LONGITUDINAL STUDY OF LEARNING ACHIEVEMENT OF STUDENTS IN THE AUTONOMOUS REGION IN MUSLIM MINDANAO

POLICY FORUM REPORT 2

Policy Forum Report 2

This report presents selected results from the LearnARMM study, with a focus on three main points for discussion. This report is prepared for presentation at an invitational forum, hosted by DFAT.

LearnARMM is a study designed to track and analyse the learning achievement of students in Alternative Delivery Mode (ADM) schools in rural and remote areas of the Autonomous Region in Muslim Mindanao (ARMM) through the Bangladesh Rural Assistance Committee (BRAC). The ADM program is a component of the ongoing BEAM-ARMM Program supported by the Australian Government.

Esther Care

Project Director

Authorship of this report:

Care, E., & Pavlovic, M.

LearnARMM Reports

Development Report 1	The development of K and Gr 1 tools	2015
Research Report 1	Time 2 research data capture, and Time 1-2 analyses	2015
Policy Forum Report 1	Summary Report for National Policy Forum August 2015	2015
Research Report 2	Time 3 research data capture, and Time 1-3 analyses	2016
Case Study Report	2015 Case Study	2016
Fieldwork Report	Fieldwork in LearnARMM	2016
Summary Report	Summary of project, process, and results	2016
Test Manual	Test Manual administration guidelines	2016
Research Report 2	Time 2-3 report and final results	2016
This report	*Policy Forum Report 2*	*2016*

TABLE OF CONTENTS

ACKNOWLEDGEMENT

EXECUTIVE STATEMENT

The original intention of the implementation of a large scale Alternative Delivery Mode teaching and learning system (ADM) by [then] Australian AID in 2012, was to provide out of school children with education beyond the learning opportunities that occur naturally through these children's families and communities. The ADM was structured somewhat differently to the Autonomous Region of Muslim Mindanao's (ARMM) Department of Education (DepEd) education provision, in response to the local circumstances that were denying them access to DepEd schools. However, the ADM did offer the opportunity for these children to experience the K-12 curriculum in its first years of implementation.

The Assessment Curriculum and Technology Research Centre (ACTRC), hosted by the University of Melbourne and the University of the Philippines, designed a study to track the learning progress of these students. Given the coincidence of the implementation of the new K-12 reform and the need to monitor the effectiveness of the ADM program, a logical approach was to identify the degree to which the ADM students achieved against the K-12 curriculum. Accordingly, ACTRC designed a suite of assessment tools to describe progress in students' language and mathematics learning from Kinder to Grade 2.

Children enrolled in the ADM as well as their peers enrolled in DepEd participated in the monitoring study over three years, from 2013-2016. With the final assessment event held at the end of School Year 2015-2016, it is clear that children studying in both learning systems are achieving at an equivalent level in both language and mathematics.

This Executive Report has as its focus just three points based on its study that should be considered when contemplating future education initiatives in Mindanao. First it reports on progress of students across the two learning systems; second, it analyses how students are lost from the study and from the formal education environments, and who these students are; and third it identifies how the assessment results and information can be used as part of the teaching process in order to contribute back to the primary goal - education of children in ARMM.

CONTEXT

The longitudinal study tracking of children was undertaken in two provinces of ARMM - Lanao del Sur and Maguindanao (APPENDIX B). Lanao del Sur is home to approximately 220,008 school aged children, the majority of whom speak Meranao as their Mother Tongue. Maguindanao is home to approximately 91,720 school aged children[1], the majority of whom speak Maguindanaon as their Mother Tongue. Accordingly, the assessment tools for this study were developed in relevant Mother Tongue for use by both populations. As a feature of the K-12 reform, the use of Mother Tongue in the classroom was introduced as the Language of Instruction. This was a timely feature of the K-12 reform in the context of providing formal learning and teaching environments particularly for children in the remote communities who were unlikely to have basic communication skills in Filipino or English.

---

[1] DepEd 2015-2016

HOW DID THE CHILDREN START OFF?

