

Technology use in the Classroom = A Massive Opportunity for Language Gains

SchoolNet South Africa is a non-profit organisation whose goal is to harness the power of technology to create communities of lifelong learners, able to sustainably enhance teaching and learning. The purpose of this learning brief is to share the findings of the research conducted over the past three years which has tracked the development of two cohorts of Foundation Phase learners. These learners have experienced a technology-enabled, play-infused learning environment from Grade R and while five foundational literacies have been assessed each year, this learning brief focused only on the acquisition of oral English skills. First, we will discuss language acquisition and describe the assessment methodology; then we will present the data comparing the development of English oral skills through acquisition in our project and control groups of learners; and to conclude we will summarise the findings from the data, raise further questions and discuss the unexpectedly large opportunity our research has shown for acquisition of English skills through the use of technology in the classroom.

The Learning Gains through Play (LGP) project focuses on the development and practice of foundational literacies in Grades R and 1 through the innovative use of technology-enabled, learner-centred play in the classroom. Intel tablets loaded with carefully selected apps and games have been integrated into learning activities to stimulate and enhance fine-motor skills and to develop and practice visual literacy and numeracy skills. Xbox Kinect games engage learning through play, develop gross-motor and fine-motor skills and provide opportunities to reinforce visual and number literacies. As English is the language medium for almost all of the apps and games, one of the components of the research is to measure any acquisition of English oral language that develops as a result of interacting with these apps and games. This last literacy is the focus of this learning brief.

Language Acquisition versus Language Learning

Research has shown that oral language skills have a profound impact on children's preparedness for Foundation Phase and on their success throughout their academic career. In the Learning Gains through Play project and control schools in which English oral skills were assessed, Foundation Phase learners are taught and learn in their mother tongue (isiZulu and isiXhosa). In all of these schools, at the start of Grade 4, learners will switch to English as their Language of Learning and Teaching (LOLT). This change will be accompanied by the expansion of the three subjects they began in Grade R to six subjects as they enter Intermediate Phase. It is for this reason that schools assign their most able teachers to tackle the challenges faced by learners transitioning to Grade 4.

Stephen Krashen is a pioneer in the field of language acquisition. Krashen's Second Language Acquisition (SLA) stages of development and his teaching approach, called the Natural Approach, is based on his decades of research and his theory, which in his words is: *"the central hypothesis of the theory is that language acquisition occurs in only one way: by understanding messages. We acquire language when we obtain comprehensible input, when we understand what we hear or read in another language."*

James Paul Gee, a linguistics professor and gaming expert, promotes learning through playing video games. Gee proposes that this technology, which focuses on subconscious acquisition rather than conscious learning should be stressed, particularly if the goal is to help non-mainstream children (low-income, minority children) attain mastery of literacies. (Gee, J.P., 1987. What is Literacy? Teaching and Learning: The Journal of National Inquiry.)

Students learning a second language move through five predictable stages: Preproduction, Early Production, Speech Emergence, Intermediate Fluency, and Advanced Fluency (Krashen & Terrell, 1983).

Stage	Characteristics	Approximate Time Frame
Preproduction	The student Has minimal comprehension. Does not verbalize. Nods "Yes" and "No." Draws and points.	0–6 months
Early Production	The student Has limited comprehension Produces one- or two-word responses. Uses key words and familiar phrases. Uses present-tense verbs.	6 months–1 year
Speech Emergence	The student Has good comprehension. Can produce simple sentences. Makes grammar and pronunciation errors. Frequently misunderstands jokes.	1–3 years
Intermediate Fluency	The student Has excellent comprehension. Makes few grammatical errors.	3–5 years
Advanced Fluency	The student has a near-native level of speech.	5–7 years

Collecting the Data

An assumption was made that using the Xbox Kinect and tablet technology would enable English language acquisition and it was decided to include assessment of acquired English oral communication skills. An oral test was designed specifically for South African Foundation Phase children for whom English was not the Home Language. The test was scripted and administered to Grade R, Grade 1 and Grade 2 learners as a one-on-one interview with all responses recorded. Scores were collected for the following criteria:

- general listening behaviour (engagement and attentiveness)
- listening to follow instructions
- general speaking behaviour (engagement and responsiveness)
- speaking vocabulary
- speaking to answer questions

Specifically designed activities enabled the conversion of learner responses to a proficiency assessment on one of the five stages of language acquisition.

