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VSO

SMS STORY

Papua New Guinea

IMPACT ASSESSMENT REPORT



SMS Story

Executive Summary

2013

Implemented by Voluntary Services Overseas, in partnership with the Papua New Guinea Department of Education.
Funded by the Australian Government, through a research grant from the Economic and Public Sector Program.

Dedicated to the late Mary Endiken, Simbu senior elementary standards officer, who was passionate about children's reading, excited about SMS Story, travelled with us to remote schools and who was an invaluable member of our team.

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Executive Summary

Introduction

The aim of the SMS Story research project was to determine if daily mobile phone text message stories and lesson plans would improve children's reading in Papua New Guinea (PNG) elementary schools. The research was a controlled trial in which half of the teachers received text messages for twenty weeks and half did not. The stories and lesson plans were designed to introduce children to reading English and followed an underlying phonics and key word based methodology.

Teachers in the trial received a cartoon poster explaining how to use the daily text messages and received a total of 100 text message stories and 100 related text message lessons for two academic terms. They did not receive any in-service training. Research was conducted in rural elementary schools in two provinces, Madang and Simbu, and has involved a baseline reading assessment, mid-point lesson and classroom observations and an end-point reading assessment.

SMS Story was funded by the Australian Government, through a research grant from the Economic and Public Sector Program. The project was designed and managed by Voluntary Services Overseas, in partnership with the Department of Education.

Research design

The primary research question addressed was: Can mobile phone text message lesson plans and stories for teachers improve the reading ability of students in elementary classrooms in Papua New Guinea? In addition, sub-questions examined the impact on teacher practice and explored the implications of using mobile technology within the education sector. Table 1 shows the sample size of the schools, teachers and children across two provinces.

	Schools		Teachers		Children	
	Baseline	End-point	Baseline	End-point	Baseline	End-point
Active	26	26	56	51	1209	982
Control	26	25	58	51	1269	1004
Total	52	51	114	102	2478	1986

Table 1 Sample size of schools, teachers and children

Findings

At baseline, there was no statistically significant difference between the active and control groups, with respect to school characteristics and children's reading assessment results. The baseline results showed that many children had limited or no reading (for example, half of the children could not read any high frequency English words). At the time of enrolment, all participating schools had very few reading books, if any, available in the classroom. On average, across both sets of schools, children's reading did improve over the two terms with children at SMS Story schools improving significantly more.

Random visits to active schools during the intervention period showed that most teachers were actively engaging with the content sent to them as text messages. This demonstrated that the SMS technology (using Frontline SMS delivered over the Digicel mobile network) was effective in reaching teachers. There was a large change in the reported use of teaching strategies promoted by SMS Story lesson plans and poster (for example, 42 teachers in active schools (n=51) against 12 teachers in control schools (n=51) reported "*reading stories to the children every day*").

At the end-point reading assessment, there was a statistically significant difference (Figure 1 and Table 2, below) between the results of the control and active groups, with the active group performing better than the control group across four of the five reading skills tested. This improvement is seen in both grade 1 and grade 2 and with girls and boys.