(1) What were the children's living circumstances, and; (2) what were the children's early demonstrations of attainment against the K-12 curriculum? Although children in the most remote communities might be expected to have very different demographic characteristics than children in semi-remote or rural communities in terms of socio-economic status and living conditions, this study collected information that shows just slight differences. Children who were enrolled in the ADM tended to come from families with very slightly lower socio-economic status than DepEd enrolled children. This means that there were some differences in terms of educational background of families, in occupational status, and consequently in ownership of amenities and access to facilities. Naturally these differences prevailed throughout the study. It is well-documented that such familial and community differences account for some differences in student learning outcomes. Consequently, it was important to track for the impact of family and community factors.

It was important to know what the skills of children across the two learning systems were at the very beginning of their study. In the early years, children develop cognitive and social skills as a natural process. A quite small amount of input, or stimulus for learning, facilitates that learning. Where we have children who do not differ significantly in their preparedness for natural acquisition of skills, it is reasonable that they will acquire formal learning skills in a reasonably similar manner to each other.

TWO COHORTS OF STUDENTS WERE STUDIED

The Kinder cohort in School Year 2014-2015 were assessed toward the beginning and end of their year of learning. Simultaneously the Grade 1 cohort in the same School Year was followed, but through to the end of School Year 2015-2016 as they completed Grade 2.

WHAT WERE THE LEARNING ENVIRONMENTS OF THE STUDENTS?

The students attending the ADM were enrolled in learning centres initiated and coordinated by BRAC. In this document, these are henceforth referred to as LC (Learning Centres). LC are typically one classroom learning environments in which a Learning Facilitator takes on the teacher role with a group of a maximum of 30 children. The design of the LC is that the Learning Facilitator takes the children each year into the succeeding grade learning level. This means that the students do not have the wider experience of learning in a large state-run education system, which may involve greater regulation in the general environment, greater access to a larger and more diverse group of students, and encounters with teachers other than the dedicated classroom teacher. The students in the LC are totally reliant on the competence and motivation of their Learning Facilitator for the effectiveness of the learning experience. The LC are relatively well resourced in terms of learning materials, benefiting from the funding from the Australian Government; and from the commitment of BRAC to development of Mother Tongue materials, professional development of the Learning Facilitators, and curriculum infrastructure.

The students attending the DepEd ARMM schools are spread across small and large schools. Many of these are in similar geographic and socio-economic locations to the LC. Selecting these schools provided the study with reasonable assumptions that any differences in achievement by students in the two learning systems would be due primarily to the immediate classroom environment rather than due to external factors. These assumptions were checked by collecting socio-economic information about all students in both systems. Across the DepEd ARMM schools there is diversity in terms of resourcing, and due to factors associated with school size. Students in these schools are taught mainly by the one classroom teacher within a School Year, but students will be familiar with other teachers who may take their classes from time to time. Students study with a different classroom teacher in each grade level as they progress. This means that over the period of the study, DepEd students will have studied with different teachers, while the majority of LC students will have studied just with the one.

ATTRITION

Attrition is the number or proportion of students lost to the study. Table 1 identifies number of students *whose data were valid for inclusion in the research analyses*. The loss of students from the Grade 1 cohort (blue shading) from first to third test event was considerable, with a loss of approximately 50% from August 2014 to February 2016. This loss was due to a variety of factors, with the most influential being conflict in Maguindanao (end of Grade 1, February, 2015) and more recently in Lanao del Sur (end of Grade 2, February, 2016). While conflict and student displacement played a major role in the attrition rate, in addition some students were lost to the research sample due to inability to verify student identity at re-tests.

Time	Province	DepED				LC			
				Total					Total
		Kinder	Grade 1	Grade 2		Kinder	Grade 1	Grade 2	
2014	Lanao del Sur	480	600		1080	445	586		1031
	Maguindanao	450	662		1112	447	595		1042
2015	Lanao del Sur	405	525		930	406	557		963
	Maguindanao	335	475		830	394	423		817
2016	Lanao del Sur			265	265			302	302
	Maguindanao			360	360			305	305

Table 1. Longitudinal research samples Grade 1 (blue) and Kinder (grey) Time 1 to Time 3

Table 2 shows that nearly 50% of students are lost to the study due to a combination of not presenting for the final assessment event or to invalid data been provided. Table 3 shows that the

nearly 32% of students are totally lost to the study by 2016, due to not presenting for the final assessment event.