Name: _____ School: _____ GRADE ____

TASK 3 – Listening & Speaking

Evaluator-facilitated Task Guide and Score-card

1. Introduction:

Hello, I am _____ (shake hands) What is your name? Response _____




How old are you _____? (Prompt: how many years?) Response _____

I'm going to talk in English. I would like you to talk in English too.

What languages do you speak and understand? (Prompt: me English, you?) Response _____

LISTENING Skills – Engagement & Attentiveness	SPEAKING Skills – Vocabulary & Language Use
0 = no engagement	0 = no verbal response or single name only
1 = sporadic engagement	1 = monosyllabic/simple verbal responses to more
2 = simple engagement	2 = simple phrase responses (e.g. I'm ..., x years old)
3 = full engagement (eye-contact, focus, connected)	3 = sentence responses/volunteers more verbally

2. Identification Card Questions:

What is this a picture of?	What is this a picture of?	What is this a picture of?
		
Response? _____	Response? _____	Response? _____

SPEAKING Skills – Vocabulary & Pronunciation
0 = no responses verbally
1 = most responses are incorrect/ not recognisable/ not in English/ OR only 1 correct in English
2 = most responses are recognisable in English but monosyllabic/ OR 2 correct in English
3 = all responses correct in clear English - may even volunteer more verbally/ OR 3 correct in English

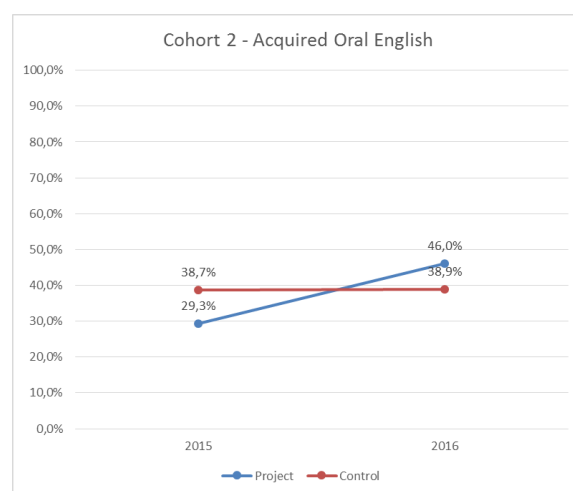
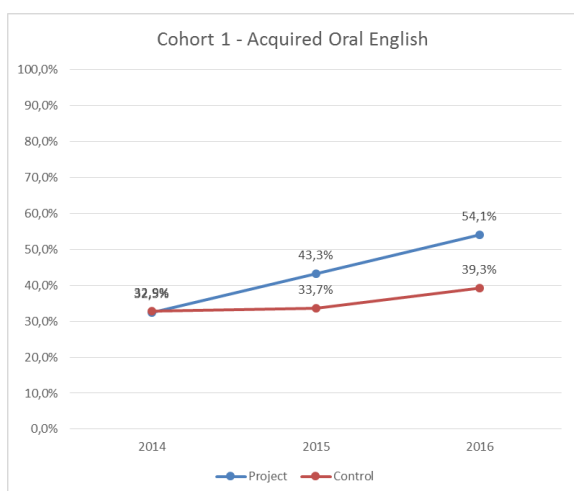
3. Action Identification Questions:		
What am I doing? (Perform action of clapping hands together to make a sound)	What am I doing? (Perform action of touching head with finger tips of right hand and remove)	What am I doing? (Perform action of winking - closing and opening one eye)
Expected Response Guide: No verbal response = (0) Non-English verbal response = (1) English - single noun bases/ hand (2) English - single simple verb bases = clap (2) English - single present participle = clapping (2) English multiple correct words = clap hands (2)	Expected Response Guide: No verbal response = (0) Non-English verbal response = (1) English - verb only = touch (var. HKT) (2) English - noun only = head (var. hand) (2) English - multiple correct words = touch head (var. J) (3) English - multiple correct words = you touch your head (var. J) (3) English - present participle = noun = you're touching your head (var. J) (3)	Expected Response Guide: No verbal response = (0) Non-English verbal response = (1) English - noun only = eye (2) English - verb only = wink (var. blink) (2) English - multiple correct words = close one eye (3) English - multiple correct words = you're winking/ you're closing your eye (3)
SPEAKING Skills – Vocabulary & Language Use 0 = no verbal responses at all 1 = all verbal responses incorrect/ not recognisable/ not in English 2 = most (2/3 out of 3) responses correct in English but singular words (verbs OR nouns but not both) 3 = most responses correct in English but at least one multiple word phrase (verb + noun) 4 = all three responses correct in clear English using sentences with nouns and verbs and correct grammar		
4. Carrying Out Verbal Instructions: (no demonstration provided) Please will you clap your hands together (pause for understanding) ... two times. Please will you touch your nose (pause for understanding) ... with your thumb. Please will you stand up (pause for understanding) ... and turn all the way around.		
Expected Response Guide: Listen for instruction – eye contact and concentration Follow instruction – erection and precision	Expected Response Guide: Listen for instruction – eye contact and concentration Follow instruction – erection and precision	Expected Response Guide: Listen for instruction – eye contact and concentration Follow instruction – erection and precision
LISTENING Skills – Focus & Attention 0 = no correct physical responses 1 = poor action - e.g. claps once/ touches face/ stands/ OR only 1 fully correct 2 = basic action - e.g. claps more than twice/ touches tongue/ half turns/ OR 2 fully correct 3 = exact reaction/ ALL 3 fully correct		
5. Conclusion Thank you _____ (shake hands) Goodbye. Enjoy the rest of your day.		
Comments:		

