



Learning Gains through Play in the Primary - Final Report



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Acronyms

| | |
|---------|--|
| ANA | Annual National Assessments |
| CAPS | Curriculum and Assessment Policy Statements |
| CDE | Centre for Development and Enterprise |
| CSIR | Council for the Scientific and Industrial Research |
| DBE | Department of Basic Education |
| DGMT | The D G Murray Trust |
| FAL | First Additional Language |
| G1 | Grade 1 |
| GR | Grade R |
| ICT4RED | Information and Communication Technologies for Rural Educational Development |
| IQ | Intelligence Quotient |
| KZN | KwaZulu-Natal |
| LGP | Learning Gains through Play |
| LoLT | Language of Learning and Teaching |
| NEEDU | National Education, Evaluation and Development Unit |
| NSC | National Senior Certificate |
| NSES | National Schools Effectiveness Study |
| MEED | Metro East District of the Western Cape Education Department |
| PGCE | Post Graduate Certificate in Education |
| SES | Socio-economic Status |
| SLA | Second Language Acquisition |
| SMT | Senior Management Team |
| ToC | Theory of Change |
| TPD | Teacher Professional Development |
| WCED | Western Cape Education Department |

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Executive Summary

| | |
|----------------------------|---|
| The Problem | Many South African learners leaving Foundation Phase without the skills required to succeed in successive grades |
| | <ul style="list-style-type: none"> • School environments not supportive or conducive to change • Play-based, learner- centred teaching strategies undervalued by teachers • Innovative technologies rarely used or valued in the Foundation Phase |
| Purpose | To transform learning environments and enhance pedagogies |
| | <ul style="list-style-type: none"> • Improve learning and literacies • Promote play for learning and learner-driven play • Inspire and motivate teachers • Facilitate change leadership • Align leadership to support the project goals of teachers • Build and support communities of practice • Explore the relationship between cognitive and motor development • Promote learner-centred activities through play • Facilitate effective use of learning technologies |
| Action | Provision of technology and professional development over 3 years |
| | <ul style="list-style-type: none"> • Creation of professional development materials • Focus on innovative teaching strategies, digital game-based learning • Promoting play-based, learner-centred pedagogies • Teacher professional development for 103 GR and G1 teachers and for 25 Senior Management Team members • Teachers identify teachable moments and stealth learning opportunities • Change leadership for Senior Management Teams and district officials • 10 schools in two provinces provided with tablets and an Xbox Kinect (donated by Microsoft) and a TV screen (donated by Samsung) • Teachers provided with personal 10" tablets • Impacted 4 308 learners over the 3 years • Peer Coaching programme encouraging collegial support • Ongoing classroom support for teachers and SMTs by the project team • Sharing of project findings and analysis with schools |
| Targeted Literacies | Developmental evaluation of learner performance in foundational literacies |
| | <ol style="list-style-type: none"> 1. Gross-motor Skills 2. Fine-motor Skills 3. Numeracy 4. Oral English Communication 5. Visual Literacy 6. Emotional Literacy |

| Key Findings | Exposure to technology promotes English acquisition |
|----------------|---|
| | <ul style="list-style-type: none"> • Learning gains recorded in all literacies – English Acquisition was the greatest • Learners in project schools consistently outperformed control schools • Gains across all literacies from Grade R to Grade 1 • Fewer gains from Grade 1 to Grade 2 • Oral English measured against Krashen’s 5 stages of 2nd language acquisition • Predicting almost all learners progressing off Stage 1 by mid-Grade 3 • A massive opportunity for preparation to learn in English in Grade 4 • Teachers discovered that digital games can achieve CAPS outcomes • Learners’ curiosity sufficiently enabled to trigger self-driven learning • The lowest performing school at the start became the highest achieving • Success attributed to levelling of playing fields and supportive environment |
| | Lessons learnt |
| Lessons learnt | <ul style="list-style-type: none"> • Learning technologies should be in the hands of the learners • 1:1 ratio is not necessary: group work is beneficial to support learning • Teacher training should precede that of learners’ access to technologies • Teachers confidently transform pedagogies once confident with technologies • Those confident with technology before the project had not imagined the educational potential of using technologies in their classrooms • Schools appreciate sharing of diagnostic findings and planning remediation • Learning through play with technology can achieve CAPS outcomes • Teachers readily transformed their pedagogies when they are achieving CAPS outcomes • Attendance improves on days when learners know it is technology day • Department of Education to focus on outcomes, not just delivery/coverage • Messaging from education departments should link learning through play and different types of games (tech-based or not) with CAPS outcomes • Teachers require mediation of CAPS outcomes – if this happens, it can be highly empowering • Building learning communities in schools – ‘soft’ factors and relationship factors influence effective ICT integration • Teachers attribute disruptive behaviour to poor home backgrounds and the young age of their parent body • Foundation Phase is crucial. |

1. CHAPTER ONE: Introduction to the Learning Gains through Play Project

1.1. Problems in South African Education

It is in the Foundation Phase “that the base for all future learning is established, and if the rudiments of reading, writing and calculating are not firmly entrenched by the end of Grade 3, then both learning opportunities and the larger life chances of young citizens will be curtailed” (National Education, Evaluation and Development Unit, 2013).

The statistics confirm this. Of the 1.2 million children enrolled in Grade 1 in 2001, only 44 percent stayed in the system to take their National Senior Certificate (NSC) in 2012 (Department of Basic Education, 2012a). Analysis of higher education through-put data indicates that less than five South Africans in 100 who enrol in Grade 1 of schooling graduate from university (Govender, 2013). When the Annual National Assessments were introduced in South African schools in 2011, the 35% average achievement recorded for Grade 3 literacy and the 28% average achievement recorded for Grade 3 numeracy was a shock (Department of Basic Education, 2012b). It was even more of a shock to see that performance decreased for the successive grades.

Literacy and numeracy testing within the National School Effectiveness Study (NSES) demonstrated that Grade 5 learners in historically black schools are performing considerably worse on average than Grade 3 learners in historically white schools (Taylor, 2011). In South Africa, only the top 16% of Grade 3 Maths students are achieving at the Grade 3 level (Spaull & Kotze, 2015). Clearly the vast majority of South African learners are not meeting the curriculum requirements even at the very start of their journey through the schooling system.

In a report for the Centre for Development & Enterprise (CDE) on South Africa’s education crisis, Spaull said “for disadvantaged pupils, the gaps between what they should know and what they do know grow over time. This means that as time goes on, children fall further and further behind the curriculum leading to a situation where remediation is almost impossible in high school since these learning gaps have been left unaddressed for too long.” (Spaull, 2013, p. 6).

So a lack of meaningful learning in Foundation Phase results in conceptual gaps which widen with each successive year and prevent progress and success in Intermediate Phase, Senior Phase and beyond. Taylor, Muller and Vinjevold (2003, p. 129) sum up the problem when they state “ the ... requirements of the high school curriculum make it virtually impossible for learners who have been disadvantaged by their early schooling to ‘catch-up’ later sufficiently to do themselves justice at the high school exit level.”

1.2. Tackling the Problems – The Learning Gains through Play Project

SchoolNet South Africa, a non-profit organization, has for the past 20 years pursued the goal of creating communities of teachers and learners using ICTs to enhance teaching and learning. SchoolNet believes in improving existing pedagogies by providing innovative classroom activities that harness new technologies, which promote higher-order thinking skills, and ignite a spirit of enquiry among learners. The inspiration for the Learning Gains through Play project was the Xbox Lakeside Park Primary School Project conducted in 2011. At this primary school in the Vryheid district of Kwazulu-Natal, SchoolNet installed large television screens above the traditional chalkboards in six Foundation Phase classrooms and these screens were connected to the Xbox 360 Kinect gaming console. The findings from the project did not conclusively attribute gains to the Xbox but the learning gains nonetheless were considerable (Mindset-Verbeek, 2011). Another influence on the conceptualisation of the Learning Gains from Play project was the ICT4RED (Information and Communication Technologies for Rural Education Development) project. ICT4RED was the result of a unique partnership between the Department of Science and Technology, the Department of Rural Development and Land Reform and the Department of Basic Education, both National and in the Eastern Cape. The design of the project was undertaken by the Meraka Institute at the CSIR who commissioned SchoolNet to collaborate with them on the teacher professional development and the change leadership aspects of the initiative. All schools and government officials within the district of Cofimvaba were targeted to receive Android tablets. The CSIR devoted considerable research resources with the objective of refining best practice for technology in education programmes. With these seeds of a concept, the strands of an emerging strategy were drawn together by the D G Murray Trust who wanted to question how to position play and creativity at the heart of Foundation Phase learning and whether play-based, exploratory and individualised, self-driven learning could work in a South African context aided by the effective use of innovative technologies. Hence the project, Learning Gains through Play was conceived.

1.3. Focus and Purpose of Learning Gains through Play Project

The focus of the Learning Gains through Play project was to:

- employ new and innovative teaching strategies and pedagogies which promote learner-centred activities;
- involve the use of technology in the classroom; and
- facilitate meaningful learning through play.

The purpose of the Learning Gains through Play project was to transform learning environments and to change teaching practice in the Foundation Phase grades of the project schools. The ultimate outcome was that learners were equipped with foundational skills and attitudes for future academic success. Learning Gains through Play was undertaken as a research project with the intention that should findings support the value of integrating technology for learning through play, this model could be scaled up to include all South African primary schools.

2. CHAPTER TWO – Learning Gains through Play Project Design

2.1 Project Sample Schools

Ten schools were selected from two provinces, five from KwaZulu-Natal and five from the Western Cape. The KwaZulu-Natal schools were all situated in the Howick circuit and comprised two town centre schools, a township school and two farm schools. The Western Cape schools were all managed by the Metropole East District which extends from Khayelitsha to Gordon's Bay. The Western Cape sample comprised a town centre school, a suburban school, a township school and two informal settlement schools. South Africa's schools are divided into five categories or "quintiles" according to their poverty ranking. The poorest schools are included in Quintile 1 and the least poor in Quintile 5. Project schools' quintile rankings ranged from 1 to 5. The language of learning and teaching (LoLT) varied between schools with most schools using isiZulu and isiXhosa. Two of the Western Cape schools were dual-medium, running separate English and Afrikaans streams. One KZN school used English as the LoLT but the home language of learners in that school was almost exclusively isiZulu.

Schools have been assigned codes to protect their anonymity and that of their management staff, teachers and learners.

School A1

This small primary school is a government multi-grade farm school, situated on a Department of Agriculture estate in the village where most of the estate farm labourers live. The school has a Quintile 2 ranking. The principal at the start of the project had been at the school for many years but left the school during the second year of the project. This created disruption among the staff. The staff is very small, comprising five in total. Grade R and Grade 1 teachers teach solitary grades but for the other staff members, Grade 2 and 3 are combined in one class, Grade 4 and 5 are combined in another class and Grade 6 and 7 are combined in a single class. Classes contain small numbers of learners (less than 20) and LoLT is isiZulu in the Foundation Phase.



Figure 1: School A1 and Environs

School A2

This is a large school near the taxi rank of the town centre. It had mistakenly been classified as a Quintile 4 school due to its proximity to tar roads and the town centre. The principal retired before the project finished and a temporary appointment was made in the interim. Classes were large (in excess of 30 in Grade R and in excess of 40 in Grade 1) and LoLT is isiZulu in the Foundation Phase



Figure 2: School A2 and Environs

School A3

This is a large government school in the township which has been ranked Quintile 2 or 3 and classified as a 'Full Service' school. This means that the school should be able to provide for learners' special needs. Unfortunately while a special building was constructed for this purpose, no special needs staff (such as psychologist, occupational therapist etc.) were appointed. As the KZN education department presented the 'full service' to the community, the school struggles with high numbers of learners with learning difficulties as well as health, psychological and behavioural problems. Classes are large with more than 40 learners in both Grade R and Grade 1 classes and LoLT is isiZulu.



Figure 3: School A3 and Environs

School A4

This is an independent school established by the Methodist Church that provides education to young children from disadvantaged backgrounds in the centre of town. The management is applying to become a Section 14 – government school on church land. Most of the children come from informal settlements around the outskirts of the town and are learning in English despite their home language being isiZulu.



Figure 4: School A4 and Environs

School A5

This is a Section 14 remote farm school with a Quintile 1 or 2 ranking. At the start of the project there were three staff members: one teaching Grade R, one teaching Grades 1-3 and the principal teaching Grades 4-7. The principal left during the project and was not replaced by the time the project ended. The school was operating with only two members of staff. Classes were small with single-digit numbers of learners representing a grade and LoLT is isiZulu.



Figure 5: School A5 and Environs

School B1

This school borders an informal settlement alongside the N2 highway between Somerset West and Strand. With a Quintile 3 ranking, the school is situated on a very small campus and comprises only prefab buildings, and yet provides for over a thousand primary school learners. It is within a very impoverished community and the learners are reliant on the school's feeding scheme. The principal maintains a high profile around the school and visibly monitors staff and learners. Teams of learners clean up the litter after break time under his supervision. Classes are large (in excess of 40 learners) and LoLT is isiXhosa. There are no Grade R classes and there are a noticeable number of learners from other African countries such as Malawi, Zimbabwe and the DRC.



Figure 6: School B1 and Environs

School B2

This is a Quintile 3 school in the township of Khayelitsha. While it comprises brick buildings, these are in a state of decay. The Grade R prefab classroom is in better condition than the rest of the school. There is often litter outside the classrooms. The principal does not appear to leave his office often and the staff shared their demotivation with the LGP team. Classes are very large (50 learners in Grade 1 classes). When conducting assessments, learners did

not have pencils and the teacher had to borrow from other learners in other classes. LoLT is in isiXhosa.



Figure 7: School B2 and Environs

School B3

This is also a Quintile 3 school alongside the N2 between Somerset West and Strand. It services the same poor community as School B1. However, learners from other African countries were less noticeable here. Also an entirely prefab school, this school has larger grounds than School B1 but it is plagued with flooding right up to the classroom entrances. The principal is dynamic and has a long time professional relationship with her deputy which makes them a formidable team. Staff are motivated and proud of their activities. There is a great sense of purpose and an optimism at this school.



Figure 8: School B3 and Environs

School B4

This is a very old school on church grounds. It is ranked as a Quintile 5 school but this is in dispute with the education department. The building are old and dilapidated. Some of the staff renovate and decorate their classrooms at their own expense. The school is situated in the heart of Somerset West and has no sports fields as expansion has been impossible due to

its location. Children walk a fair distance to use the sports facilities of the nearest high school. The learners are predominantly so-called Coloured children for whom Afrikaans is their home language. The school offers two language streams for English and Afrikaans. Many of the English classes have learners for whom English is not their home language. There are no Grade R classes. The principal has been at the school for a long time and is very dedicated. Many staff have also been there for a long time. It appears as if it is not an easy environment for a new teacher to move into although with the advanced age of many teachers there are a number of young teachers joining the staff.



Figure 9: School B4 and Environs

School B5

This Quintile 4 school is situated in a so-called Coloured formal settlement across the road from a traditionally white suburb and in walking distance of a large informal settlement with a large proportion of migrants to the Western Cape. The very dedicated principal retired during the project and was replaced by a much younger person. The school appears to be well managed with a strong SMT team. Teachers are motivated and enthusiastic. Classes of learners are racially mixed with three streams, all using Afrikaans as the LoLT. Classes generally comprise less than 40 learners and a high level of discipline is evident in the school.



Figure 10: School B5 and Environs

2.2 Control Sample

Two control schools were selected, each in close proximity to the projects schools of each province. The KZN school is in an environment that most closely resembles project School A3 and is ranked at Quintile 3. The Western Cape school is in an environment similar to project School B5 but has language similarities to project school B4. The control schools received no inputs from the LGP project at all. The only LGP activities were the assessment of the learners to compare these results with those measured in the project schools.



Figure 11: Western Cape Control School and KwaZulu-Natal Control School

2.3 Learning Gains through Play Project Inputs

Project inputs were threefold:

1. **Technology** – Each teacher received a 10” Android tablet which they were encouraged to use both personally at home and professionally in their classrooms. Connectivity was provided for each school by installing a router with data provided by the project, loaded by SchoolNet on a regular basis. Each school received a bank of 7” Intel tablets in a specially customised, protective, charging-enabled mobile box. Each learner tablet was preloaded with educational apps and further carefully selected recommended apps were shared with all of the teachers. Each school received an Xbox Kinect console, donated by Microsoft with a data-projector built into a protective mobile box, specifically designed by SchoolNet’s Themba Mabaso. The design facilitated the use of the Xbox and the insertion of DVDs without learners having access to interfere with other peripherals.