Province	School Type		Total by Province	2016 Sample
	DepEd [%]	LC [%]	[%]	[%]
Lanao del Sur	55.83	48.46	52.19	
Maguindanao	45.62	48.74	47.10	
Total by School Type	50.48	48.60		
Total Valid 2016				49.57

Table 2. Attrition between 2014 and 2016 using only valid cases (analysis sample)

Province	School Type		Total by Province	2016 Sample
	DepEd [%]	LC [%]	[%]	[%]
Lanao del Sur	23.33	20.99	22.18	
Maguindanao	43.35	38.66	41.13	
Total by School Type	33.84	29.89		
Total 2016				31.93

Table 3. Attrition between 2014 and 2016 (all students tested in 2016 including invalid cases)

Table 4 shows difference by gender in attrition from Time 1 to 3 across provinces and learning systems. Overall more girls are retained in the system. Lanao del Sur in particular loses many more boys from DepEd by February 2016.

Province	School Type	August, 2014		February, 2016	
		Boys	Girls	Boys	Girls
Lanao del Sur	DepEd	290	301	108	152
	LCs	295	274	172	173
	Total by province	585	575	280	325
Maguindanao	DepEd	325	314	129	156
	LCs	294	281	135	164
	Total by province	609	595	264	320

Table 4. Difference in attrition by gender across province and school type for Grade 1 cohort

Another feature of attrition is the degree to which this is associated with school achievement. Students were grouped in top, low and mid-range quartiles based on their results from the baseline. Figures 1 and 2 demonstrate that higher attrition rates are associated with lower performance for both learning systems and provinces. However, Lanao del Sur LC were overall more successful in retaining students at each level.
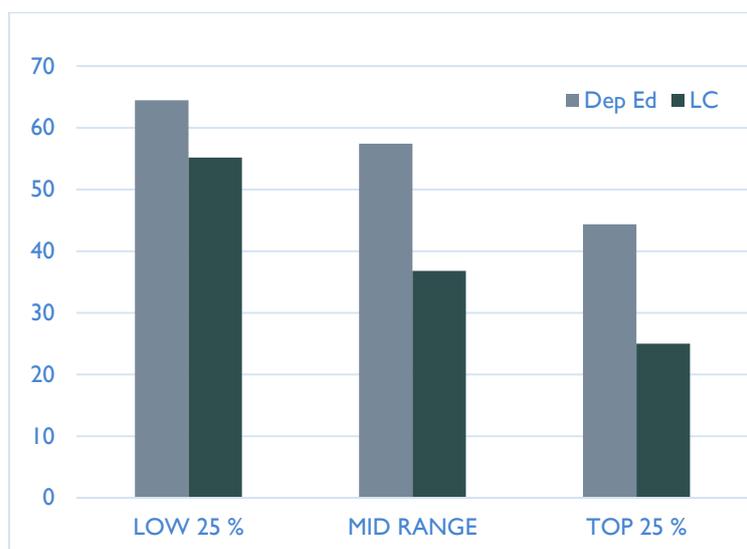

Figure 1. Attrition rates across DepEd and LC for low, mid and top performing students for Lanao del Sur
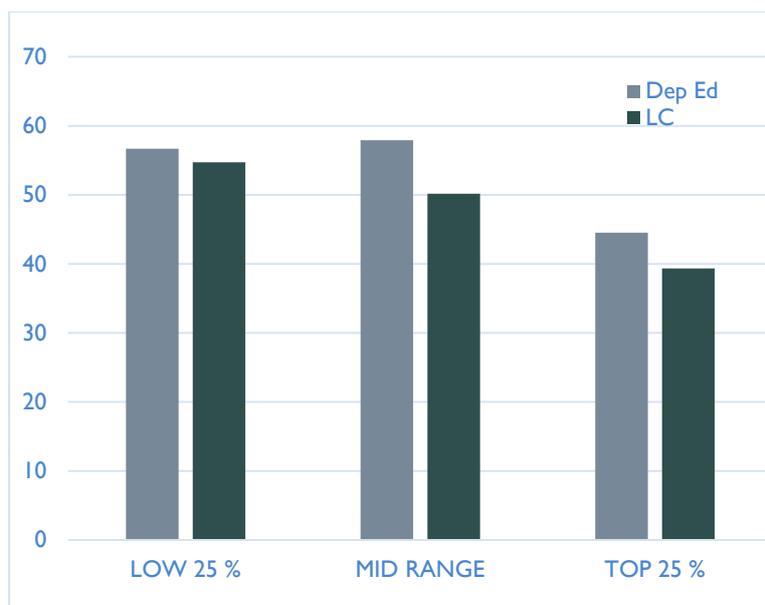
Figure 2. Attrition rates across DepEd and LC for low, mid and top performing students for Maguindanao