The following assessments of oral English proficiency were conducted:

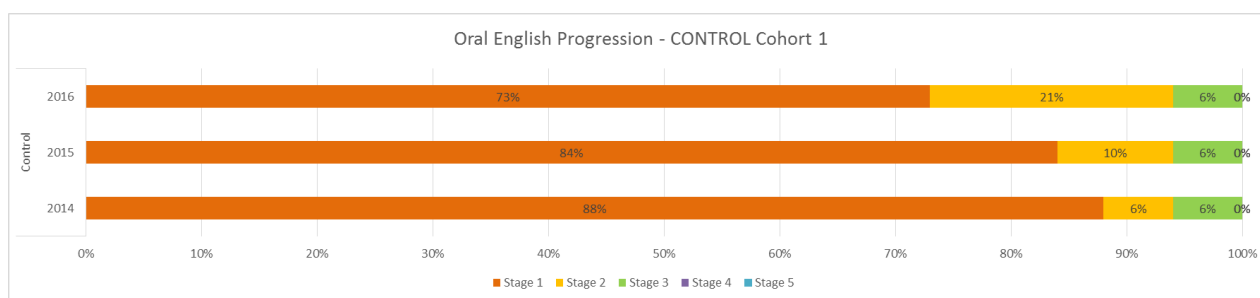
COHORT 1	2014	2015	2016	
LGP Project	Grade R	Grade 1	Grade 2	The same 129 learners tracked over three years.
Control	Grade R	Grade 1	Grade 2	The same 37 learners tracked over three years.
COHORT 2		2015	2016	
LGP Project	Grade R	Grade 1	Grade 1	The same 82 learners tracked over two years.
Control	Grade R	Grade 1	Grade 1	The same 31 learners tracked over two years.

Presenting the Data

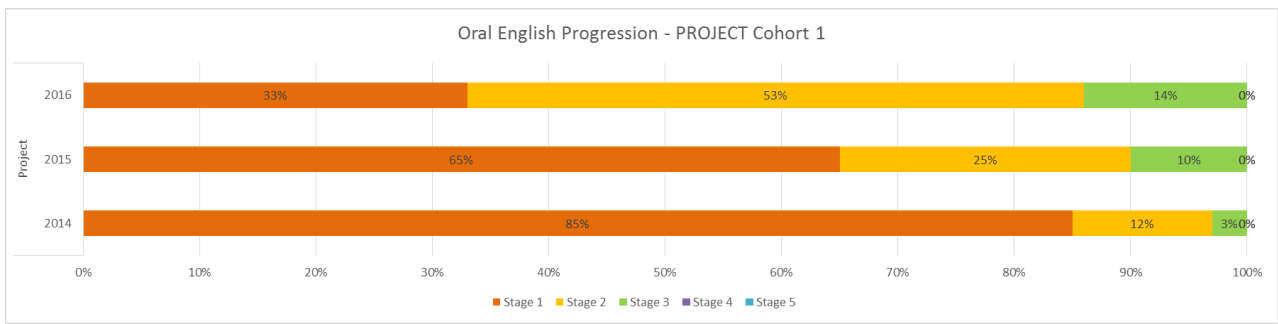
When considering the overall Oral English Skills scores for the project and control groups in each cohort, we see the following.