Figure 12: Using the Xbox Kinect

A lightweight tray was included in the box for the young learners to easily carry 25 tablets to their classroom. Xbox games were provided, many donated by Microsoft South Africa and later in the project, additional Xbox consoles were provided to 8 schools who had been using the technology effectively. Large-screen televisions were then donated to all schools by Samsung South Africa to optimize Xbox use. Hands-on technical support was provided to the schools by the project throughout the three years for all the donated devices. It was particularly important to ensure that all equipment was in good working order at the end of the project so that its effectiveness could be sustained.

2. **Teacher Professional Development** – All Grade R and Grade 1 teachers from the ten project schools in both provinces attended clustered training sessions at central venues. There were 53 teachers, 30 in the Western Cape and 23 in the KwaZulu-Natal. Initially they completed the ICT4RED Teacher Professional Development with Tablets Course. This course covered new and innovative teaching strategies for embedding the use of technology in classroom teaching and learning. Modules included Jigsaw Cooperative Learning, Story-telling, Role-play, Learning Stations, Mind-mapping, Field Trips, Gallery Walks and Reflective Practice as well as a specially designed Games-Based Learning module specifically focusing on the effective use of the Xbox Kinect. Course materials were supplied in project-specific, hard-backed files but all the professional development content was also made available on the Learning Gains through Play website here: <http://learninggains.schoolnet.org.za/our-courses/> In 2015, teachers completed a customized course with content exploring tablet apps and Xbox games for Foundation Phase development of gross-motor skills, fine-motor skills, visual literacy, emotional literacy, numeracy and oral English language skills. The focus of each workshop was to link the apps and games to the CAPS curriculum and to promote teaching opportunities and stealth learning through the use of the technology. Further workshops were designed to share the learner assessment data with teachers and analysing this in school groups to identify strengths to build on and weaknesses to address. The monitoring data was used to empower teachers to implement data-driven practice in their schools at a classroom

level. Further new content for professional development included the analysis of the Life Skills CAPS requirements, particularly for Physical Education and a particular focus was on the importance of play as it features in CAPS. Workshop dosage was deliberately incremental, allowing for ongoing classroom visits and teacher support from the project team. Later in 2015 a Peer-mentoring Course was added to strengthen the support for the use of technology in the classroom in each school so as to sustain the change after the project has ended. The teacher professional development approach encouraged teachers to create environments where learners discovered and explored concepts and skills. It also promoted an approach that recognised the need for cognitive development, through encouraging thinking, problem-solving, fantasy and creativity and developing ways for learners to be active – physically, cognitively and emotionally – by creating activities that were fun, challenging and relevant to their lives in the real world outside of the classroom.



Figure 13: Professional Development workshops KwaZulu-Natal and Western Cape

3. **Supported School Environment** – From experiences in other projects, the Learning Gains through Play team felt strongly that the teachers required a supportive school environment in which to change their classroom practice and pedagogies as they integrated the use of technology in a play-based learning environment in their classrooms. It was decided that Senior Management Teams should undergo a course in Change Leadership to prepare them for the introduction of the technologies to their schools. The Change Leadership course modelled the same pedagogies as advocated in the teacher professional development course but also addressed issues such as distributed decision-making and shared vision. Authentic case-scenarios were provided which tackle practical problems that consistently arise in technology in schools interventions. These case-studies, in turn, modelled collaborative problem-solving strategies including peer-coaching. Throughout the project, principals were encouraged to reflect on, monitor, evaluate and communicate about what is happening in their schools. In the Western Cape, the education department E-Learning district officials were actively involved in the LGP project, participating in the professional development workshops and providing additional technical and educational support to the teachers in their schools.



Figure 14: Change Leadership for ICT Integration workshops KwaZulu-Natal and Western Cape

2.4 Learning Gains through Play – Theory of Change

Facilitated by DGMT, the Learning Gains through Play team took on the assistance of an independent researcher and Theory of Change expert to finalise the project and evaluation plan. The project purpose was dissected, the activities and the outcomes, both long-term and intermediate, were scrutinised and subjected to forwards and backwards mapping. Many more assumptions were found to exist that needed to be made explicit as well as more strictly interrogated, and indicators for every objective needed to be more clearly defined.

The resulting Theory of Change enabled the LGP team to clearly articulate:

- the problem being addressed;
- the long-term goal
- the pathway to achieving that long-term goal;
- how to determine success (the indicators and when and how these would be measured);
- what would actually be done and what resources were required to achieve the early and intermediate outcomes (activities, interventions, resources);
- the relationships between the problem and causes (the assumptions underpinning the pathway of change)

The resultant Theory of Change is presented on the following page.

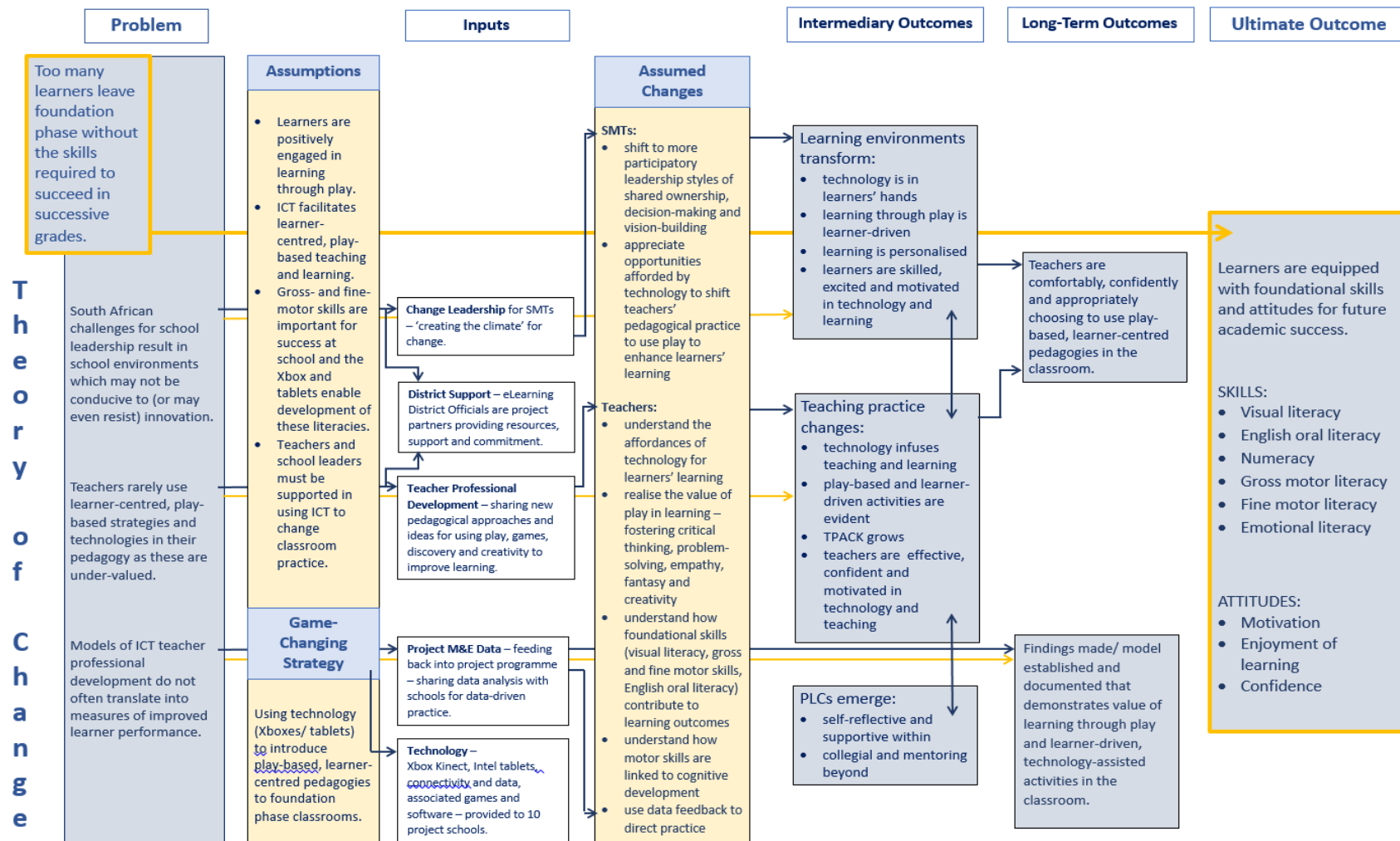


Figure 15: Learning Gains through Play Theory of Change

2.5 Project Timeline

Here below is a sample of implementation planning – the Year Plan for 2015:

Table 1. Learning Gains through Play Implementation Plan Sample

3. CHAPTER THREE – Evaluation Methodology

3.1 Methods Approach

The Learning Gains through Play project involved the implementation of an innovative programme model and therefore, content and some processes were adapted over the course of the three years that the project unfolded. The evaluation followed a similarly developmental approach. We tracked and analysed data as the project developed, documenting, interpreting and sharing the observations and assessments as we progressed. Schools expressed appreciation of being included in the analysis of the data of their own learner performances and the opportunity to workshop strategies for improvements. A mixed-methods approach was taken with quantitative data collected from learners in both project and control schools. Quantitative and qualitative data was collected from teachers involved in the project schools. Project and control schools were not randomly chosen but allocated by the education district officials after request.

As already mentioned, the project included ten project schools – five in the Western Cape and five in KwaZulu-Natal. Data was also collected from two control schools, one in each province. These control schools were not provided with any LGP inputs at all. The only activity at these schools was that their learners were assessed in the same manner and at the same time each year as those learners in the project schools. Results from the control schools were compared with the project schools to establish any learning gains achieved by the LGP intervention and its inputs.

3.2 Learner Evaluation

3.2.1 Rationale

The LGP theory of change informed on the design of the evaluation of the Foundation Phase learners participating in the project over the three year duration of the project.

An assumption was made that, as the Xbox Kinect technology utilises gross-motor skills, practised repetition of these and the extension of these skills through game challenges would improve gross-motor skills. Early childhood professionals rate competence in gross-motor skills as “critical for success in kindergarten” (Johnson, Gallagher, Cook, & Wong, 1995). Sibley and Etnier (2003) identified 44 studies that yielded 125 comparisons for analysis indicating that physical activity was significantly related to improved cognition in children. The effect of physical activity was greatest for middle school and young elementary age children. The effect size was largest for tests of perceptual skills, followed by IQ, overall academic achievement, math tests and verbal tests. In fact, a relationship was observed between reading and locomotor (hop, side gallop, vertical jump) skills and a trend was found for a relationship

between Mathematics and object-control (kick, catch, throw) motor skills in both children with learning disabilities and the control group of age-matched typically developing children. A lag in learning correlated with poorer gross-motor skills (Westendorp, Hartman, Houwen, Smith, & Visscher, 2011).

Another LGP assumption was that, not only does the tablet technology utilise fine-motor skills but tablet use introduces new applications of fine-motor skills e.g. pinching, stretching, dragging and that regular, repetitive use of the tablet technology will improve fine-motor skills (Ulreich, 2011). Early childhood professionals also rate competence in fine-motor skills as “critical for success in kindergarten” (Johnson, Gallagher, Cook, & Wong, 1995). Children with strong fine-motor skills demonstrate better mathematics performance at elementary school entry and make greater mathematics gains over the year (Luo, Jose, Huntsinger, & Pigott, 2007) and in fact, information from Foundation Phase fine-motor tasks is useful in identifying children at risk for academic underachievement (Son and Meisels, 2006). This was confirmed when Grissmer, Grimm, Aiyer, Murrah & Steele (2010) provided evidence that fine-motor skills at elementary school entrance strongly predict later achievement in reading and mathematics.

One of the most challenging issues facing teachers is the use of English as the language of teaching and learning (LoLT) in South Africa, a country with eleven official languages where low levels of English language competence characterise many rural primary schools. The Learning Gains through Play project targeted Foundation Phase before mother tongue learners have to adapt to English as the LoLT in Grade 4. 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. Children typically enter school with a wide range of background knowledge and oral language ability, attributable in part to factors such as their experiences in the home and their socio-economic status (SES). Any gap in their academic ability tends to persist or grow throughout their school experience (Fielding, Kerr, & Rosier, 2007; Juel, Biancarosa, Coker, & Deffes, 2003).

In South Africa “learners who speak English as a second-language clearly perform worse on average than their first-language English counterparts” (Van der Berg, Taylor, Gustafsson, Spaul, & Armstrong, 2011). The NEEDU National Report of 2012 (National Education, Evaluation and Development Unit, 2013) notes that many school principals are facing demands from parents to offer English as the Language of Learning and Teaching (LoLT) even though all the learners speak African languages at home. The report makes the recommendation that “schools must make a special effort to improve the proficiency of learners and teachers in both Language of Learning and Teaching (LoLT) and First Additional Language (FAL)” (p.73). It is noted that across the country evaluators encountered the view

that English is the preferred language of instruction for Mathematics from Grade 1 and that some schools are unofficially already adopting this strategy.

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 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."*

According to Krashen, students learning a second language move through five predictable stages: Preproduction, Early Production, Speech Emergence, Intermediate Fluency, and Advanced Fluency (Krashen & Terrell, 1995).

James Paul Gee (a literacy specialist, who in more recent times is known as a gaming expert focusing on the learning principles in video games) proposes that settings which focus on acquisition rather than learning should be stressed if the goal is to help non-mainstream children (low-income, minority children) attain mastery of literacies. In other words, mastery is by subconscious acquisition rather than conscious learning (Gee, 1998). 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.

The enGauge 21st Century Skills report (North Central Regional Educational Laboratory & Metiri Group, 2003) positions visual literacy as one of four key domains of skills essential for academic achievement. Visual literacy requirements in the Foundation Phase CAPS focus on visual perception skills of visual recognition, visual discrimination and visual interpretation. Included in this is visual sequencing and emotion literacy. In *The Use and Mis-use of Language* (Hayakawa, 1967), Paul Wendt discusses the important sense of language control (and self-power) achieved by a youngster intentionally ordering pictures to tell a story. Structuring language visually links to inner ordering of communication and greater development of verbal

literacy. Thus it was decided to assess the following foundational literacies for each learner as they progressed from Grade R to Grade 1 to Grade 2 over the course of the project:

- Gross-motor Skills
- Fine-motor Skills
- Numeracy
- Visual Literacy
- Oral English Communication Skills

Unique assessment tools were designed and baseline data was collected in June to August of 2014 from Grade R and Grade 1 learners at each school. Not all literacies were assessed at all schools. In 2015, Grade R and Grade 1 learners were tested again. The 2014 – Grade R learners became the 2015 – Grade 1 learners and formed the first LGP project cohort. These learners were tested again in 2016 in their Grade 2 year to complete the cohort data. The 2015 – Grade R learners were tested again in 2016 in their Grade 1 year to form the second LGP project cohort.

Table 2. Learner Data Sample

| | 2014 | 2015 | 2016 |
|----------|---|---|---|
| Cohort 1 | Grade R (70-98 LGP learners) (34-57 control learners) | Grade 1 (124-170 LGP learners) (31-64 control learners) | Grade 2 (106-160 LGP learners) (37-66 control learners) |
| Cohort 2 | - | Grade R (82-92 LGP learners) (31-54 control learners) | Grade 1 (82-92 LGP learners) (31-54 control learners) |

Learner numbers varied between the five different foundational literacies due to learner absenteeism as assessments were not all conducted on the same day. The lower numbers of learners are all due to the oral English skills assessments where only isiZulu and isiXhosa home language speakers were assessed. Grade R learner numbers are lower in Cohort 1 than Grade 1 and Grade 2 numbers due to two project schools in the Western Cape which do not provide Grade R teaching. These schools were excluded from Cohort 2 as only a single measurement would be made for Grade 1 learners due to the project concluding in that year and this would not enable any progress to be recorded.

It was expected that there would be improvement from Grade R to Grade 1 to Grade 2 and so assessment tools were progressive for advancing grades. The control data gives an indication of any changes of performance on these assessments for learners not participating in the project. Any further changes have been attributed to the LGP project as learning gains.

