficacy may contribute to low retention.

Rural 2 and *Urban 1* had the lowest retention rate, the lowest attendance rate, the lowest growth in mathematics, and low English outcomes. A shared characteristic between these two groups was that the tutors were not original inhabitants of the class location, and both traveled to their classes from other neighborhoods. The tutor from *Urban 1* had migrated to the capital city (Dili) from a rural area, and therefore had a less natural connection with her students and their families. The idea of a *rural person* teaching *city children* was attested by at least one parent in the researcher's presence. This suggests that tutors are most effective within their own communities, where long-standing relationships, family connections, and rapport with neighbors already exist. Future research can verify this.

Reflecting on the tutors involved in the top five performing groups (*Urban 2*, *Regional 4*, *Urban 3*, *Regional 3*, and *Regional 1*), four had at some stage pursued studies at the tertiary level. Only one of the other four tutors had also pursued tertiary education, albeit with interruptions due to

Covid-19 measures. This suggests a possibility that results depend on tutor training. In a qualitative study, Rushforth (2011) found that students perceive tutor efficacy to be linked to the tutor's knowledge base, rapport, and patience with students. Training programs for tutors should, therefore, be ongoing.

A reflection on the 100% retention rate and the highest attendance metric in *Urban 3* suggests that a strong community support can be effective in maintaining these programs. The group in *Urban 3* was formed through the strong backing of a local mother who rallied the support of her neighbors, and through several conversations with her neighbors generated a consensus on the vision of the program with the tutor's help. While other tutors attempted to adopt a similar approach in their localities, this was the only group initiated by a mother rather than by the tutor and indicated a genuine desire on her part. There was a similar experience in *Rural 2* in which the chief of the village appreciated the vision of the program conveyed through a conversation, met with neighboring parents in several meetings to convey the same vision, offered his home as a venue, and ensured the longevity of the group while the same tutor was not able to sustain two other groups in other neighborhoods beyond 2 months. These findings about the importance of engaging families, the community, and key supporters for educational initiatives resonate with the findings of Finn-Stevenson (2014), who additionally provide strategies to strengthen these relationships.

English Acquisition

Two groups, specifically *Regional 2* and *Rural 2*, displayed negative growth for English acquisition, which is an unlikely occurrence for all participants. Disruptions to routine meetings of these two groups during pre-tests may