With both cohorts it is clear that the project learners outperformed the control learners. The Grade R to Grade 1 transition of the Cohort 1 control group learners mirrors that of the Grade R to Grade 1 transition of the Cohort 2 control group learners (less than 1% improvement). While the project learners of Cohort 2 were initially weaker than the control learners and weaker than the Cohort 1 learners of the year before, they were able to “catch-up” on the same improved trajectory as the Cohort 1 over the transition from Grade R to Grade 1. Most interestingly, the improvement of Cohort 1 was maintained from Grade 1 to Grade 2. This has not been the case in the other four literacies tested where both project and control learners dropped significantly in Grade 2.

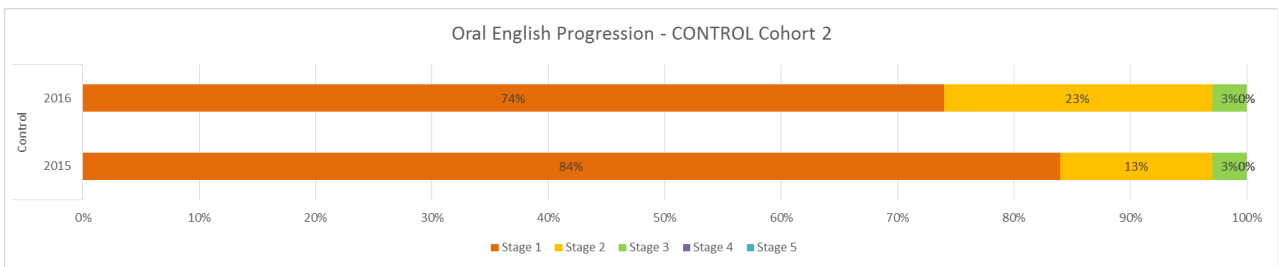


When the learners are assessed on the Second Language Acquisition Stages, their progress becomes even clearer. When considering Cohort 1’s control group, it can be seen that in Grade R, 88% of learners were on Stage 1 (also known as the Silent Stage), with 6% of learners already on Stage 2 and 6% of learners on Stage 3. After one year, now in Grade 1, 4% of learners have progressed to Stage 2 leaving 84% of learners still on Stage 1. The Stage 3 learners have not made any progress. After the next year, a further 11% of learners have progressed from Stage 1 to Stage 2. The original Stage 3 learners have still not made any progress. At the end of the test period, just over a quarter of the learners are above Stage 1.

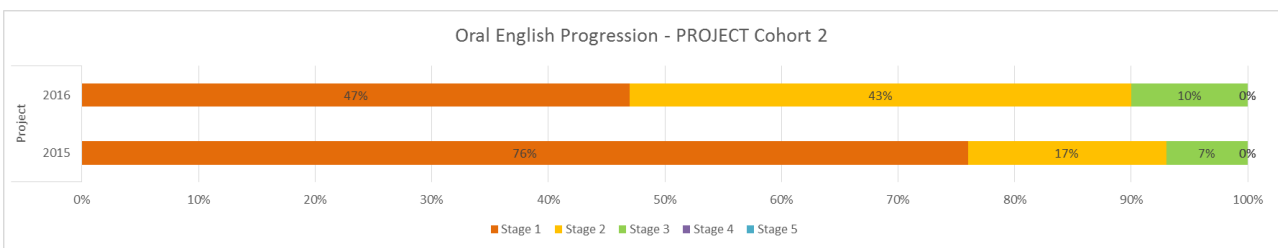


When comparing with Cohort 1's project group, we see at the start that 85% of learners were on Stage 1. 12% of learners were on Stage 2 and 3% were at Stage 3. After one year, now in Grade 1, 20% of learners have progressed to Stage 2, while 7% of learners that were on Stage 2 progressed further to Stage 3. After the next year, a further 32% of learners progressed from Stage 1 to Stage 2. A further 4% were able to progress from Stage 2 to Stage 3. At the end of the test period, more than two-thirds of the learners are above Stage 1.