3.2.2 Learner Data Collection & Analysis: Gross-motor Skills

Assessment tool design was based on the LGP theory of change, the assumptions about the Xbox Kinect technology's impact on gross-motor skills and the Physical Education requirements of the CAPS curriculum for Foundation Phase. Existing physical proficiency tests for young learners were considered. Similar design choices were made, such as the Test of Gross-motor Development (TGMD-2) which distinguishes between locomotor skills and object-control skills, and the Charlop-Atwell Scale of Motor Coordination in Young Children which further distinguishes between a more objective score of execution and a more subjective score of quality (Charlop and Atwell, 1980). This consideration is aligned with the Department of Basic Education (DBE) Curriculum and Assessment Policy Statements (CAPS) for the Physical Education component of Life Skills in Foundation Phase and in Intermediate Phase where a teacher is required for formal assessment purposes to record achievement against two criteria: learner participation and movement performance. Gross-motor skills were assessed through observing the learners performing specified physical activities. Each activity was demonstrated to the class of learners before testing in the same way each time at each school. Each learner performed each task in front of the assessor. These activities involved body awareness and control, spatial awareness and orientation, static and dynamic balance, laterality, coordination and rhythm.

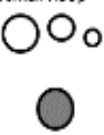
| | DESCRIPTION | EQUIPMENT NEEDED | GRADE R | GRADE 1 | GRADE 2 |
|--|---|---|---|---|---|
| ACTIVITY 1 'Jump and About Face' | Stand with feet together and arms by sides. Jump up off both feet and turnabout in the air to land on both feet simultaneously facing a direction 180° from the starting position. | Space with a flat surface 1 x hoop | Jump 180° to land on both feet in large hoop. | Jump 180° to land on both feet in large hoop. | Jump 180° to land on both feet in medium hoop. |
| ACTIVITY 2 Tiptoe Balancing | Stand with feet together and arms by sides. Rise up on the tiptoes of both feet and balance steadily for a specified time period. | Space with a flat surface 1 x medium hoop | Balancing for 8 seconds. | Balancing for 12 seconds. | Balancing for 16 seconds. |
| ACTIVITY 3 Hopping | Stand with feet together and arms by sides. Hop on one leg regularly and continuously, landing on the same spot for a specified time period. | Space with a flat surface 1 x medium hoop | Hopping for 8 counts in large hoop. | Hopping for 12 counts in large hoop. | Hopping for 16 counts in medium hoop. |
| ACTIVITY 4 'Jumping Jacks' | Stand with feet together and arms by sides. Perform a specified number of 'jumping jacks' continuously. (Straight arms are moved up above head to clap hands together while straight legs are moved out to land feet apart as hands meet; straight arms move down to meet sides while straight legs are moved together for landing at the same time as hands meet sides.) | Space with a flat surface | Performs three jumping jacks. | Performs four jumping jacks. | Performs five jumping jacks. |
| ACTIVITY 5 Catching Beanbags | A beanbag is placed at the end of the seesaw. The end of the seesaw is stamped on to cause the beanbag to move up into the air where it is caught. Activity is performed three times and caught with two hands then repeated three times and caught with only the right hand and then repeated with only the left hand. | 1 x seesaw 1 x beanbag | Up to 3 practice attempts at start. | One practice attempt at start. | No practice at start. |
| ACTIVITY 6 Throwing Beanbags | Stand with feet together in demarcated hoop space. A beanbag is thrown to land in a different demarcated space. Activity is repeated for three different landing spaces. | 3 x beanbags 2 x large hoops 1 x medium hoop 1 x small hoop  | Throwing into three hoops (large, medium and small) within a 2,5m distance. | Throwing into three hoops (large, medium and small) within a 3,5m distance. | Throwing into three hoops (large, medium and small) within a 4,5m distance. |

Figure 16: LGP Gross-motor Skills Assessment Tool

A scoring rubric was used to collect observed and measured achievement of the execution of locomotor movements, the quality of locomotor movements and object-control skills of catching and throwing. Age or grade progression was established through more repetitions and greater distances and durations as shown above.

Practical Physical Proficiency Task Rubric for Grade R

| ACTIVITY | ACTION DESCRIPTION | SKILLS | Performance Level 0 | Performance Level 1 | Performance Level 2 | Performance Level 3 | SCORE |
|----------|--|--|---|---|--|---|--|
| 1 | Performing a 'Jump and About Face' | body awareness spatial orientation | Unable to jump AND/OR turn | Jump but unable to turn past 90° | Jumps and turns past 90° OR past 180° - does not land directly facing the opposite direction | Jumps and lands directly facing the opposite direction (180°) | Execution Measure |
| | | | Unable to do OR arms/feet move first before the body turns AND steps back/overbalances/ falls when landing | Arms/feet move first before the body turns OR steps back/overbalances/ falls when landing | Lands uncomfortably OR with one foot obviously reaching the ground before the other foot | Arms naturally assist turn and lands with both feet securely touching the ground at the same time | Quality Measure |
| 2 | Balancing on tiptoes for 8 seconds | static balance body control | Unable to balance on tiptoes | Balances but very low OR puts heels down before 4 seconds | Balances but low OR puts heels down after 4 seconds | Balances high for 8 seconds without putting heels down | Execution Measure |
| | | | Overbalances/ touches surrounds OR steps down on heels to avoid overbalancing | Moves feet AND/OR shows wobbling on the AND in static balance | Only shows a little wobbling on the OR in first 4 seconds | Stays and stays steady in one place and with no wobbling of any part of body | Quality Measure |
| 3 | Hopping 8 times | dynamic balance rhythm | Unable to hop up and down | Slow, laboured hops without rhythm OR very low OR puts feet down | Basic fluidity with some rhythm OR low rhythmic hops | Rhythmically hops high, with no pauses and without putting feet down | Execution Measure |
| | | | Unable to balance for hopping - overbalances/ touches the floor etc. | Unbalanced hopping with landing spots outside of hop area | Lacks balance but lands repeatedly inside of hop area | Controlled and balanced hopping - reliably landing lightly in one place | Quality Measure |
| 4 | Performing three 'Jumping Jacks' | coordination laterality rhythm | Unable to jump up and down OR only jumps up and down with no lateral movement of limbs | Struggles to begin - unable to find rhythm OR double-bounces OR pauses in between each jump | Moves body to begin OR jumps continuously but lacks rhythm | Starts immediately and performs three fluid, rhythmic jumping jacks without pause | Execution Measure |
| | | | Unable to move arms and legs as required | Arms raised and lowered from shoulder height OR legs moved out and back together | Arms raised and lowered to sides AND legs moved out and back but lacking some synchrony | Arms clapped above head and at sides AND legs moved out and back together in synchrony | Quality Measure |
| 5 | Catching beanbags from seesaw launch (3 repetitions with each hand set) | co-ordination spatial awareness laterality | Two hands - unable to execute - no catches One hand (right) - unable to execute - no catches One hand (left) - unable to execute - no catches | Two hands - one catch Right hand - one catch Left hand - one catch | Two hands - two catches Right hand - two catches Left hand - two catches | Two hands - three catches Right hand - three catches Left hand - three catches | First Measure Second Measure Third Measure |
| 6 | Throwing beanbags into 3 demarcated spaces (repeated with each hand set) | coordination spatial awareness laterality | Two hands - unable to execute - no 'goals' One hand (right) - unable to execute - no 'goals' One hand (left) - unable to execute - no 'goals' | Two hands - one 'goal' One hand (right) - one 'goal' One hand (left) - one 'goal' | Two hands - two 'goals' One hand (right) - two 'goals' One hand (left) - two 'goals' | Two hands - three 'goals' One hand (right) - three 'goals' One hand (left) - three 'goals' | First Measure Second Measure Third Measure |

Figure 17: LGP Gross-motor Skills Scoring Rubric for Grade R

Practical Physical Proficiency Task Rubric for Grade 1

| ACTIVITY | ACTION DESCRIPTION | SKILLS | Performance Level 0 | Performance Level 1 | Performance Level 2 | Performance Level 3 | SCORE |
|----------|--|--|---|---|--|---|--|
| 1 | Performing a 'Jump and About Face' | body awareness spatial orientation | Unable to jump AND/OR turn | Jump but unable to turn past 90° | Jumps and turns past 90° OR past 180° - does not land directly facing the opposite direction | Jumps and lands directly facing the opposite direction (180°) | Execution Measure |
| | | | Unable to do OR arms/feet move first before the body turns AND steps back/overbalances/ falls when landing | Arms/feet move first before the body turns OR steps back/overbalances/ falls when landing | Lands uncomfortably OR with one foot obviously reaching the ground before the other foot | Arms naturally assist turn and lands with both feet securely touching the ground at the same time | Quality Measure |
| 2 | Balancing on tiptoes for 12 seconds | static balance body control | Unable to balance on tiptoes | Balances but very low OR puts heels down before 6 seconds | Balances but low OR puts heels down after 6 seconds | Balances high for 12 seconds without putting heels down | Execution Measure |
| | | | Overbalances/ touches surrounds OR steps down on heels to avoid overbalancing | Moves feet AND/OR shows wobbling on the AND in static balance | Only shows a little wobbling on the OR in first 6 seconds | Stays and stays steady in one place and with no wobbling of any part of body | Quality Measure |
| 3 | Hopping 12 times | dynamic balance rhythm | Unable to hop up and down | Slow, laboured hops without rhythm OR very low OR puts feet down | Basic fluidity with some rhythm OR low rhythmic hops | Rhythmically hops high, with no pauses and without putting feet down | Execution Measure |
| | | | Unable to balance for hopping - overbalances/ touches the floor etc. | Unbalanced hopping with landing spots outside of hop area | Lacks balance but lands repeatedly inside of hop area | Controlled and balanced hopping - reliably landing lightly in one place | Quality Measure |
| 4 | Performing four 'Jumping Jacks' | coordination laterality rhythm | Unable to jump up and down OR only jumps up and down with no lateral movement of limbs | Struggles to begin - unable to find rhythm OR double-bounces OR pauses in between each jump | Moves body to begin OR jumps continuously but lacks rhythm | Starts immediately and performs four fluid, rhythmic jumping jacks without pause | Execution Measure |
| | | | Unable to move arms and legs as required | Arms raised and lowered from shoulder height OR legs moved out and back together | Arms raised and lowered to sides AND legs moved out and back but lacking some synchrony | Arms clapped above head and at sides AND legs moved out and back together in synchrony | Quality Measure |
| 5 | Catching beanbags from seesaw-launch (3 repetitions with each hand set) | co-ordination spatial awareness laterality | Two hands - unable to execute - no catches One hand (right) - unable to execute - no catches One hand (left) - unable to execute - no catches | Two hands - one catch Right hand - one catch Left hand - one catch | Two hands - two catches Right hand - two catches Left hand - two catches | Two hands - three catches Right hand - three catches Left hand - three catches | First Measure Second Measure Third Measure |
| 6 | Throwing beanbags into 3 demarcated spaces (repeated with each hand set) | coordination spatial awareness laterality | Two hands - unable to execute - no 'goals' One hand (right) - unable to execute - no 'goals' One hand (left) - unable to execute - no 'goals' | Two hands - one 'goal' One hand (right) - one 'goal' One hand (left) - one 'goal' | Two hands - two 'goals' One hand (right) - two 'goals' One hand (left) - two 'goals' | Two hands - three 'goals' One hand (right) - three 'goals' One hand (left) - three 'goals' | First Measure Second Measure Third Measure |

Figure 18: LGP Gross-motor Skills Scoring Rubric for Grade 1

Practical Physical Proficiency Task Rubric for Grade 2

| ACTIVITY | ACTION DESCRIPTION | SKILLS | Performance Level 0 | Performance Level 1 | Performance Level 2 | Performance Level 3 | SCORE |
|----------|--|--|--|---|--|---|-------------------|
| 1 | Performing a 'Jump and About Face' | body awareness spatial orientation | Unable to jump AND/OR turn | Jumps but unable to turn past 90° | Jumps and turns past 90° OR past 180° - does not land directly facing the opposite direction | Jumps and lands directly facing the opposite direction (180°) | Execution Measure |
| | | | Unable to do OR arms/feet move first before the body turns AND steps back/overbalances/ falls when landing | Arms/feet move first before the body turns OR steps back/overbalances/ falls when landing | Lands uncomfortably OR with one foot obviously reaching the ground before the other foot | Arms naturally assist turn and lands with both feet securely touching the ground at the same time | Quality Measure |
| | | | Unable to balance on tiptoes | Balances but very low OR puts heels down before 8 seconds | Balances but low OR puts heels down after 8 seconds | Balances high for 16 seconds without putting heels down | Execution Measure |
| 2 | Balancing on tiptoes for 16 seconds | static balance body control | Overbalances/ touches surrounds OR steps down on heels to avoid overbalancing | Moves feet AND/OR wobbles on rise AND in static balance | Only shows a little wobbling on rise OR in first 8 seconds | Rises and stays steady in one place and with no wobbling of any part of body | Quality Measure |
| | | | Unable to hop up and down | Slow, laboured hops without rhythm OR very low OR puts foot down | Basic fluidity with some rhythm OR low rhythmic hops OR unable to complete | Rhythmically hops high, with no pauses and without putting foot down | Execution Measure |
| | | | Unable to balance for hopping - overbalances/ touches the floor etc. | Unbalanced hopping with landing spots outside of hop area | Lacks balance but lands repeatedly inside of hop area | Controlled and balanced hopping - reliably landing lightly in one place | Quality Measure |
| 3 | Hopping 16 times | dynamic balance rhythm | Unable to jump up and down OR only jumps up and down with no lateral movement of limbs | Struggles to begin - unable to find rhythm OR double-bounces OR pauses in between each jump | Moves body to begin OR jumps continuously but lacks rhythm OR struggles to complete five | Starts immediately and performs five fluid, rhythmic jumping jacks without pause | Execution Measure |
| | | | Unable to move arms and legs as required | Arms raised and lowered from shoulder height OR legs moved out and back together | Arms raised and lowered to sides AND legs moved out and back but lacking some synchrony | Arms dipped above head and at sides AND legs moved out and back together in synchrony | Quality Measure |
| | | | Two hands - unable to execute - no catches | Two hands - one catch | Two hands - two catches | Two hands - three catches | First Measure |
| 4 | Performing five 'Jumping Jacks' | coordination laterality rhythm | One hand (right) - unable to execute - no catches | Right hand - one catch | Right hand - two catches | Right hand - three catches | Second Measure |
| | | | One hand (left) - unable to execute - no catches | Left hand - one catch | Left hand - two catches | Left hand - three catches | Third Measure |
| | | | Two hands - unable to execute - no 'goals' | Two hands - one 'goal' | Two hands - two 'goals' | Two hands - three 'goals' | First Measure |
| 5 | Catching beanbags from seesaw-launch (3 repetitions with each hand set) | co-ordination spatial awareness laterality | One hand (right) - unable to execute - no 'goals' | One hand (right) - one 'goal' | One hand (right) - two 'goals' | One hand (right) - three 'goals' | Second Measure |
| | | | One hand (left) - unable to execute - no 'goals' | One hand (left) - one 'goal' | One hand (left) - two 'goals' | One hand (left) - three 'goals' | Third Measure |
| | | | Two hands - unable to execute - no 'goals' | Two hands - one 'goal' | Two hands - two 'goals' | Two hands - three 'goals' | First Measure |
| 6 | Throwing beanbags into 3 demarcated spaces (repeated with each hand set) | coordination spatial awareness laterality | One hand (right) - unable to execute - no 'goals' | One hand (right) - one 'goal' | One hand (right) - two 'goals' | One hand (right) - three 'goals' | Second Measure |
| | | | One hand (left) - unable to execute - no 'goals' | One hand (left) - one 'goal' | One hand (left) - two 'goals' | One hand (left) - three 'goals' | Third Measure |
| | | | Two hands - unable to execute - no 'goals' | Two hands - one 'goal' | Two hands - two 'goals' | Two hands - three 'goals' | First Measure |

Figure 19: LGP Gross-motor Skills Scoring Rubric for Grade 2

An identified weakness of the test had been found in the catching of beanbags. To standardize the launch of the beanbags, a commercial seesaw-launch (made out of a wooden plank) was used. Thus there is no greater level of difficulty presented for a Grade 1 or Grade 2 learner compared to a Grade R learner (other than reduced opportunity to practice before measuring – Grade R learners had three practice tries, Grade 1 learners had one practice try and Grade 2 learners had no practice opportunity). It was clear, that this task was easily mastered by most Grade 1 and Grade 2 learners. Fortunately results of the project schools with the control schools can still inform of the level of mastery but it would have been better to have customized longer seesaw-launches for the Grade 1 and Grade 2 test tasks.