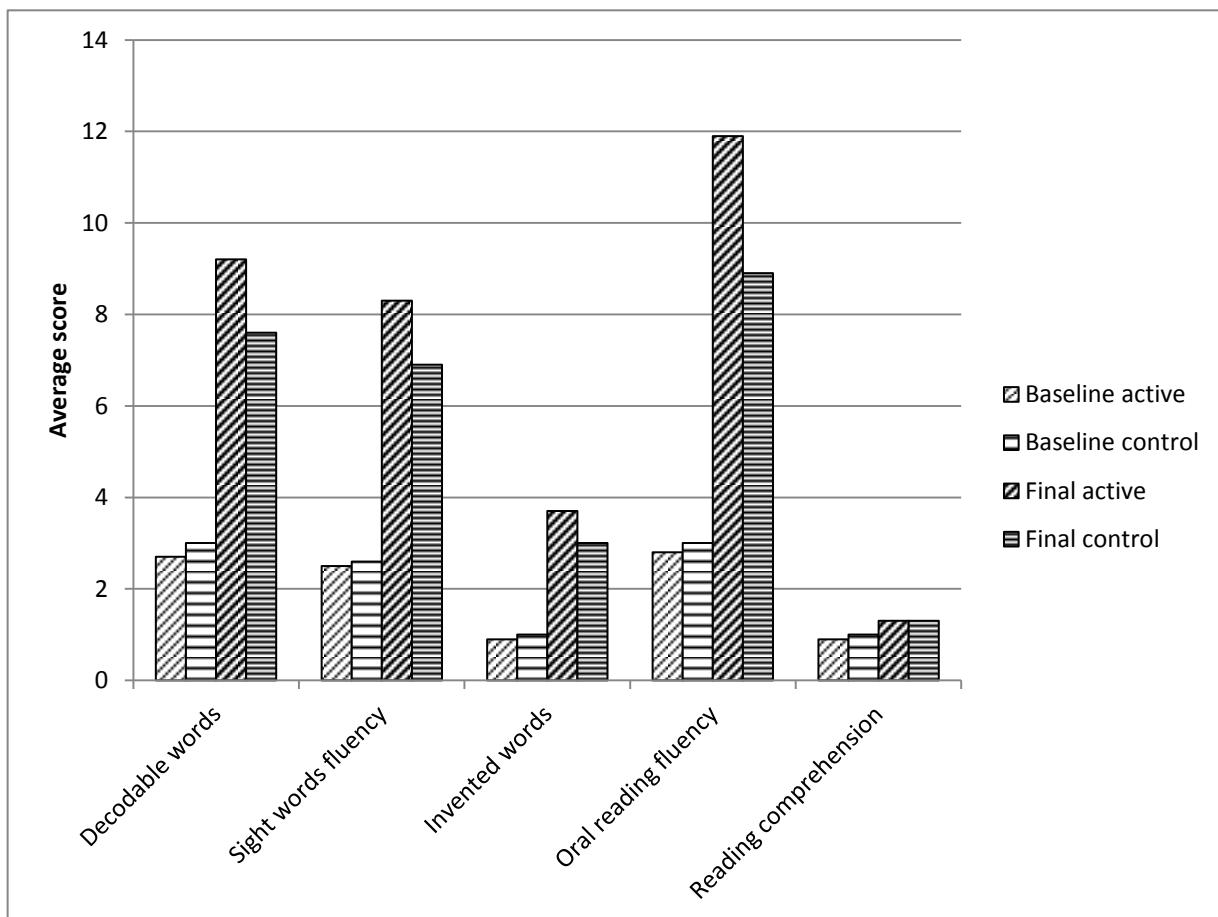


Figure 1 Comparison of student reading scores before and after SMS Story in active and control school

Children who did not receive the SMS Story were approximately twice as likely to be unable to read a single word of three sub-tests (decodable words, sight words and oral reading). In other words the intervention almost halved the number of children who could not read anything compared with the control schools.

Reading section	Treatment group	Baseline March-April 2013				Final Oct -Nov, 2013			
		N	Mean	Std deviation	p - value	N	Mean	Std deviation	p - value
Decodable words	Active	1208	2.7	4.4	0.111	982	9.2	9.8	0.001**
	Control	1270	3	5.1		1004	7.6	10.9	
Sight words fluency	Active	1208	2.5	4	0.666	982	8.3	8.8	0.002**
	Control	1270	2.6	4.5		1004	6.9	10.7	
Invented words	Active	1208	0.9	1.9	0.6	982	3.7	3.4	0.000**
	Control	1270	1	2		1004	3	3.3	
Oral reading fluency	Active	1208	2.8	6.3	0.494	982	11.9	12.5	0.000**
	Control	1270	3	7.3		1004	8.9	13.6	
Reading comprehension	Active	278	0.9	0.9	1.2	772	1.3	1.2	0.971
	Control	279	1	1.1		557	1.3	1.4	

** Significant at 5% level ($p < 0.05$)

Table 2 Progression in students' reading, by treatment group

Therefore, the text messages to teachers improved students' reading ability in decoding, fluency, reading familiar high frequency words and reading phonetically correct nonsense words. The research did not find a statistically significant improvement in reading comprehension and generally children showed low reading comprehension skills in both grades and little progression between grade 1 and 2.

Costs

The estimated cost of delivering the text messages and subsequent reading improvement is approximately K2.01 per child (excluding costs of distributing the poster, enrolling schools and one-off costs developing the lessons and stories). It is highly likely these unit costs can be reduced by scale. In addition, it should be possible to automate the opt-in and teacher database management. In the absence of reading materials and scripted lessons in elementary schools SMS Story provides a simple and cheap strategy for raising reading standards.

Other learning from SMS Story

The trial also found a strong negative impact on students' reading caused by the absence of the classroom teacher to attend provincial trainer-directed training. Unsurprisingly the students of these teachers performed poorly on the final reading assessment. Importantly SMS Story does not require a teacher to be absent from a class for training.

There remained a worryingly large number of children who scored zero on the tests, particularly in grade 1, even after the intervention. Although this was significantly lower than the control schools a more sustained intervention (beyond two academic terms) may have a more profound effect.

As a controlled trial, this intervention has a rigorous research base. The results demonstrate that appropriate use of mobile phone technology can have a positive impact upon educational outcomes in resource-constrained settings. In PNG, it is recommended that the methodology of sending daily text messages to teachers be pursued further. In other countries, it is recommended that trials be undertaken as controlled trials so that statistically significant data can be generated.

Recommendations

1. Scale up SMS Story in PNG

1.1 Design and implement a national SMS Story project to allow as many elementary teachers as possible to receive the daily stories. For example, contract a technology partner for automated system, conduct mass advertising for free teacher and parent opt-in, and possible distribution of posters via provinces and trainers

1.2. Design and implement monitoring and evaluation protocols and instruments for the scale up

1.3 Upload the stories and lesson plans to a mobile-friendly website version

2. Improve the stories and lesson plans based on the learning from the trial

- 2.1 Design and implement 30 weeks of stories and lesson plans for Grade 2 to enable two academic years of stories and lesson plans
- 2.2 Write an additional 10 weeks of stories and lesson plans for Grade 1 focusing on the grapheme and word weaknesses identified in the trial and ensuring reinforcement of initial phonemes and 100 high frequency words
- 2.3 Increase the quantity of comprehension questions in the lesson plans
- 2.4 Add additional relevant information to the stories and lessons. For example, information and motivational messages for events such as Book Week and health development; including different cultures and genres in stories; and strengthening the importance of teaching the stories in order

3. Conduct further research into variations of the methodology

- 3.1 Trial a free phone-in automated service to allow teachers to hear the text, lesson plan and sounds
- 3.2 Commission research to compare SMS Story effectiveness with other reading improvement methodologies

4. Use the stories and lesson plans in other reading interventions

- 4.1 Adapt and publish the stories and lesson plans for “reading recovery” for lower primary children who are struggling with English or have special educational needs
- 4.2 Integrate stories and lesson plans into other reading materials produced by the Department of Education