In addition, for DepEd students, attrition was higher for students who had not attended Kinder than for those who did.

Accordingly, the factors that are responsible for losing children from the education system are many and varied. From these data, it is clear that conflict situations impact student attendance at school, but that not all children are equally at risk. The LC learning system retains more of their students. Gender is another risk factor - boys are more likely to miss school at this age than girls. Early education experience is a protective factor - children who attend a Kinder year are more likely to stay in class than those who do not. Academic performance is both a protective and risk factor. Of those children who no longer attend school, there are more lower performers than higher.

ACHIEVEMENT

WHAT ARE THE BASELINE SKILLS OF STUDENTS ENTERING ARMM LCS AND DEPED SCHOOLS?

The Numeracy and Literacy tests were designed to measure constructs based on the key standards for mathematics and literacy as defined in the Philippine curriculum.

Key Standards for Mathematics (K-G3)

The learner demonstrates understanding and appreciation of key concepts and skills involving numbers and number sense, measurement, geometry, patterns and algebra, statistics and probability as applied, using appropriate technology, in critical thinking, problem solving, reasoning, communicating, making connections, representations and decisions in real life (DepEd v.12_2012).

The Numeracy test is designed to measure knowledge, skills, and understanding of concepts across the curricular domains for mathematics content covered in the Philippine curriculum.

Key Standards for Literacy (K-G3)

The learner should be able to demonstrate eagerness to explore and experience oral and written texts and to communicate meanings and feelings effectively (DepEd v.12_2012).

The Literacy test is designed to measure knowledge, skills, and understanding of concepts across the curricular domains for language and literacy content covered in the Philippine curriculum.

As reported in Research Report 1, the baseline proficiencies of students entering the two learning systems differ. In general, the proficiency levels of students entering LC are slightly lower than those entering the DepEd system. The occupational and educational levels of parents of students in the two systems differ, with slightly higher occupational levels (in terms of skill requirements) and educational levels among the DepEd population. There are also differences in home index and educational tool index across the two groups, with the DepEd population again having slightly higher levels of home facilities (such as electricity) and access to education resources.

IS THERE VARIATION IN THE RATE OF LEARNING ACROSS THE TEACHING CONTEXTS?