Analysis of Gross-motor Skills Results

Rubric scores were collected in MS Excel and an average percentage (out of a total score of 42) calculated for each learner in each school, each province and an overall average for all project schools. The same treatment was made to the control school data. Overall project school data was compared to control school data and this was shared with the project schools and used to evaluate the impact of the LGP project.

3.2.3 Learner Data Collection & Analysis: Fine-motor Skills

Assessment tool design was based on the LGP theory of change, the assumptions about the tablet and Xbox technology's impact on fine-motor skills and the writing requirements in the Home Language CAPS curriculum. In the CAPS for Foundation Phase Language, the importance of handwriting can be seen by the fact that it is only from Grade 2 on, that the time allocated to the writing process and the products of writing exceed that of the time allocated for the development of the fine-motor skills required for handwriting.

As is the case with many fine-motor skills tests, the LGP assessment involves the manipulation of a writing instrument. It is expected that much time is spent in all Foundation Phase classes practicing the fine-motor skills required for handwriting. The LGP team were interested to see if the new fine-motor skills required for successful tablet use (such as pinching, stretching, pin-pointing, dragging and tracking) could improve fine-motor skills as evidenced in handwriting. Grade-specific fine-motor skills tests and rubrics were developed for LGP use.

The Fine-motor Skills Assessment Tools

The Fine-motor Skills Test was written by each learner under test conditions. Instructions were given verbally in English and in isiXhosa and Afrikaans in Western Cape schools and in isiZulu in KZN schools.

GRADE R – Fine-motor Skills Test

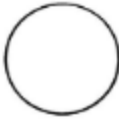











| | | |
|---|---|---|
| Q.1 – Colour in the shape: | | |
|  |  |  |
| Q.2 – Trace the line: | | |
|  |  |  |
| Q.3 – Trace the letter: | | |
|  |  |  |
| Q.4 – Copy and write the letter: | | |
|  |  |  |
| COMMENTS: | | |

Figure 20: LGP Fine-motor Skills Assessment Tool for Grade R

Each test was scored with the following rubric:


GRADE R – Fine-motor Skills Rubric

| Assessment Criteria | Performance Level 0 | Performance Level 1 | Performance Level 2 | Performance Level 3 |
|---|------------------------------------|---|--|--|
| Demonstrating execution of fine motor skills through colouring (focus is on confinement in space) Q.1 | No recognisable response recorded. | Some shapes are not recognisably coloured/ coloured area doesn't resemble shape/ significantly over/ short of boundaries. | Shapes are recognisably coloured and mostly within the boundaries. | All shapes are completely coloured in. Colour placement is neat and precise with no extension beyond/ shortness before the boundaries. |
| Demonstrating quality of fine motor skills through colouring (focus is on consistency of colour) Q.1 | No recognisable response recorded. | Colouring is crude/ irregular/ uneven/ Coverage is thin or so thick as to obscure boundaries (see above). | Colouring is sketchy/ with spaces between strokes/visible unintended cross-strokes. Colour coverage appears hasty/ careless. | Colouring is precise/ even/ condensed/ neatly confined/ intentionally textured. Shows expert use of available tools. |
| Demonstrating execution of fine motor skills through tracing (focus is on matching the line) Q.2, Q.3 | No recognisable response recorded. | Some attempt made to roughly match lines but mostly drawn line is separate from tracing guide. Patterns difficult to distinguish. | Tracks and letters are recognisably traced but execution appears hasty/ rough/ careless. Some deviations more than twice line width. | All tracks and letters closely match tracing guide. Precision and detail in execution is evident. |
| Demonstrating quality of fine motor skills through tracing (focus is on nature of the drawn line) Q.2, Q.3 | No recognisable response recorded. | Tracing lines are multiple/ broken/ jagged/ over-enforced/ thick and unsteady. | Tracing lines are single and generally even but may show some wobbling/ unsteadiness. | Tracing lines are single, continuous and precise/ steady/ neatly matching the guidelines throughout. |
| Demonstrating execution of fine motor skills through copying and writing letters (focus is on the form of the written letters) Q.4 | No recognisable response recorded. | Some letters are not recognisable due to issues of orientation (reversals or inversions e.g. p and b or q) or proportion (e.g. a and d, n and r). | Letters are recognisable but issues of proportion or form make this recognition challenging. | All letters are copied and written precisely with correct form and proportion. |
| Demonstrating quality of fine motor skills through copying and writing letters (focus is on the quality of the writing) Q.4 | No recognisable response recorded. | Produces multiple/ broken/ coarse and unsteady lines. | Produces single lines, generally even but may show some wobbling/ unsteadiness. | Produces precise, single, continuous lines, forming neatly written copies of the letters. |

Figure 21: LGP Fine-motor Skills Scoring Rubric for Grade R

GRADE 1 Fine-motor Skills Test

Q.1 – Copy and complete the line patterns below:



Q.2 – Copy and write the letter:

| | | |
|---|---|---|
| b | e | g |
|---|---|---|

Q.3 – Copy and write the word:

| | | |
|----|-----|-----|
| in | jug | hug |
|----|-----|-----|

Q.4 – Copy and write the sentence:

The quick brown fox jumps over the lazy dog.

COMMENTS:

Figure 22 LGP Fine-motor Skills Assessment Tool for Grade 1

Each test was scored with the following rubric:


GRADE 1 – Fine-motor Skills Rubric

| Assessment Criteria | Performance Level 0 | Performance Level 1 | Performance Level 2 | Performance Level 3 |
|---|------------------------------------|---|---|---|
| Demonstrating execution of fine motor skills through drawing lines (focus is on matching pattern) Q.1 | No recognisable response recorded. | Line pattern tracing or writing barely resembles pattern/ can't distinguish between the two patterns. | Different patterns are recognisable and distinguishable but are too compressed/ too extended/ irregular. | Both patterns are completely reproduced in shape, line form and proportion. Detail in execution is evident. |
| Demonstrating quality of fine motor skills through drawing lines (focus is on form of line within guidelines) Q.1 | No recognisable response recorded. | Lines are multiple/ irregular/ unsteady/ lack confinement within guidelines/ extend beyond guidelines. | Lines are single but may be sketchy/ unsteady. Generally confined within guidelines. | Lines are complete, single, regular, steady and neatly confined within, and extending to, the guidelines. |
| Demonstrating execution of fine motor skills through writing letters and letters in words (focus is on the form of the written letters) Q.2; Q.3 | No recognisable response recorded. | Some letters are not recognisable due to issues of orientation (reversals or inversions e.g. b and d or p, n and u) or proportion (e.g. h and n). | Letters are recognisably written alone and in words but issues of proportion or form make this recognition challenging. | All letters are copied and written precisely with correct form and proportion. |
| Demonstrating quality of fine motor skills through writing letters (focus is on the quality of the writing to form a word) Q.2; Q.3 | No recognisable response recorded. | Letters are coarsely written with multiple/ broken/ irregular/ unsteady lines. | Letters composed of single lines, generally even but may show some wobbling/ unsteadiness. | Letters are formed by precise, single, smooth lines, resulting in neatly written, correct copies of the letters. |
| Demonstrating execution of fine motor skills through writing words in a sentence (focus is on the completion of the sentence) Q.3; Q.4 | No recognisable response recorded. | Significant words are not recognisably written/ significant words or letters missing. | Single, minor word/ letter/ error is evident. | All words are clearly written to form a complete and legible sentence. |
| Demonstrating quality of fine motor skills through writing words (focus is on the quality of the writing to form a sentence) Q.3; Q.4 | No recognisable response recorded. | Words are coarsely written with issues of spatial relationships inhibiting word recognition/ sentence breaks cut through words. | Words are distinct and recognisable in spatial relationships but incorrect form (shapes of words) exist due to horizontal placement of letters. | Words are precisely written and sentence is clear, with correct and accurate form and spatial relationships of letters and words. |

Figure 23: LGP Fine-motor Skills Scoring Rubric for Grade 1

GRADE 2 – Fine-motor Skills Test

Q.1 – Copy and complete the line patterns below:



Q.2 – Copy and write the word:

bell snug Friday

Q.3 – Copy and write the sentence:

The quick brown fox jumps over the lazy dog.

Q.4 – Write your answers in the spaces below:

My name is

I am years old.

I live with

COMMENTS:

Figure 24: LGP Fine-motor Skills Assessment Tool for Grade 2

Each test was scored with the following rubric:

GRADE 2 – Fine-motor Skills Rubric

| Assessment Criteria | Performance Level 0 | Performance Level 1 | Performance Level 2 | Performance Level 3 |
|---|------------------------------------|---|---|---|
| Demonstrating execution of fine motor skills through drawing lines (focus is on matching pattern) Q.1 | No recognisable response recorded. | Line pattern tracing or writing barely resembles pattern/ can't distinguish between the two patterns. | Different patterns are recognisable and distinguishable but are too compressed/ too extended/ irregular. | Both patterns are completely reproduced in shape, line form and proportion. Detail in execution is evident. |
| Demonstrating quality of fine motor skills through drawing lines (focus is on form of line within guidelines) Q.1 | No recognisable response recorded. | Lines are multiple/ irregular/ unsteady/ lack confinement within guidelines/ extend beyond guidelines. | Lines are single but may be sketchy/ unsteady. Generally confined within guidelines. | Lines are complete, single, regular, steady and neatly confined within, and extending to, the guidelines. |
| Demonstrating execution of fine motor skills through writing letters and letters in words (focus is on the form of the written letters) Q.2; Q.3; Q.4 | No recognisable response recorded. | Some letters are not recognisable due to issues of orientation (reversals or inversions e.g. b and d; n and u; g and y) or proportion (e.g. d and a). | Letters are recognisably written alone and in words but issues of proportion or form make this recognition challenging. | All letters are copied and written precisely with correct form and proportion. |
| Demonstrating quality of fine motor skills through writing letters (focus is on the quality of the writing to form a word) Q.2; Q.3; Q.4 | No recognisable response recorded. | Letters are coarsely written with multiple/ broken/ irregular/ unsteady lines. | Letters composed of single lines, generally even but may show some wobbling/ unsteadiness. | Letters are formed by precise, single, smooth lines, resulting in neatly written, correct copies of the letters. |
| Demonstrating execution of fine motor skills through writing words in a sentence (focus is on the completion of the sentence) Q.3; Q.4 | No recognisable response recorded. | Significant words are not recognisably written/ significant words or letters missing. | Single, minor word/ letter/ error is evident. | All words are clearly written to form a complete and legible sentence. |
| Demonstrating quality of fine motor skills through writing words in a sentence (focus is on the quality and placement of words) Q.3; Q.4 | No recognisable response recorded. | Words are coarsely written with issues of spatial relationships inhibiting word recognition/ sentence breaks cut through words. | Words are distinct and recognisable in spatial relationships but incorrect form (shapes of words) exist due to horizontal placement of letters. | Words are precisely written and sentence is clear, with correct and accurate form and spatial relationships of letters and words. |

Figure 25: LGP Fine-motor Skills Scoring Rubric for Grade 2

Analysis of Fine-motor Skills Results

Rubric scores were collected in MS Excel and an average percentage (out of a total score of 18) calculated for each learner in each school, each province and an overall average for all project schools. The same treatment was made to the control school data. Overall project school data was compared to control school data and this was shared with the project schools and used to evaluate the impact of the LGP project.


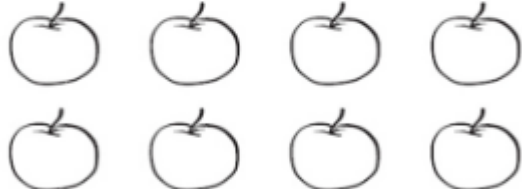
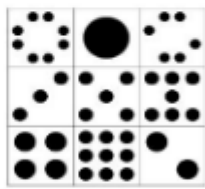
3.2.4 Learner Data Collection & Analysis: Numeracy Skills

Assessment tool design was based on the LGP theory of change, the assumptions about the Xbox Kinect and tablet technology's impact on numeracy skills and the Mathematics requirements of the CAPS curriculum for Foundation Phase. The numeracy tests were pencil and paper tests. Tests were grade-specific and focused on number concept, number operations and communicating with number symbols. Responses were assessed using rubrics.

The Numeracy Skills Assessment Tools

The Numeracy Skills Test was written by each learner under test conditions. Instructions were given verbally in English and in isiXhosa and Afrikaans in Western Cape schools and in isiZulu in KZN schools. Learner responses were scored on rubrics.

GRADE R – Numeracy Skills Test

| | | |
|---|--|---|
| Q.1 – How many apples?  | | Write down the number. <div style="border: 1px solid black; width: 80px; height: 50px; margin: 10px auto;"></div> |
| Q.2 – Look at these apples below. Colour in only 3 apples.  | Q.3 – Look at the boxes of dots. Colour in the box with 5 dots.  | |
| Q.4 – Write down the numbers ONE to FIVE in the boxes below. <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; width: 60px; height: 40px; margin: 5px;"></div> <div style="border: 1px solid black; width: 60px; height: 40px; margin: 5px;"></div> <div style="border: 1px solid black; width: 60px; height: 40px; margin: 5px;"></div> <div style="border: 1px solid black; width: 60px; height: 40px; margin: 5px;"></div> <div style="border: 1px solid black; width: 60px; height: 40px; margin: 5px;"></div> </div> | | |

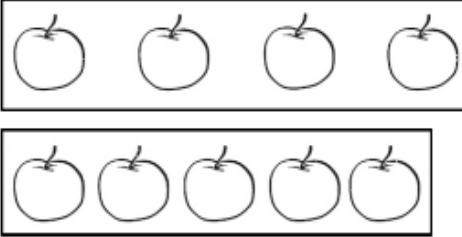
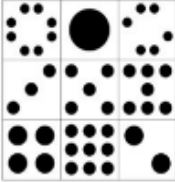
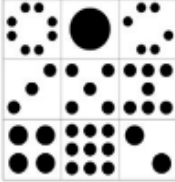

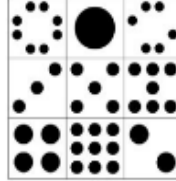
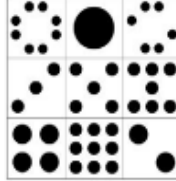
| | | |
|--|--|--|
| <p>Q.5 – Colour in the box which shows MORE apples.</p>  | <p>Q.6 – Look at the boxes of dots. Colour in the box with the least dots (least means smallest number).</p>  | <p>Q.7 – Look at the boxes of dots. Colour in the box with the most dots (most means greatest number).</p>  |
| <p>Q.8 – Look at the apples below. How many apples will be left if I eat 3 apples? Write down the answer.</p>  <div style="border: 1px solid black; width: 80px; height: 50px; float: right; margin-top: 10px;"></div> | | |
| <p>Q.9 – Look at the boxes of dots. Colour in the box with 2 MORE THAN 5 dots.</p>  | <p>Q.10 – Look at the boxes of dots. Colour in the box with 1 LESS THAN 5 dots.</p>  | |


Figure 26: LGP Numeracy Skills Assessment Tool for Grade R

GRADE R – Numeracy Skills Assessment Rubric

| Assessment Criteria | Performance Level 0 | Performance Level 1 | Performance Level 2 | Performance Level 3 |
|--|---|---|--|---|
| Using visual representations to count, identify and represent numbers Q.1; Q.2; Q.3 | No recognisable response. (no responses correct) | Can count or identify or represent a number only. (one response correct) | Can count and identify or represent numbers using visual representations. (two responses correct) | Correctly counts, identifies and represents all numbers using visual representations. (all three responses correct) |
| Using visual representations to compare numbers Q.5; Q.6; Q.7 | No recognisable response. (no responses correct) | Limited success in comparing sets of numbers. (one response correct) | Mostly can compare sets of numbers. (two responses correct) | Correctly compares all different representations of sets of numbers. (all three responses correct) |
| Using visual representations to interpret and work with numbers (early operations) Q.8; Q.9; Q.10 | No recognisable response. (no responses correct) | Can interpret or work with simple visual representations of numbers. (one response correct) | Can interpret and work with simple visual representations of numbers. (two responses correct) | Correctly interprets and works with all visual representations of numbers. (all three responses correct) |
| Communicating with number symbols Q.4 | No numbers are recognisable. | Reversals and/or inversions inhibit recognition of numbers. | Issues of shape and/or proportion compromise recognition of numbers. | All numbers are clearly formed and easily recognisable. |