Cohort 2 data shows a similar pattern. Even though these are different children to Cohort 1, the starting situation is similar with 84% of learners on Stage 1, 13% of learners on Stage 2 and 3% of learners on Stage 3. After one year, now in Grade 1, 10% of learners have progressed from Stage 1 to Stage 2. The learners on Stage 3 have remained on Stage 3.

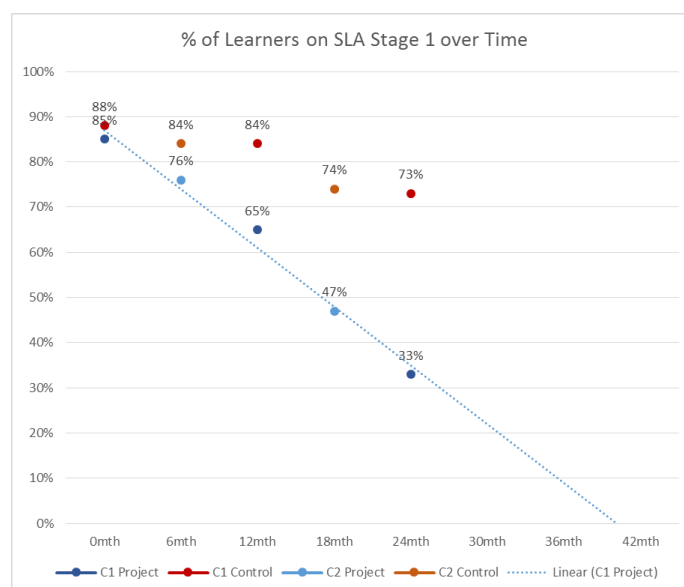


Comparing the control group with the project group reveals the following. At the start, 76% of the Grade R learners were assessed as on Stage 1, with 17% on Stage 2 and 7% on Stage 3. After one year, now in Grade 1, 29% of learners progressed from Stage 1 to Stage 2 and 3% progressed from Stage 2 to Stage 3. This resulted in less than half of the learners on Stage 1 after only one year of intervention.



The improved starting point and overall performance of this cohort of project learners can be attributed to the fact that Cohort 1 Grade R project learners were assessed before receiving the technology in their schools (July 2014). Control groups of both Cohort 1 and Cohort 2 received no technology at all. Cohort 2 Grade R project learners, while they were assessed in July 2015, had access to the technology since the start of their academic year in January 2015. The additional six months of exposure to English through the medium of the tablet apps and Xbox games explains the lower percentage on learners on Stage 1 when baseline testing was administered (76% compared to 84-88%). It also explains the larger improvement in Cohort 2 from Grade R to Grade 1 (32% of learners improved their SLA stage) when compared to Cohort 1 from Grade R to Grade 1 (27% of learners improved their SLA stage).

Plotting the percentage of learners on SLA Stage 1 over the time of the project shows the same trajectory of improvement off SLA Stage 1 for both cohorts.



The data predicts that all learners could have moved up from SLA Stage 1 after 40 months which, with the introduction of tablets and apps at entry to Grade R, could be achieved before the middle of the Grade 3 year. This provides a massive opportunity for preparation to learn in English in Grade 4.

Conclusion

In conclusion, our research supports the theory that successful language acquisition occurs through understanding messages – that making understanding of English in order to play engaging games on a tablet or Xbox console creates the necessary comprehensible input. As Stephen Krashen goes further to say: *“Language acquisition proceeds **best** when the input is not just comprehensible, but really interesting, even compelling; so interesting that you forget you are listening to or reading another language.”*

Our key finding is: Oral English skills can be improved simply by engaging with the tablet apps and video games which use English as the medium of communication.

As with many research activities, more questions have emerged through our learning.

- With further use of the technology in Grade 3 classrooms, can all of the learners escape up off SLA Stage 1 by the end of Foundation Phase (as predicted by our graph)?
- Can the method of language acquisition raise Zulu and Xhosa learners’ English skills beyond Stage 3 or is this the ceiling for acquisition and formal learning is required for further progress?
- Is English at Stage 3 level sufficient to cope with the Grade 4 shift to LOLT in English in South African schools?
- Will the Learning Gains through Play project learners with their improved English oral skills achieve better results than the control learners in Grade 4 in English First Additional Language (FAL) and in their other subjects?