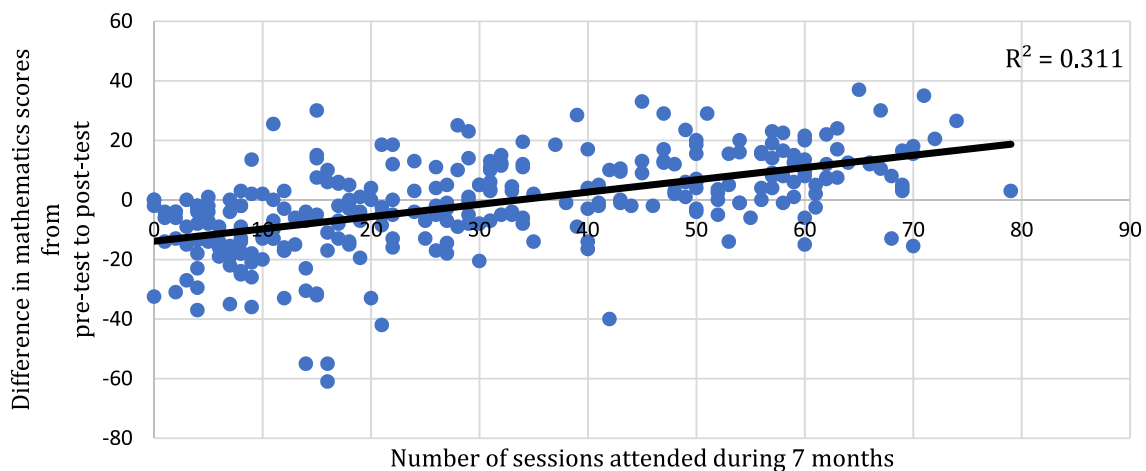


Fig. 3 Growth in mathematics score against attendance

have inadvertently led to inflated initial scores, possibly due to increased tutor involvement during testing, which in some cases took place one-on-one. Regardless, low English outcomes across all groups can be attributed to contextual challenges. Limited fluency among most tutors shifted activities toward paper-based tasks, while unclear pronunciations and the absence of technology for audio integration further restricted the use of audio instruction. Moreover, the lack of an immersive English-speaking environment meant that for many students, program sessions were their only exposure to the language. This restricted opportunities for contextual learning and repeated practice, both of which are crucial for vocabulary retention and fluency development (Ghazi-Saidi & Ansaldo, 2017; Landowski, 2023). Furthermore, from a sociocultural lens (Vygotsky, 1986), language learning should incorporate social and meaningful interactions, particularly for beginners (see also, Zahro et al., 2022; Krashen, 1992).

Scalability

While this study demonstrated positive outcomes of the intervention program, its scalability requires careful consideration. The primary expense was tutor wages (USD 150/month). With student fees often paid intermittently or incompletely, the program is unlikely to operate independently without external funding, making proportional expenses a critical factor in scalability. More significantly, the recruitment, training, and retention of tutors present challenges. After this investigation, only five of the nine tutors expressed willingness to continue into the following year. Scaling the program will, therefore, require strategies to recruit new tutors and sustain their engagement. In addition, the training process, which relied heavily on volunteer trainers and involved time-intensive monthly field visits, will need to be streamlined to ensure feasibility at scale.

Conclusion

This study demonstrated that paper-based individualized learning content, provided in a familiar language, and supported by personalized feedback through a community afterschool program, can effectively address students' school learning gaps as a low-resource approach. While the individualized approach was particularly effective for mathematics, it was less suitable for early language learners who may benefit from its integration with social and interactive pedagogies. Assertions made from a group-by-group comparison of the results suggest that tutors' capabilities, native locality and therefore natural relationship with the families,

and community support are important factors for sustaining participation.

When considering the generalizability of the findings, it is important to note that only five of Timor-Leste's 13 districts were represented in the samples, and there was a drop in the number of students in the comparison group from pre-test to post-test. Despite these limitations, the relative homogeneity of pre-test results across all groups suggests that low- to middle-income students in other districts of Timor-Leste might achieve comparable outcomes.

These findings hold significance for administrators, demonstrating that more can be achieved with targeted after-school programs and effective tutors. There are implications for the development of curriculum material in Timor-Leste, to employ Tetum language, allow instructions for independent and active learning, cater to a range of abilities, and allow students to take the material home. Non-government organizations adopting a similar strategy may consider encouraging tutors to serve within their own neighborhoods, and fostering the collaboration of the community. Future research may explore sociocultural approaches to teaching English as an alternative language, and investigate the extent to which university graduates may be more effective as academic tutors in Timor-Leste.

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Author Contributions This article is a single-author paper. This article represents the author's original work except where the words, ideas, and contributions of other authors have been acknowledged, cited, and credited using the required style.

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Declarations

Conflict of interest The author has no conflict of interest to report.

Consent to Participate All individuals including parents and students who participated in the research investigation received, sighted, and signed an informed consent form in Tetum language, explaining details about the research activity, the use of data for future publications, anonymity of participants, and secure data storage. Researchers' contact details and an information sheet were provided in case of follow up queries.

Consent for Publication All participants gave written consent for the publication of material reported on in this article.

Ethics Approval The research investigation presented in this thesis has received the ethical approval of Charles Darwin University *Human Research Ethics Committee* in a statement that the research investigation meets the requirements of the *National Statement on Ethical Conduct in Human Research* (National Health and Medical Research Council & Australian Research Council, 2023).¹ It also received approval by the *Instituto Nacional de Ciencias e Tecnologia* (The National Institute of Science and Technology of Timor-Leste) under the condition that a final report is provided to the Institute at the conclusion of the project (Ref No. 098/Pres. Exec/INCT/V/2022). In addition, local authority (village or neighborhood chiefs) permitted collection of data from the classes.

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