Figure 27: LGP Numeracy Skills Scoring Rubric for Grade R

GRADE 1 – Numeracy Skills Test

| | | |
|---|--|--|
| Q.1 – How many crayons are shown? | <p>Look at these crayons.</p>  | |
| Q.2 – How many crayons will be left if I lose 3 crayons? | | |
| Q.3 – How many crayons will I have if my friend gives me 5 more crayons after I lost my 3 crayons? | | |
| <p>Q.4 – What is the answer?</p> $4 + 5 =$ | <p>Q.5 – What is the answer?</p> $10 - 3 =$ | |


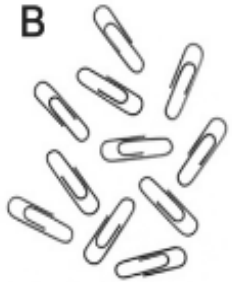


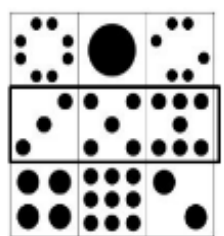
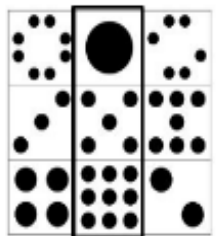
| | |
|---|--|
| <p>Q.6 – Look at these two sets of paperclips. Which set of paper clips is SMALLER? Draw a circle around the letter showing LESS paper clips.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>A</p>  </div> <div style="text-align: center;"> <p>B</p>  </div> </div> | <p>Q.7 – Look at these two rows of apples. Which row has MORE apples? Draw a circle around the letter showing MORE apples.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>A</p>  </div> <div style="text-align: center;"> <p>B</p>  </div> </div> |
| <p>Q.8 – Look at the boxes of dots. How many dots are shown in the middle row of boxes? Write the number.</p> <div style="text-align: center;">  </div> | <p>Q.9 – Look at the boxes of dots. How many dots are shown in the middle column of boxes? Write the number.</p> <div style="text-align: center;">  </div> |
| <p>Q.10 – What is the answer?</p> <p style="text-align: center; font-size: 1.2em;">$18 + 3 =$</p> | <p>Q.11 – What is the answer?</p> <p style="text-align: center; font-size: 1.2em;">$14 - 6 =$</p> |

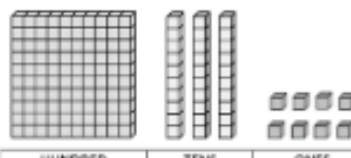
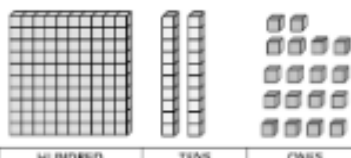
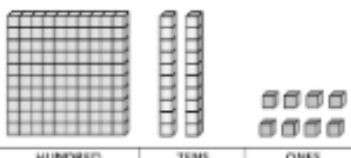
Figure 28: LGP Numeracy Skills Assessment Tool for Grade 1

GRADE 1 – Numeracy Skills Assessment Rubric

| Assessment Criteria | Performance Level 0 | Performance Level 1 | Performance Level 2 | Performance Level 3 |
|---|---|---|---|--|
| Using visual representations to count and identify numbers Q.1; Q.8; Q.9 | No recognisable response. (no correct responses) | Can count but unable to work further with number (one response correct) | Can count and manipulate total once. (two responses correct) | Correctly counts, subtracts and adds sequentially (all three responses correct) |
| Using visual representations to compare sets of numbers Q.6; Q.7 | No recognisable response. (neither responses are correct) | Can simply compare with size distractor. (only second response is correct) | Can compare with volume distractor. (only first response is correct) | Correctly compares sets. (both responses are correct) |
| Using visual and symbolic representations to add numbers Q.3; Q.4; Q.10 | No recognisably correct attempts are evident. (no correct responses) | Attempts to add are evident but incorrect. (one response correct) | Can add single-digit sums only. (two responses correct) | Correctly adds multi-digit numbers. (all three responses correct) |
| Using visual and symbolic representations to subtract numbers Q.2; Q.5; Q.11 | No recognisably correct attempts are evident. (no correct responses) | Attempts to subtract are evident but incorrect. (one response correct) | Can find single-digit differences only. (two responses correct) | Correctly subtracts multi-digit numbers. (all three responses correct) |
| Communicating with number symbols all Q. | No numbers are recognisable. | Reversals and/or inversions inhibit recognition of numbers. | Issues of shape and/or proportion compromise recognition of numbers. | All numbers are clearly formed and easily recognisable. |

Figure 29: LGP Numeracy Skills Scoring Rubric for Grade 1

GRADE 2 – Numeracy Skills Test

| | | |
|--|---|--|
| <p>Q.1 – How many small blocks are shown in total in the picture below?</p>  <p>HUNDRED TENS ONES</p> <p>Write the number.</p> | <p>Q.2 – How many small blocks will remain in total if I remove 1 column of TENS as shown below?</p>  <p>HUNDRED TENS ONES</p> <p>Write the number.</p> | <p>Q.3 – How many small blocks will there be in total if, when I return the 1 column of TENS, I break it up into separate small blocks and put these with the ONES as shown below?</p>  <p>HUNDRED TENS ONES</p> <p>Write the number.</p> |
| <p>Q.4 – What is the answer?</p> <p style="font-size: 1.5em;">$34 + 12 =$</p> | | <p>Q.5 – What is the answer?</p> <p style="font-size: 1.5em;">$34 - 12 =$</p> |




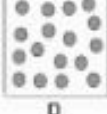



| | | | |
|--|---|--|--|
| <p>Q.6 – Which set of dots is the LARGEST? Draw a circle around the letter of the set showing MOST dots.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>A</p>  </div> <div style="text-align: center;"> <p>B</p>  </div> <div style="text-align: center;"> <p>C</p>  </div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> <div style="text-align: center;"> <p>D</p>  </div> <div style="text-align: center;"> <p>E</p>  </div> <div style="text-align: center;"> <p>F</p>  </div> </div> | | <p>Q.7 – Write down any number BETWEEN 60 and 70 in the space below. (BETWEEN means bigger than 60 and smaller than 70.)</p> | |
| <p>Q.8 – Look at the number line below. Draw a mark on the number line to show the position of the number between 60 and 70 that you wrote above.</p>  | | | |
| <p>Q.9 – What is the answer?</p> <p>$18 + 43 =$</p> | <p>Q.10 – What is the answer?</p> <p>$54 - 16 =$</p> | <p>Q.11 – What is the answer?</p> <p>$4 \times 2 =$</p> | <p>Q.12 – What is the answer?</p> <p>$9 \times 5 =$</p> |

Figure 30: LGP Numeracy Skills Assessment Tool for Grade 2

GRADE 2 – Numeracy Skills Assessment Rubric

| Assessment Criteria | Performance Level 0 | Performance Level 1 | Performance Level 2 | Performance Level 3 |
|---|---|---|---|--|
| Using visual representations to count and identify numbers Q.1; Q.2; Q.3 | No recognisable response. (no responses correct) | Can count but unable to work further with number. (one response correct) | Can count and manipulate numbers in simple cases. (two responses correct) | Correctly counts, and manipulates numbers in all cases. (all three responses correct) |
| Using visual representations to compare sets and numbers Q.6; Q.7; Q.8 | No recognisable response. (no responses correct) | Can simply compare sets. (one response correct) | Can compare sets and numbers in simple cases. (two responses correct) | Correctly compares sets and numbers in all cases. (all three responses correct) |
| Using visual and symbolic representations to add numbers Q.4; Q.9 | No recognisably correct attempts are evident. (no responses correct) | Can add double-digit numbers not requiring regrouping. (one response correct) | Correctly adds double-digit numbers with and without regrouping. (both responses correct) | |
| Using visual and symbolic representations to subtract numbers Q.5; Q.10 | No recognisably correct attempts are evident. (no responses correct) | Can subtract double digit numbers not requiring regrouping. (one response correct) | Correctly subtracts double digit numbers with and without regrouping. (both responses correct) | |
| Using symbolic representations to multiply numbers Q.11; Q.12 | No recognisably correct attempts are evident. (no responses correct) | Can multiply by doubling only. (one response correct) | Correctly multiplies with a factor of 5 too. (both responses are correct) | |
| Communicating with number symbols All Q. | No numbers are recognisable. | Reversals and/or inversions inhibit recognition of numbers. | Issues of shape and/or proportion compromise recognition of numbers. | All numbers are clearly formed and easily recognisable. |

Figure 31: LGP Numeracy Skills Scoring Rubric for Grade 2

Analysis of Numeracy Skills Results

Rubric scores were collected in MS Excel and an average percentage (out of a total score of 12 for Grade R and 15 for Grades 1 and 2) calculated for each learner in each school, each province and an overall average for all project schools. The same treatment was applied to the control school data. Overall project school data was compared to control school data and this was shared with the project schools and used to evaluate the impact of the LGP project.

3.2.5 Learner Data Collection & Analysis: Visual Literacy Skills

Assessment tool design was based on the LGP theory of change, the assumptions about the Xbox Kinect and tablet technology's impact on visual literacy skills and the Language requirements of the CAPS curriculum for Foundation Phase. The visual literacy tests were a pencil and paper test which needed to be carefully administered with these very young children. Tests were grade-specific and focused on visual discrimination and visual interpretation skills required by the CAPS curriculum. Responses were assessed using rubrics.






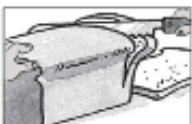
The Visual Literacy Skills Assessment Tools

The Visual Literacy Skills Test was written by each learner under test conditions. Instructions were given verbally in English and in isiXhosa and Afrikaans in Western Cape schools and in isiZulu in KZN schools.

GRADE R – Visual Literacy Skills Test

| | | |
|---|---|---|
| Q.1 – Match the pictures by drawing a line to connect the same shapes | | |
| | | |
| Q.2 – Draw a circle around each letter d written below | Q.3 – Draw a circle around each letter s written below | Q.4 – Draw a circle around the words starting with the letter n |
| a b c d n a d b p d h o | ask size dress | nose tired nickel normal two none need weed north apple roof fish nest never nine quest |

| | | | | | | | | | | | | | | | | | | | | | |
|--|--|-----|-----|-----|----|----|----|----|----|-----|----|----|---|-----|-----|-----|------|-----|-----|------|-----|
| Q.5 – Match the words by drawing circles around the same words | Q.6 – Match the words by drawing a line to the same words | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width: 100%; text-align: center;"> <tr> <td style="padding: 5px;">bun</td> <td style="padding: 5px;">cup</td> <td style="padding: 5px;">dog</td> <td style="padding: 5px;">bun</td> </tr> <tr> <td style="padding: 5px;">in</td> <td style="padding: 5px;">it</td> <td style="padding: 5px;">on</td> <td style="padding: 5px;">in</td> </tr> <tr> <td style="padding: 5px;">on</td> <td style="padding: 5px;">and</td> <td style="padding: 5px;">on</td> <td style="padding: 5px;">no</td> </tr> </table> | bun | cup | dog | bun | in | it | on | in | on | and | on | no | <table style="width: 100%;"> <tr> <td style="width: 50%; text-align: center;">big</td> <td style="width: 50%; text-align: center;">can</td> </tr> <tr> <td style="text-align: center;">can</td> <td style="text-align: center;">play</td> </tr> <tr> <td style="text-align: center;">you</td> <td style="text-align: center;">big</td> </tr> <tr> <td style="text-align: center;">play</td> <td style="text-align: center;">you</td> </tr> </table> | big | can | can | play | you | big | play | you |
| bun | cup | dog | bun | | | | | | | | | | | | | | | | | | |
| in | it | on | in | | | | | | | | | | | | | | | | | | |
| on | and | on | no | | | | | | | | | | | | | | | | | | |
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| you | big | | | | | | | | | | | | | | | | | | | | |
| play | you | | | | | | | | | | | | | | | | | | | | |

| | | |
|--|---|--|
| Q.7 – What happens first? Put these in the correct order by writing 1 in the little box next to the picture showing what happens first. Write 2 for what happens second and write 3 for what happens third. | | |
|  |  |  |
|  |  |  |







| | |
|--|--|
| Q.8 – Draw a circle around the face of the sad person | Q.9 – Draw a circle around the face of the happy person |
|    |    |

Figure 32: LGP Visual Literacy Skills Assessment Tool for Grade R

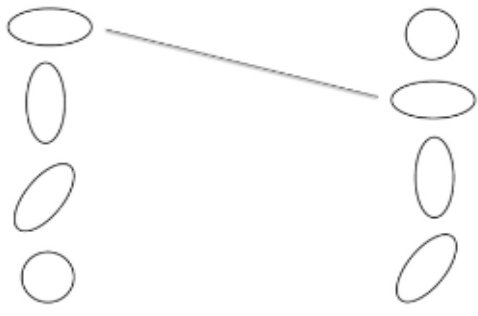
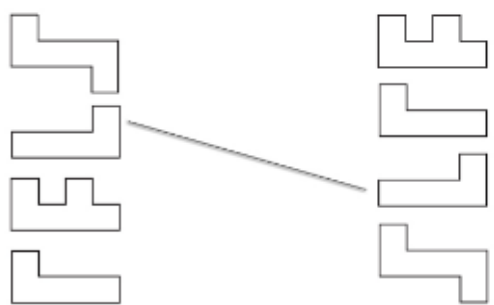
GRADE R – Visual Literacy Skills Rubric

| Assessment Criteria | Performance Level 0 | Performance Level 1 | Performance Level 2 | Performance Level 3 |
|---|---|---|--|---|
| Demonstrating visual discrimination in matching shapes Q.1 | No recognisable response. Choices appear random. | Matching some shapes but makes many errors. Less than 5 links correct. | Matches almost all shapes but makes minor error/s. 5-6 links correct. | Expertly matches all shapes without error. All 7 links correct. |
| Demonstrating visual discrimination in matching letters Q.2; Q.3; Q.4 | No recognisable response in more than half of the options. Choices appear random. | Recognition and matching of letters mostly unsuccessful. Reversals/ inversions evident. Errors of inclusion and omission. | Recognises and matches most letters but makes some minor errors. Choices correct but with some omission. | Expertly recognises and correctly matches all specified letters without error. All letters correct. |
| Demonstrating visual discrimination in matching words Q.5; Q.6 | No recognisable response. Choices appear random. | Recognition of words mostly unsuccessful. Reversals evident. Makes errors of inclusion and omission. Less than 5 links correct. | Recognises most words but makes minor errors of omission. 5-6 links correct. | Expertly matches all words without error. All 7 links correct. |
| Demonstrating visual interpretation in sequencing pictures Q.7 | No recognisably correct response. | Can identify sequence in one story with incorrect start in other or can identify first steps only in each story. | Attempts to put pictures in correct sequence but makes minor errors towards the end in one story. | Expertly puts all pictures in correct sequence for both visual stories. |
| Demonstrating visual interpretation in identifying human emotions Q.8; Q.9 | No correct response or inclusions create conflict or inhibit recognition. | Identifies only one emotion clearly and correctly. | | Expertly identifies emotions – two distinct, correct choices made with no inclusions. |

Figure 33: LGP Visual Literacy Skills Scoring Rubric for Grade R

GRADE 1 – Visual Literacy Skills Test

Q.1 – Match the pictures by **drawing a line** to connect the **same shapes**

| | |
|---|--|
|  |  |
|---|--|

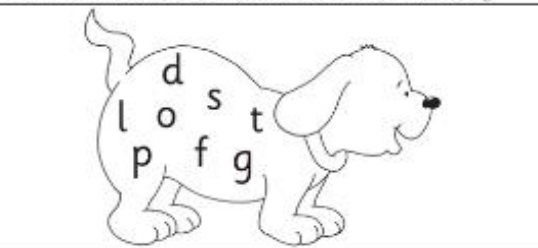
Q.2 – Match the words by **drawing a line** to connect the **same words**

| | |
|--|--|
| <div style="display: flex; justify-content: space-around;"> <div>big can you play</div> <div>can play big you</div> </div> | <div style="display: flex; justify-content: space-around;"> <div>moon dog cow hat</div> <div>dog cow hat moon</div> </div> |
|--|--|