There is slight variation in the rate of learning across the learning contexts. Although the two groups start at slightly different levels, this gap is neutralised nearly two years later. Data from the Kindergarten cohort show that the LC group start at a lower level, but by the time they were assessed at end of their first year of schooling that gap was reduced. Students in the Grade 1 cohort showed some differences still present at end of Grade 1 but by end of Grade 2 all the differences had disappeared.
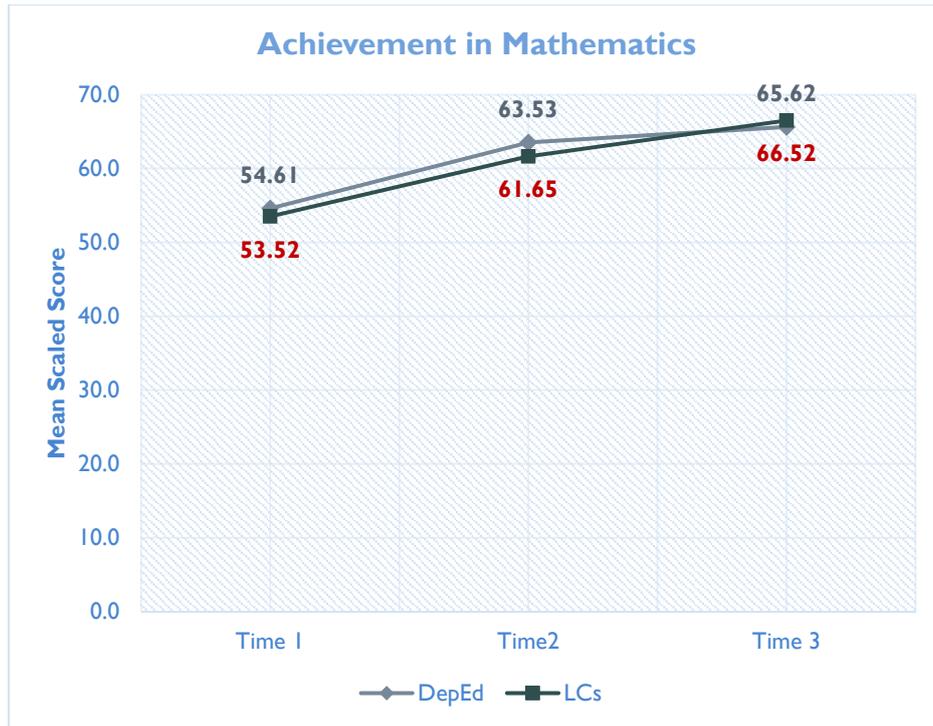
Achievement in Mathematics

Figure 3. Progress in Mathematics from Time 1 to Time 3 across school type (DepEd N = 625; LC N = 606)
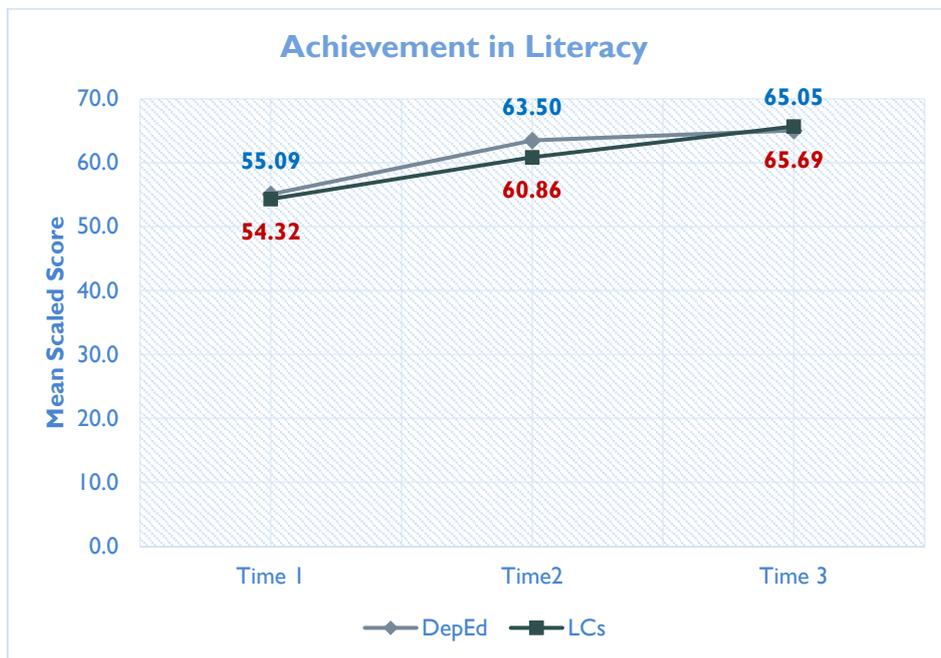
Achievement in Literacy

Figure 4. Progress in Literacy from Time 1 to Time 3 across school type (DepEd N = 625; LC N = 606)

Based on the data informing Figures 3 and 4 across the three assessment events for the Grade 1 cohort, there are no statistically significant differences in overall progress in Mathematics and Literacy according to province, learning context, or gender.