Q.3 Draw circles around the letters in the word **hat**



Q.4 Draw circles around the letters in the word **dog**



Q.5 – What happens first? Put these in the correct order by **writing 1** in the little box next to the picture showing what happens first. **Write 2** for what happens second and **write 3** for what happens third.







| | | |
|---|---|--|
|  <div style="display: inline-block; width: 40px; height: 40px; border: 1px solid black; margin-left: 10px;"></div> |  <div style="display: inline-block; width: 40px; height: 40px; border: 1px solid black; margin-left: 10px;"></div> |  <div style="display: inline-block; width: 40px; height: 40px; border: 1px solid black; margin-left: 10px;"></div> |
|  <div style="display: inline-block; width: 60px; height: 30px; border: 1px solid black; margin-left: 10px;"></div> |  <div style="display: inline-block; width: 60px; height: 30px; border: 1px solid black; margin-left: 10px;"></div> |  <div style="display: inline-block; width: 60px; height: 30px; border: 1px solid black; margin-left: 10px;"></div> |

Figure 34: LGP Visual Literacy Skills Scoring Rubric for Grade 2

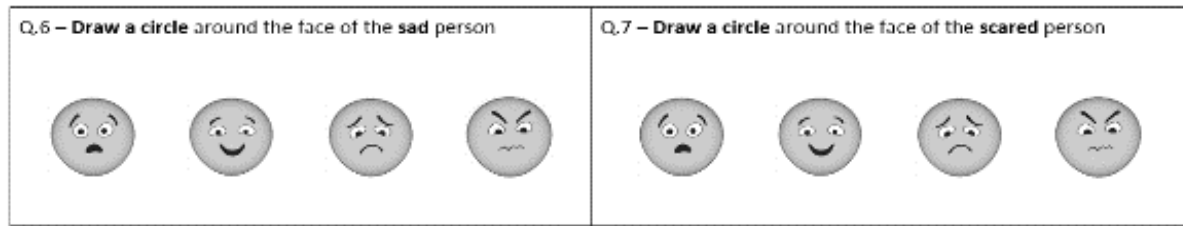


Figure 35: LGP Visual Literacy Skills Assessment Tool for Grade 1

GRADE 1 – Visual Literacy Skills Assessment Rubric

| Assessment Criteria | Performance Level 0 | Performance Level 1 | Performance Level 2 | Performance Level 3 |
|---|---|---|--|---|
| Demonstrating visual discrimination in matching shapes Q.1 | No recognisable response. | Matching some shapes but makes many errors. Less than 5 links correct. | Matches almost all shapes but makes minor error/s. 5 links correct. | Expertly matches all shapes without error. All 8 links correct. |
| Demonstrating visual discrimination in matching words Q.2 | No recognisable response or no more than one correct link in each activity. | Matching some words but makes many errors. Less than 8 links correct. | Matches almost all words but makes minor error/s. 6-7 links correct. | Expertly matches all words without error. All 9 links correct. |
| Demonstrating visual discrimination in identifying letters Q.3, Q.4 | No recognisable response. Choices appear random. More than 3 letters are chosen per word. | Recognition of letters mostly unsuccessful. Errors of reversal/ inversion/ substitution. 1-3 letters are chosen per word. | Recognises and chooses correct letters but makes omissions/ errors with the g/g and a/a. | Expertly recognises all specified letters without error. All letters correct. |
| Demonstrating visual interpretation in sequencing pictures Q.5 | No recognisably correct response. | Can identify sequence in one story with incorrect start in other or can identify first steps only in each story. | Puts pictures in roughly correct sequence but makes minor errors towards the end in one story. | Expertly puts all pictures in correct sequence for both visual stories. |
| Demonstrating visual interpretation in identifying human emotions Q.6, Q.7 | No correct response or inclusions create conflict or inhibit recognition. | Identifies only one emotion clearly and correctly. | | Expertly identifies emotions – two distinct, correct choices made with no inclusions. |

Figure 36: LGP Visual Literacy Skills Scoring Rubric for Grade 1

GRADE 2 – Visual Literacy Skills Test

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|----------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|----------|----------|---|---|---|---|
| <p>Q.1 – Match the words by drawing a circle around the word on the right which is the same as the first word in each row.</p> <div style="display: flex; justify-content: space-around; margin-bottom: 10px;"> <div style="border: 1px solid black; padding: 2px 10px;">in</div> <div style="border: 1px solid black; padding: 2px 10px;">it</div> <div style="border: 1px solid black; padding: 2px 10px;">on</div> <div style="border: 1px solid black; padding: 2px 10px;">in</div> </div> <div style="display: flex; justify-content: space-around; margin-bottom: 10px;"> <div style="border: 1px solid black; padding: 2px 10px;">on</div> <div style="border: 1px solid black; padding: 2px 10px;">no</div> <div style="border: 1px solid black; padding: 2px 10px;">one</div> <div style="border: 1px solid black; padding: 2px 10px;">on</div> </div> <div style="display: flex; justify-content: space-around; margin-bottom: 10px;"> <div style="border: 1px solid black; padding: 2px 10px;">big</div> <div style="border: 1px solid black; padding: 2px 10px;">dig</div> <div style="border: 1px solid black; padding: 2px 10px;">big</div> <div style="border: 1px solid black; padding: 2px 10px;">pig</div> </div> <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 2px 10px;">pin</div> <div style="border: 1px solid black; padding: 2px 10px;">bin</div> <div style="border: 1px solid black; padding: 2px 10px;">nip</div> <div style="border: 1px solid black; padding: 2px 10px;">pin</div> </div> | <p>Q.2 – Find and circle these words in the puzzle below.</p> <p style="text-align: center; font-family: cursive;">fan bell well see</p> <table border="1" style="margin: 10px auto; text-align: center;"> <tr><td>x</td><td>b</td><td>s</td><td>w</td><td>e</td><td>l</td><td>l</td></tr> <tr><td>y</td><td>i</td><td>l</td><td>o</td><td>g</td><td>r</td><td>e</td></tr> <tr><td>s</td><td>e</td><td>e</td><td>u</td><td>n</td><td>y</td><td>l</td></tr> <tr><td>j</td><td>d</td><td>u</td><td>b</td><td>e</td><td>l</td><td>l</td></tr> <tr><td>f</td><td>a</td><td>n</td><td>y</td><td>l</td><td>a</td><td>x</td></tr> </table> | x | b | s | w | e | l | l | y | i | l | o | g | r | e | s | e | e | u | n | y | l | j | d | u | b | e | l | l | f | a | n | y | l | a | x |
| x | b | s | w | e | l | l | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| y | i | l | o | g | r | e | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| s | e | e | u | n | y | l | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| j | d | u | b | e | l | l | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| f | a | n | y | l | a | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Q.3 – What happens first? Put these in the correct order by **writing 1** in the little box next to the picture showing what happens first. **Write 2** for what happens second and **write 3** for what happens third.

What happens first? Put these in the correct order by **writing 1** in the little box next to the picture showing what happens first. **Write 2** for what happens second, **write 3** for what happens third and **write 4** for what happens fourth.

Q.4 – **Draw a circle** around the face of the **angry** person.

Q.5 – **Draw a circle** around the face of the **scared** person.

Figure 37: LGP Visual Literacy Skills Assessment Tool for Grade 2

GRADE 2 – Visual Literacy Skills Assessment Rubric

| Assessment Criteria | Performance Level 0 | Performance Level 1 | Performance Level 2 | Performance Level 3 |
|---|---|--|--|---|
| Demonstrating visual discrimination in matching words Q.1 | No recognisable or correct responses. | Matching some words but makes errors. 1-2 matches correct. | Matches almost all words but makes minor error. 3 matches correct. | Expertly matches all words without error. All 4 matches correct. |
| Demonstrating visual discrimination in finding words in a word search puzzle Q.2 | No recognisable or correct responses. | Finds one word but makes errors with the rest. 1 correct. | Finds almost all words but makes minor error. 2 correct. | Expertly finds all words without error. All 3 correct. |
| Demonstrating visual interpretation in sequencing pictures Q.3 | No recognisably correct response. | Can identify sequence in one story with incorrect start in other or can identify first steps only in each story. | Puts pictures in roughly correct sequence but makes minor errors towards the end in one story. | Expertly puts all pictures in correct sequence for both visual stories. |
| Demonstrating visual interpretation in identifying human emotions Q.4, Q.5 | No correct response or inclusions create conflict or inhibit recognition. | Identifies only one emotion clearly and correctly. | | Expertly identifies emotions – two distinct, correct choices made with no inclusions. |

Figure 38: LGP Visual Literacy Skills Scoring Rubric for Grade 2

Analysis of Visual Literacy Skills Results

Rubric scores were collected in MS Excel and an average percentage (out of a total score of 15 for Grades R and 1 and 12 for Grade 2) calculated for each learner in each school, each province and an overall average for all project schools. The same treatment was applied to the control school data. Overall project school data was compared to control school data and this was used to evaluate the impact of the LGP project. The learner performance data was shared with the project schools at a workshop devoted to this purpose.

3.2.6 Learner Data Collection & Analysis: Oral English Skills

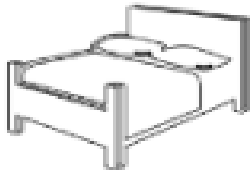

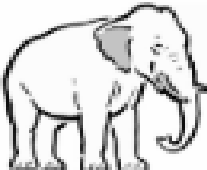
Assessment tool design was based on the LGP theory of change, the assumptions about the Xbox Kinect and tablet technology's impact on the acquisition of oral English skills and the Language policy and requirements of the CAPS curriculum for Foundation Phase. An oral English scripted interview test was designed specifically for South African Foundation Phase children for whom English was not the Home Language. The same assessment was conducted with all Foundation Phase learners no matter which Grade they were in as language acquisition rather than language learning is independent of grade level learning.

The Acquisition of Oral English Skills Assessment Tool

The Acquisition of Oral English Skills Test was conducted as a scripted interview, one-on-one with each learner outside of their classroom. All verbal responses and non-verbal actions are recorded on task scripts and scored according to rubrics.

Acquisition of Oral English Skills – Facilitated Task Script and Rubric Score-card

Name: _____ School: _____ GRADE _____

| | | |
|--|--|--|
| 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 0 = no engagement 1 = sporadic engagement 2 = simple engagement 3 = full engagement (eye-contact, focus, connected) | SPEAKING Skills – Vocabulary & Language Use 0 = no verbal response or single name only 1 = monosyllabic/simple verbal responses to more 2 = simple phrase responses (e.g. I'm...; x years old) 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) |
| <i>Expected Response Guide:</i> No verbal response = (0) Non-English verbal response = (1) English - single noun base = hands (2) English - single simple verb base = clap (2) English - single present participle = clapping (2) English multiple correct words = clap hands (3) | <i>Expected Response Guide:</i> No verbal response = (0) Non-English verbal response = (1) English - verb only = touch (var. hit?) (2) English - noun only = head (var. hand?) (2) English - multiple correct words = touch head (var.) (3) English - multiple correct words = you touch your head (var.) (3) English - present participle + noun = you're touching your head (var.) (3) | <i>Expected Response Guide:</i> No verbal response = (0) Non-English verbal response = (1) English - noun only = eye/s (2) English - verb only = wink (var. blink) (2) English - multiple correct words = close eye (var.) (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. |
| <i>Expected Response Guide:</i> Listen for instruction – eye-contact and concentration Follow instruction – enaction and precision | <i>Expected Response Guide:</i> Listen for instruction – eye-contact and concentration Follow instruction – enaction and precision | <i>Expected Response Guide:</i> Listen for instruction – eye-contact and concentration Follow instruction – enaction and precision |
| LISTENING Skills – Focus & Enaction 0 = no correct physical responses 1 = poor enaction - e.g. claps once/ touches face/ stands/ OR only 1 fully correct 2 = basic enaction - e.g. claps more than twice/ touches tongue /half turns/ OR 2 fully correct 3 = exact enaction/ ALL 3 fully correct | | |
| 5. Conclusion | | |
| Thank you _____. (Shake hands) Goodbye. Enjoy the rest of your day. | | |

Figure 39: LGP Oral English Skills Assessment Tool for Foundation Phase

Analysis of Acquisition of Oral English Skills Results

Rubric scores were collected in MS Excel and an average percentage (out of a total score of 16) calculated for each learner in each school, each province and an overall average for all project schools. An average percentage for each of Listening Skills (out of a total score of 6)

and Speaking Skills (out of a total score of 10) were also recorded. The same treatment was made to the control school data. It was decided that, as acquisition of oral English skills was not grade-dependent, for this data set we would extract and use only the data for the learners that we could track and report on individually over the study period. We discarded data where a learner due to absenteeism was not tested each year.

Table 3. Oral English Skills Learner Data Sample

| 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 | The same 82 learners tracked over two years. |
| Control | | Grade R | Grade 1 | The same 31 learners tracked over two years. |

The Acquisition of Oral English Skills test and rubric also enabled the LGP team to identify which of Krashen's Second Language Acquisition Stages each learner was at when testing was conducted each year.

These SLA stages are:

Stage 1 – The Silent Period

Learners express no verbal expression except their name and may respond by nodding, pointing, gesturing or performing an act.

Stage 2 – The Early Production Stage

Learners can speak in one- or two-word phrases. Can demonstrate comprehension by short answers to simple yes/no, either/or, or who/what/where questions. They nod and shake heads and may say "I don't know".

Stage 3 – The Speech Emergence Stage

Learners begin to use dialogue and can ask and answer simple questions. Learners use basic and repetitive patterns of speech. They may produce longer sentences but often with grammatical errors that interfere with communication.

Stage 4 – The Intermediate Language Proficiency Stage

Learners start to make complex statements, state opinions, ask for clarification, share thoughts and voluntarily speak at greater length.

Stage 5 – The Advanced Language Proficiency Stage – Advanced Language Fluency

Learners are now equipped to participate fully in grade-level classroom activities. They may need occasional support but they use grammar and vocabulary comparable to a native speaker.

Learners were recorded on each stage according to their scores on the speaking skills i.e. speaking engagement in the introduction of the scripted interview test and speaking comprehension in the action identification questions of the scripted interview test. The first measure was made in the action identification questions part of the interview half way through the test to accommodate learners who may be shy to introduce themselves at the start of the interview. The introduction was used as a second measure of SLA stage as shown below.

Table 4. Oral English Acquisition Test Score Conversion to Krashen's SLA Stages

| 1st Step Check 3. Action Identification Questions Score | 2nd Step Check 1. Introduction Speaking Skills Score | Score Options | SLA Stage |
|---|--|----------------------|------------------|
| If score = 0 then | - | (0,0)(0,1)(0,2)(0,3) | SLA stage = 1 |
| If score = 1 and | If score = 0 then | (1,0) | SLA stage = 1 |
| | If score = 1 or 2 or 3 then | (1,1)(1,2)(1,3) | SLA stage = 2 |
| If score = 2 and | If score = 0 or 1 then | (2,0)(2,1) | SLA stage = 2 |
| | If score = 2 or 3 then | (2,2)(2,3) | SLA stage = 2 |
| If score = 3 and | If score = 0 | (3,0) | SLA stage = 2 |
| | If score = 1 or 2 or 3 then | (3,1)(3,2)(3,3) | SLA stage = 3 |
| If score = 4 and | If score = 0 or 1 or 2 then | (4,0)(4,1)(4,2) | SLA stage = 3 |
| | If score = 3 then | (4,3) | SLA stage = 4 |

The test was not designed to distinguish between SLA stage 4 and SLA stage 5 performance.

3.3 Teacher Evaluation

Baseline testing of teachers at the start of the project was by means of self-assessment. Teachers completed questionnaires individually answering questions on their classroom practice. They were required:

- to draw a sketch of their classroom environment and identify the location of different learning activities;
- to indicate the percentage of working day time spent interacting with the whole class, small groups, individual learners and teaching colleagues;
- to identify teaching methods employed and the frequency of these in whole-class activities, small-group activities and individual activities; and
- to identify learner actions and the frequency of these over the course of the grade year.

While aspects of the information shared around classroom practice were interesting, the data appeared unreliable, because in most cases, all options were selected as occurring with a daily frequency, which would be practically impossible. It was therefore decided to adopt a retrospective self-assessment approach to be conducted at the end of the project period. We found that teachers were more confident after improvement to discuss the weaknesses in their teaching skills at the start of the project.

A baseline survey of teachers' technology access, experience and self-rated skill level was also conducted at the start of the project. The retrospective survey included self-assessment of technology skills and the ratings allocated at the start of the project (retrospectively) were compared with the actual ratings collected at the start of the project to inform on validity. Teacher attitudes of motivation, self-confidence and perceived confidence of work colleagues were also self-assessed in the retrospective teacher survey. This survey is included in the Appendix.

3.3.1 Data Collection & Analysis: Change in Classroom Practice

Quantitative data was gathered through the analysis of self-assessments on a retrospective teacher survey. The retrospective teacher survey focused on three aspects of teaching practice: classroom management skills, curriculum and content knowledge, and pedagogical skills. For each of these aspects, the teachers were provided with a rating scale from 0 to 10 (where 10 is a perfect score). There was one rating scale for the start of the LGP and another for the end of the LGP project. Each teacher was asked to circle the number on each scale that best reflected their level of particular skill or knowledge at that point in the LGP project (i.e. at the start and at the end). Teachers completed the survey anonymously.

All scores were collected and an average score for each of the three criteria: classroom management skills, curriculum and content knowledge and pedagogical skills was calculated for the start and the end of the LGP for comparison in order to inform on teachers' perceived progress.

Qualitative data was gathered through case-studies conducted with eight teachers who represented the diversity of participants in the project. One-on-one interviews were conducted with each teacher.

The format of each interview was as follows:

Table 5. Teacher Case-Study Questions

| | |
|-----------------|---|
| LOOKING BACK | <ul style="list-style-type: none"> • Why did you become a teacher? • How did you become a teacher? • What kind of a teacher were you at the start of the LGP project (2014)? |
| LOOKING IN | <ul style="list-style-type: none"> • What personal strengths do you bring to your teaching work? • What personal weaknesses do you manage in your teaching work? • How did the LGP project affect you personally? |
| LOOKING OUT | <ul style="list-style-type: none"> • What is your school community like: colleagues, management, learners, parents? • What opinions and feedback did you receive about the LGP project from your school community? • How did the LGP project affect you professionally? |
| LOOKING FORWARD | <ul style="list-style-type: none"> • What are your views (or plans) around integrating technology in the classroom going forward? • What are your views (or plans) around learning through play going forward? • What kind of a teacher will you be after the LGP project ends (2017)? |

Case-studies provided deeper insight for understanding the analysis of the quantitative data. These also highlighted issues of relationships within the project schools, both personal and professional that had an impact on particular teachers and within particular schools.

3.3.2 Data Collection & Analysis: Change in Technology Skills

The retrospective teacher survey focused on the technology skills of using a tablet and an Xbox Kinect. For each of these skills, the teachers were provided with a rating scale from 0 to 10 (where 10 is a perfect score). There was one rating scale for the start of the LGP and another for the end of the LGP project. Each teacher was asked to circle the number on each scale that best reflected their level of particular skill at that point in the LGP project (i.e. at the start and at the end). Teachers completed the survey anonymously.

All scores were collected and an average score for each of the two criteria: tablet technology skills and Xbox Kinect technology skills was calculated for the start and the end of the LGP for comparison in order to inform on teachers' perceived progress.

3.3.3 Data Collection & Analysis: Change in Attitudes

The retrospective teacher survey focused on three aspects: the teacher's level of motivation for her work, the teacher's level of confidence in her work, the teacher's perception of her colleagues' and SMT members' confidence in her work. For each of these aspects, the teachers were provided with a rating scale from 0 to 10 (where 10 is a perfect score). There was one rating scale for the start of the LGP and another for the end of the LGP project. Each teacher was asked to circle the number on each scale that best reflected their level of particular skill at that point in the LGP project (i.e. at the start and at the end). Teachers completed the survey anonymously.

All scores were collected and an average score for each of the three criteria: self-motivation, self-confidence and perception of colleagues' confidence, was calculated for the start and the end of the LGP for comparison in order to inform on teachers' perceived progress.

3.3.4 Data Collection & Analysis: LGP Project Support

Although not part of the retrospective teacher survey, at the end of the project all teachers completed a survey to establish the levels of support they experienced over the course of the LGP project. Again, the teachers were provided with a rating scale from 0 to 10 (where 10 is a perfect score) to rate the level of support that they experienced from the education department officials, their principal/ deputy principal, their head of departments, their teaching colleagues and the LGP staff. Teachers completed the survey anonymously.

Change Management training for SMTs at each project school was an active input in the LGP project design. In the Western Cape, e-Learning officials from the district office were very involved in the LGP project, organizing logistics, attending workshops and following up at schools with technical support and educational input. This was not the case in KZN where district officials were not involved despite the opportunity for this that LGP provided.

All rating scale scores were collected and an average score for each of the areas of support was calculated for comparison between schools and provinces to establish whether support needs had been met and if so, by whom.

3.4 Ethical Issues

The developmental approach of the evaluation of the LGP made data and reflections available at regular intervals for review and these were fed directly into the project as per the LGP theory of change's input. This meant that the evaluation results were able to be immediately incorporated into the programme design and implementation as the project unfolded. This

was advantageous to the project and promoted reliability, validity and effectiveness of the evaluative data. Care has been taken to maintain anonymity when referring to schools, teacher and learners and if any identities have been disclosed, it has only been through their success stories.

4. CHAPTER FOUR – Results & Discussion: Learners' Numeracy Skills

4.1 Rationale

While numeracy was not originally included in the LGP project design, the assessment of numeracy skills was added to the project evaluation in 2015 because the wealth of learning opportunities afforded by the technology had become apparent.

The LGP team sourced recommended apps to integrate in learning activities to stimulate and enhance numeracy skills such as: counting, skip counting and subitising; representing, identifying, describing and comparing numbers; number bonds and operations; and interpreting and using number symbols. The Xbox Kinect also provided learning opportunities for the development of number sense and numerical skills by means of the different games and sports scoring protocols, e.g. counting in chunks in tennis, comparing distances in javelin, subtracting in darts, etc.

As discussed in Chapter Three, the evaluation methodology for numeracy were pencil and paper tests. Tests are grade-specific and focused on number concept, number operations (of addition and subtraction) and communicating with number symbols. Responses were assessed using rubrics.

Grade R and Grade 1 learners in the ten project schools and two control schools in the Western Cape and KwaZulu-Natal provinces wrote their first numeracy tests in June to September 2015 so this baseline reflected some progress already achieved. Results were collected, processed and analysed.

4.2 Results

Final assessment of the learners was conducted in July to September 2016. Two cohorts of learners were assessed: the 2015 Grade R learners were tested in Grade 1 in 2016 (referred to as Cohort 1); and the 2015 Grade 1 learners who were tested in Grade 2 in 2016 (referred

to as Cohort 2). Results were collected, processed, analysed and compared to the previous year. Results were as follows.

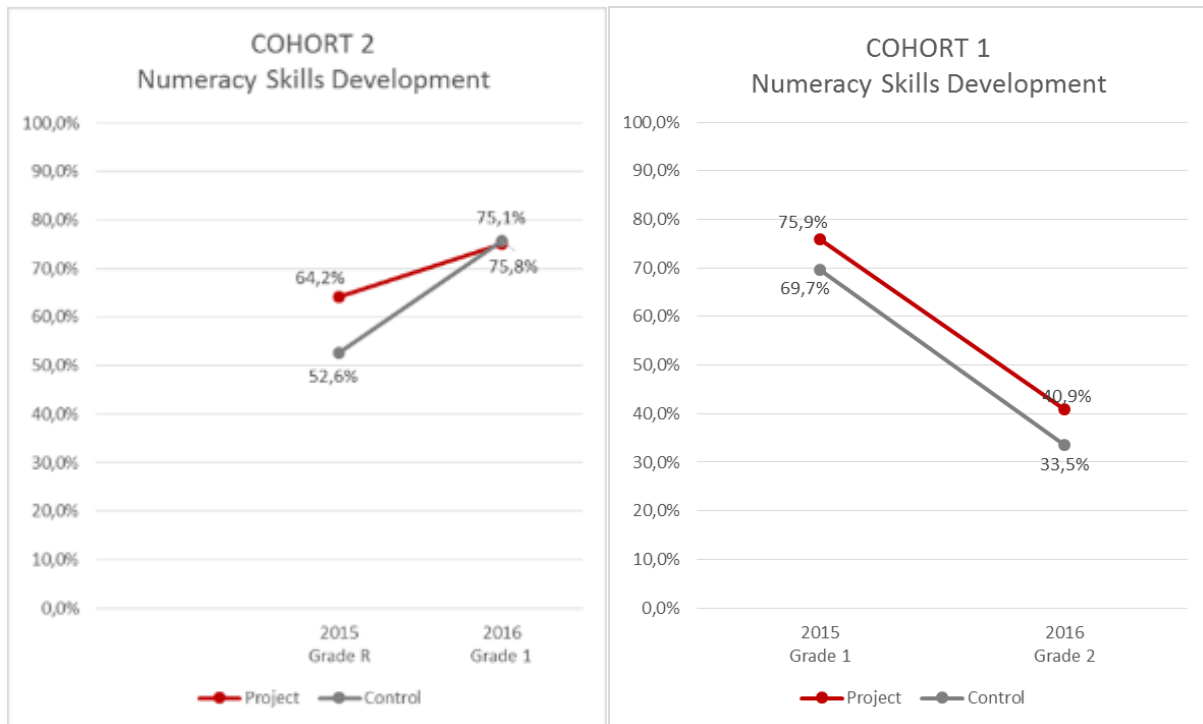


Figure 40: Numeracy Skills Development for LGP Cohorts 1 and 2

These graphs have been presented in grade order rather than cohort order to highlight the trend recorded among learners at all schools that were assessed. While there was an improvement in numeracy skills from Grade R to Grade 1 in all project and control schools, there was a crash in numeracy skills from Grade 1 to Grade 2. The assessments were designed to test CAPS requirements up to Term 2 of the grade year. The LGP assessments were conducted in Term 3 and these poor results were an indication of learners having fallen behind. While this is a widely recognized national problem with the majority of learners leaving Foundation Phase already three years behind in Maths (Spaull & Kotze, 2015), it was sobering to see the extent and consistency of the problem in all of the schools. There was no significant difference between LGP project learners and control learners although it was interesting to see that the project learners had higher baseline scores than the control learners (which had not been the case with any of the other literacies tested). As the learners had been using the numeracy tablet apps for six months before testing in the case of the Grade R learners and a year and a half before testing in the case of the Grade 1 learners, their teachers believed that the numeracy apps had improved their learners numeracy skills. Among Cohort 2 learners, the control learners caught up to the project learners by their Grade 1 mid-year.

When considering the specific numeracy skills, these were divided into number concept skills and number operations as shown in the table which follows.

Table 6. Specific Numeracy Skills Assessed

| | Grade R learners | Grade 1 learners | Grade 2 learners |
|-------------------|---|--|---|
| Number Concept | <ul style="list-style-type: none"> Using visual representations to count, identify and represent numbers Using visual representations to compare sets of numbers Communicating with number symbols | <ul style="list-style-type: none"> Using visual representations to count and identify numbers Using visual representations to compare sets of numbers Communicating with number symbols | <ul style="list-style-type: none"> Using visual representations to count and identify numbers Using visual representations to compare sets of numbers Communicating with number symbols |
| Number Operations | <ul style="list-style-type: none"> Using visual representations to interpret and work with numbers less than 10 | <ul style="list-style-type: none"> Using visual and symbolic representation to add numbers less than 20 Using visual and symbolic representation to subtract numbers less than 20 | <ul style="list-style-type: none"> Using visual and symbolic representation to add numbers less than 50 Using visual and symbolic representation to subtract numbers less than 50 Using visual and symbolic representation to multiply single digit numbers by 2 and 5 |

COHORT 2
Specific Numeracy Skills Development

| Skill | 2015 Grade R | 2016 Grade 1 |
|-------------------|--------------|--------------|
| Number Concept | 65% | 82% |
| Number Operations | 61% | 65% |

COHORT 1
Specific Numeracy Skills Development

| Skill | 2015 Grade 1 | 2016 Grade 2 |
|-------------------|--------------|--------------|
| Number Concept | 85% | 60% |
| Number Operations | 62% | 32% |

Figure 41: Specific Numeracy Skills Development for LGP Cohorts 1 and 2

Again the graphs are presented in grade order rather than cohort data to emphasise the grade progression pattern observed among all learners (at both LGP project and control schools). The pattern shows progress from Grade R to Grade 1 but a significant drop from Grade 1 to Grade 2. Although the two graphs above are for different cohorts of learners, the pattern is

clearly visible. The progress from Grade R to Grade 1 for Cohort 2 is minimal among KZN learners with the project progress determined by the learners in the Western Cape schools.

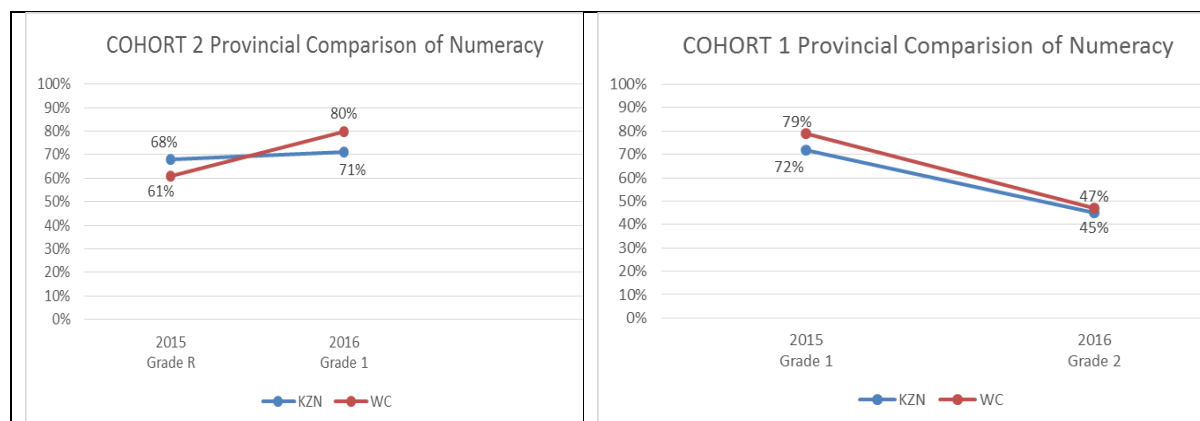


Figure 42: Provincial Comparison of Numeracy Skills Development for LGP Cohorts 1 and 2

We analysed the teachers' favourite apps to use in the classroom by calculating the percentage of Maths apps among their identified choices. There was little difference between the provinces with Maths apps making up 14% of the choices among KZN teachers compared to 16% of the choices among Western Cape teachers. For cohort 1, the same pattern of poorer performance was seen when comparing Grade 1 and Grade 2. The drop was a bit steeper for the Western Cape learners but the difference is not large enough to be significant.

4.3 Discussion

There was no measurably significant difference between project learners and control learners that would enable one to conclude that the LGP project had improved numeracy skills in Foundation Phase. The data collected reinforced the national problem of the difficulties of learning Maths in South African classrooms and highlighted the early origins of this problem – that is between mid-year Grade 1 and mid-year Grade 2.

5. CHAPTER FIVE – Results & Discussion: Learners' Gross-Motor Skills

5.1 Rationale

The Learning Gains through Play (LGP) project focused 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. Xbox Kinect consoles with data-projectors engaged learning through play and the development and practice of important gross-motor skills.

Each school received one Xbox unit which included the games console, Kinect sensor and data projector. Initially projections were made onto a screen, a white sheet or bare wall but later in the project eight schools received an additional Xbox and every school received a large television screen, ranging from 50" to 70" donated by Samsung. A variety of sports, dances and games were provided initially and further discs were added over the course of the project.