A final point of interest in tracking student progress is to identify the degree to which all students within a cohort progress rather than only sub-groups of students. Consistent with the Sustainable Development Goals, the intent is that all students are provided with learning opportunities not only in literacy and numeracy but in other skills relevant for life and the workplace. An example of Mathematics progress in Lanao del Sur (Figure 5) illustrates student progress using as baseline their performance at February 2014. Students were grouped in low 25%, mid-range 50% and top 25% with respect to province and educational context. The hair and whisker lines illustrate the range of scores around the mean for each group. In this example, it is noticeable that there is greater stability of performance within the LC group than DepEd, as indicated by the narrower hair and whiskers. Notwithstanding some fluctuations in rate of progress across the duration of the study, by end of Grade 2 students in both learning systems within Lanao del Sur achieve similar outcomes. This situation is similar for Maguindanao and for literacy. The feature of these findings is that all children who remain within the system are progressing.
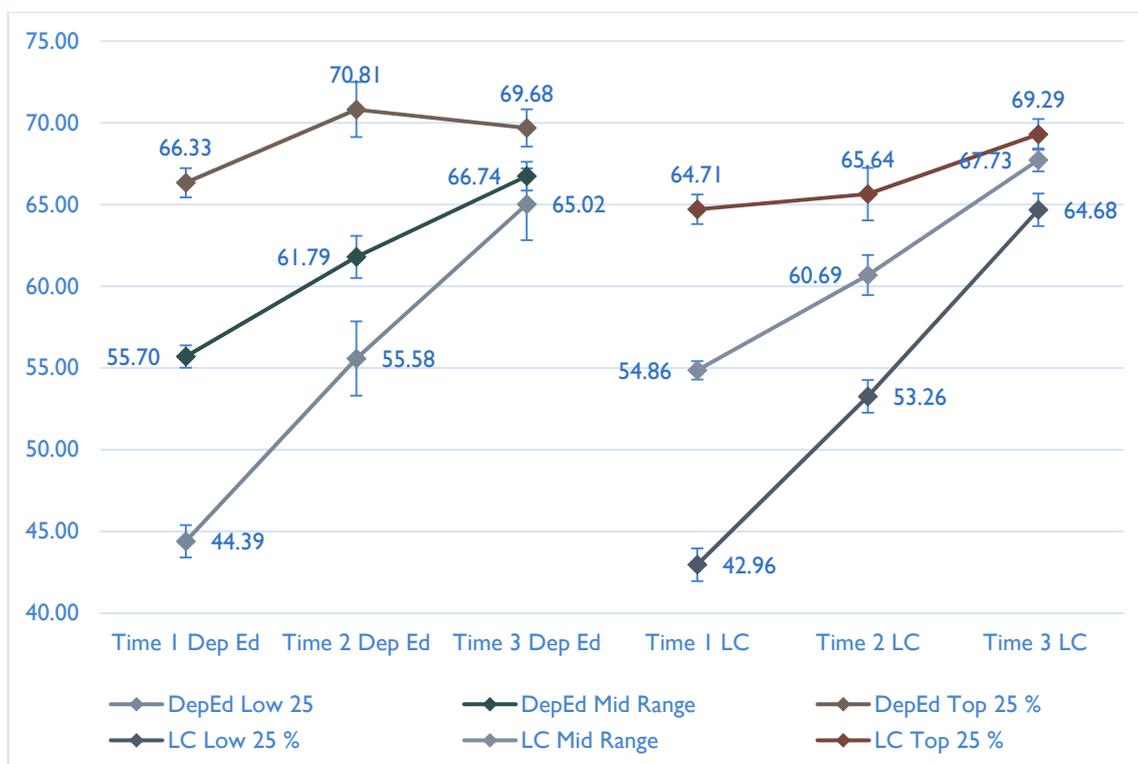

Figure 5. Student progress in mathematics in Lanao del Sur based on students' baseline performance

HOW CAN THE RESULTS BE USED BY THE TEACHERS?

Student results are presented at both individual and class level to provide feedback to teachers about the progress of their students. The system of reporting needs to be explained to teachers, since it represents a use of assessment results that is different from the majority of their experience. The results are presented as skills profiles (Appendix A) that are aligned to the curriculum which the teachers are teaching. This way the teachers can know which particular concepts the student has been able to learn, and which they are currently on the edge of learning.

There are a variety of reports that have been provided to participating schools and teachers as part of the LearnARMM study. In order for them to benefit from these, continuing professional development that addresses the nature of how students progress through sequences of learning materials is necessary. The report feedback acts as a teaching device in its own right, and rests on the skills descriptions shown in the Appendix. The use of assessment results in this way is not widespread, and in order to support their formative and classroom use, a system-wide approach is required. Release of DepEd Order No. 8, s.2015 provides a strong signal to the system for these practices, but a coordinated approach to professional development of teachers needs to be implemented.

CONCLUSION

Children's acquisition of literacy and mathematics as guided by the K-12 curriculum takes place roughly similarly across the two learning systems of the ADM and DepEd ARMM. Although students attending the two systems come from slightly different socio-economic backgrounds, this potential risk factor to learning is not apparent by the end of Grade 2. Students at most risk of leaving school are characterised by lower academic results, are boys, will not have attended Kinder, and will be located in a geographic area prone to violence and conflict. Notwithstanding this, there is a possibility that attendance in a learning system tightly bound to the community might reduce the attrition.

APPENDIX A

Levels	Description of the Numeracy progression
6	Solve problems that require number operations using knowledge of place value. Decompose a given number. Identify and use units of time (days in a week, and 15- and 30-min intervals).
5	Find missing element from a number sequence. Perform tasks that require number operations and completion of number sentences. Understand and use units of time such as hour, day, week, and months.
4	Divide a set of objects into groups of equal quantities. Order numbers and complete number patterns that require skip counting. Conduct simple computation with money using familiar denomination. Identify place value and give the value of a digit in a number. Use graphic representation to relate parts to the whole. Read numbers in a table (calendar). Subtract a number from itself. Understand and apply the concept of zero in number operations (addition and subtraction).
3	Perform tasks with visual/pictorial cues to estimate capacity using non-standard measurement. Identify and classify basic shapes based on their geometrical properties. Compare numbers using mathematical relation symbols (greater than, less than). Solve one-step word problems.
2	Compare sets using estimation and/or counting strategies. Recognise and record equal quantities. Group and classify objects according to attribute. Perform simple operations on numbers. Recognise money in familiar denominations.
1	Count objects and compare small quantities. Compare objects based on properties such as length and weight. Perform simple addition and subtraction operations on objects using counting strategies.

Appendix Table 1. Numeracy level descriptions

Levels	Description of the Literacy progression
6	Identify text and story structure (beginnings and endings). Recall and connect information in the story one has read. Read with comprehension paragraph-level text that is age appropriate. Write short paragraph about a given topic. Observe paragraph-level structural rules such as capitalisation, indentation, and proper punctuation.
5	Apply phonics knowledge consistently to read and spell complex word structures. Recognise and read with attention to sentence-level structure. Read simple sentences. Write text (sentence) describing everyday events.
4	Know the names and sounds of letters and provide words that begin with less frequently-occurring letters. Apply phonics knowledge to read and spell words with simple word structure. Record ideas using symbols and/or words.
3	Recognise that words are made of smaller units (sounds and syllables). Know the names and sounds of letters and provide words that begin with frequently-occurring letters. Use phonics knowledge to distinguish between words that sound similar. Demonstrate understanding of proper book orientation and concepts about print. Identify words that rhyme. Listen and respond to questions about key events in a text that is read aloud. Record ideas on a given topic using drawings and single words.
2	Distinguish between letters, numbers and other symbols. Identify similar and different sounds in words. Understand that words are read from left to right. Listen to a story and make inferences about the plausibility/reality of the described events.
1	Respond to questions relating to personal experience. Describe familiar situations and provide additional detail when prompted. Identify familiar animals, things, and objects. Understand that meaning is assigned to words.

Appendix Table 2. Literacy level descriptions

APPENDIX B

ACTRC is a partnership between the University of Melbourne and the University of the Philippines, supported by the Australian Government