At the start of the project, the researcher identified forty four studies that explored the relationship between motor development and cognitive development. This relationship had been described as being more than merely physical activity promoting health and well-being but going beyond that to argue that motor skills impact on cognitive function (Syväoja et al, 2012). The researchers soon became aware of many more studies focusing on the same phenomenon including the notion that fine-motor skills also impacted on cognitive development (Ulreich, 2014). Project teachers studied some of this research which explored a causal link between fine and gross-motor skills and cognitive and behavioural development leading to increased academic achievement (Hanson, 2010, Singh, 2012).

As discussed in Chapter Three, the evaluation methodology for gross-motor skills was through observation of each individual learner performing the prescribed physical tasks. These tasks involved body awareness and control, spatial awareness and orientation, static and dynamic balance, laterality, coordination and rhythm. A scoring rubric was used to measure achievement of the execution of locomotor movements, the quality of locomotor movements and object-control skills of catching and throwing. Age or grade progression was established through additional repetitions and greater distances and durations.

Baseline testing was conducted with Grade R and Grade 1 learners in the ten project schools and two control schools in the Western Cape and KwaZulu-Natal provinces over the period of June to September 2014. Results were collected, processed and analysed.

5.2 Our Progress

Teachers participated in workshops focusing on game-based learning, the Xbox, and interpreting the CAPS curriculum to align classroom activities using the Xbox with curriculum requirements. Teachers' attention was drawn to the outcomes of the Life Skills CAPS document and specifically the terminology used in the Physical Education curriculum, how this translated into learning activities and the emphasis on play in Foundation Phase. In each school, teachers drew up a timetable for Xbox use so that all Grade R and Grade 1 classes would be able to make use of this technology. However due to the time and organisation

required to set the Xbox up, most schools were using the Xbox only once a week (the duration varied from 15 minutes to in excess of three hours weekly).



Figure 43: Xbox Kinect Games, Sports and Dances

Follow-up testing was conducted in the same way at the same schools in June to September 2015. Results were collected, processed, analysed and compared to the previous year. Current Grade R learners were compared with the previous year's Grade R learners. Current Grade 1 learners were compared with previous year's Grade 1 learners. This data provided limited value other than to reinforce teachers' perceptions of their cohorts. What was most valuable was to track the previous year's Grade R learners through to Grade 1 and assess the progress of that same cohort of learners.

5.3 Results

Final assessment of the learners was conducted in July to September 2016. Two cohorts of learners were assessed: the 2014 Grade R learners who had been tested in Grade 1 in 2015 and were finally tested in Grade 2 in 2016 (referred to as Cohort 1); and the 2015 Grade R learners who were finally tested in Grade 1 in 2016 (referred to as Cohort 2). Results were collected, processed, analysed and compared to the previous years. Results were as follows.

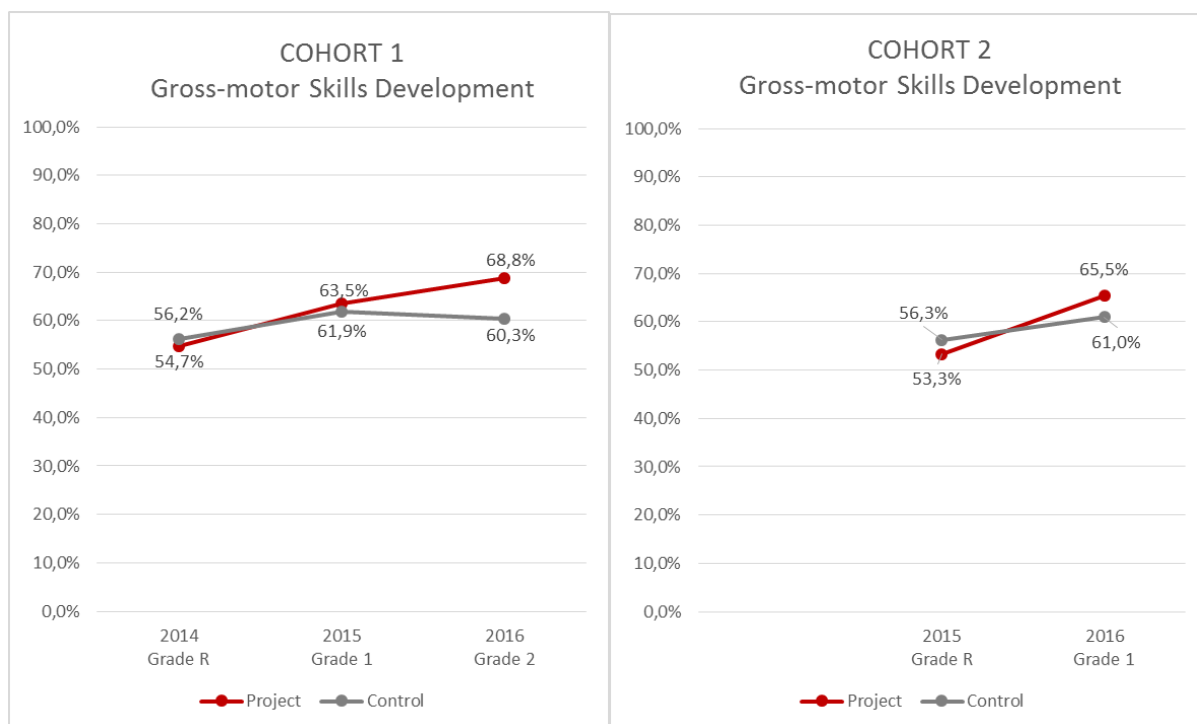


Figure 44: Gross-motor Skills Development for LGP Cohorts 1 and 2

Project school learners showed an increased development of gross-motor skills over the period (12.2 to 14.1 percentage points). This was more than three times the improvement made by the control school learners (4.1 to 4.7 percentage points). When considering the specific gross-motor skills assessed, the same pattern of improvement is evident for both LGP cohorts.

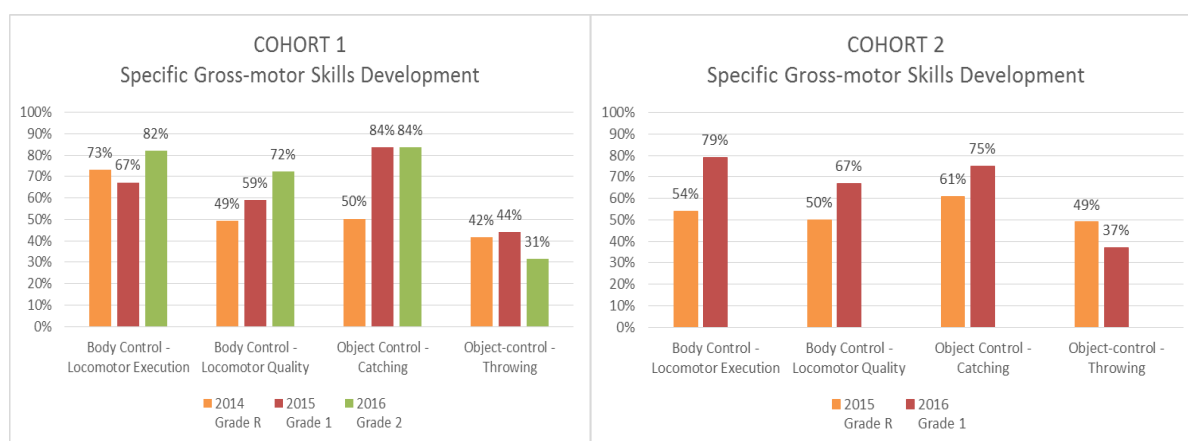


Figure 45: Specific Gross-motor Skills Development for LGP Cohorts 1 and 2

As mentioned, the method of measuring object-control skills of catching was not changed for successive grades and so improvements are not comparable to the body-control skill results.

The method of measuring object-control skills of throwing was adjusted for successive grades. Learners were required to throw bean bags into hoops at increasing distances from them. Learners struggled with the object-control throwing skills assessment and this resulted in poorer results than expected for all learners in both project cohorts and the control group. In the case of Cohort 2, object-control-throwing skills were poorer in Grade 1 than in Grade R (on a progressive test). This pattern was also the case with the control group of learners for this cohort.

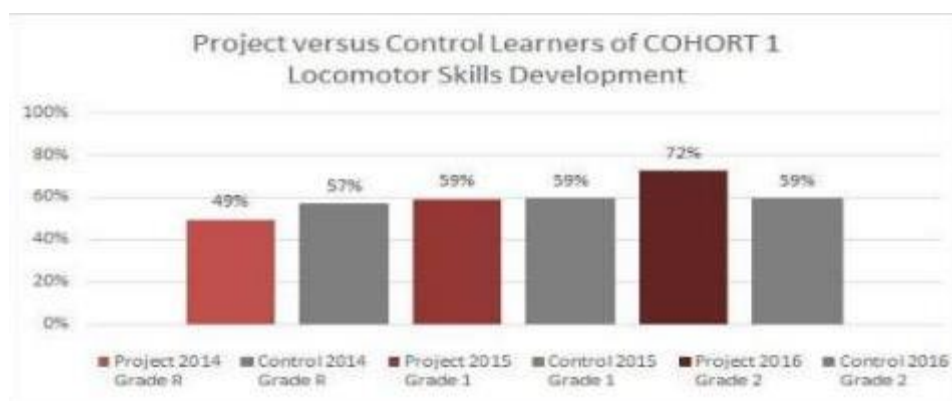


Figure 46: Locomotor Skills Development for LGP Cohort 1

As can be seen in the following example of Cohort 1 learners' locomotor skills, overall control group learners showed very little development (57% to 59% to 59%) when compared to LGP project group learners (49% to 59% to 72%).

There were little differences between provinces with KZN learners performing slightly better than Western Cape learners in gross-motor skills.

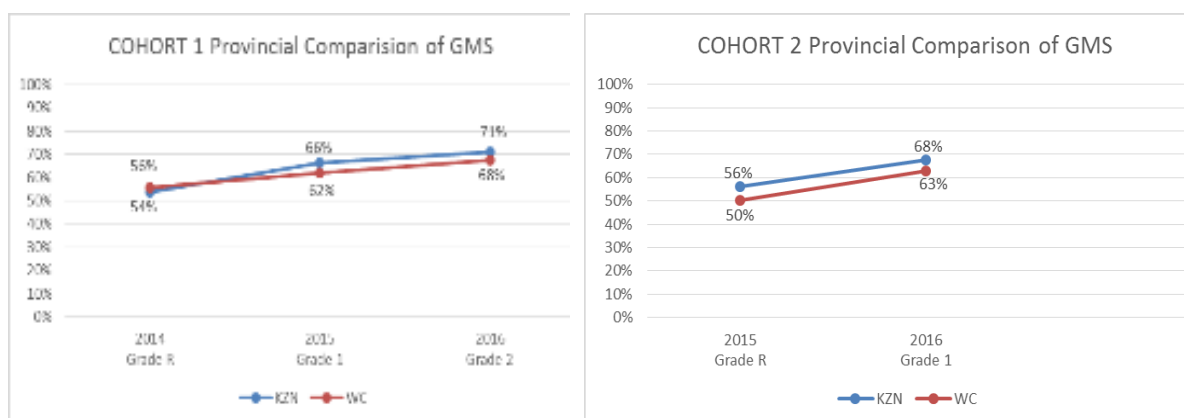


Figure 47: Provincial Comparison of Gross-motor Skills Development for LGP Cohorts 1 and 2

Teachers completed a questionnaire focusing on the usefulness of the Xbox in the classroom at the end of the project. All teachers were in agreement with the statement that "the Xbox is a valuable tool in Physical Education at school". Half of the teachers rated their agreement

as “strongly agree” versus “agree”. However due to the time and organisation required to set the Xbox up, most schools were using the Xbox only once a week (the duration varied from 15 minutes to in excess of three hours). Despite this, teachers from seven of the project schools identified the Xbox as better than traditional methods in conducting certain physical activities. All teachers commented that they would continue to integrate the Xbox in their classroom going forward after the project was complete.

5.4 Discussion

It is clear that there was a larger improvement in gross-motor skills measured in LGP project schools compared to the control schools. While this can be attributable to the intervention, it is not clear whether it is due to time using the Xbox or the teacher development workshops which supported the interpretation of curriculum outcomes using the Xbox. There was significant variation in the amount of time that learners spent using the Xbox in the different project schools (15 minute to three hours weekly) yet there were not significant differences in gross-motor skills measured in the different project schools. This suggests that it is not time on the Xbox alone that results in improved development of gross-motor skills. Teachers rated highly the workshop around analysing the Physical Education curriculum and correlating outcomes with activities using the Xbox and it seems more likely that this was an influencer on the improved gross-motor skills measured.

Another influencer may have been increased engagement of the learners in physical activities. Teachers commented on how much their learners enjoyed the Xbox games and some even mentioned that there was less absenteeism on the weekday that they used the Xbox. Teachers also mentioned that the Xbox provided opportunities to develop more than gross-motor skills – they highlighted that additional language and numeracy learning happened concurrently with the Xbox activities.

6. CHAPTER SIX – Results & Discussion: Learners’ Fine-motor Skills

6.1 Rationale

Along with the Xbox Kinect, each school received a bank of 20 Intel tablets loaded with carefully selected apps for integrating in learning activities to stimulate and enhance the fine-motor skills required for handwriting execution and quality. Xbox Kinect also enabled the development of fine-motor skills as well as the more obvious development of gross-motor

skills as discussed in the previous chapter. As explained in Chapter Three, the evaluation methodology for fine-motor skills was a pencil and paper test involving the manipulation of the writing instrument. Much time is spent in Foundation Phase practising the fine-motor skills required for handwriting but we were interested to see if the new fine-motor skills required for successful tablet use (such as pinching, stretching, pin-pointing, dragging and tracking) could further improve fine-motor skills as evidenced in handwriting. Grade-specific fine-motor skills were used and assessed using rubrics. Baseline testing was conducted with Grade R and Grade 1 learners in the ten project schools and two control schools in the Western Cape and KwaZulu-Natal provinces over the period of June to September 2014. Results were collected, processed and analysed.

6.2 Our Progress

Teachers participated in workshops focusing on analysing, evaluating and choosing tablet apps to develop fine-motor skills. The teachers were provided with a recommended list of appropriate apps and encouraged to use and customize and develop evaluation tools for app selection. In an early workshop in January 2015, the requirements of CAPS relating to fine-motor skills were analysed and appropriate apps were identified to explore these further. Teachers evaluated a sample app, called TouchGrind BMX and decided it was one of the most effective in targeting fine-motor skills; teachers experimented with their own skills in the game, while having to accept that they would probably crash their BMX bike more frequently than their learners would. The principal of one of the KZN project schools can be seen in this video making a respectable score using this TouchGrind BMX app. <https://youtu.be/YbNs-9mSMbY>



Figure 48: Apps promoting fine motor skills and emotional literacy

While teachers had access to their own tablets in the classroom at all times, the table below shows the frequency of their use of their tablets at work.

Table 7. Frequency of Teacher Tablet Use at Work

| % of teachers using their tablets in the classroom DAILY | % of teachers using their tablets in the classroom WEEKLY | % of teachers using their tablets in the classroom MONTHLY |
|--|---|--|
| 19% | 69% | 12% |

Each school established a timetable to govern the sharing of the tablet bank between the Grade R and Grade 1 classes.

Follow up testing was conducted in the same way at the same schools in June to September 2015. Results were collected, processed, analysed and compared to the previous year. Current Grade R learners were compared with the previous year's Grade R learners. Current Grade 1 learners were compared with previous year's Grade 1 learners. This data provided limited value other than to reinforce teachers' perceptions of their cohorts. What was most valuable was to track the previous year's Grade R learners through to Grade 1 and assess the progress of that same cohort of learners.

6.3 Results

Final assessment of the learners' fine-motor skills was conducted in July to September 2016. Two cohorts of learners were assessed: the 2014 Grade R learners who had been tested in Grade 1 in 2015 and were finally tested in Grade 2 in 2016 (referred to as Cohort 1); and the 2015 Grade R learners who were finally tested in Grade 1 in 2016 (referred to as Cohort 2). Results were collected, processed, analysed and compared to the previous years.

Results were as follows.

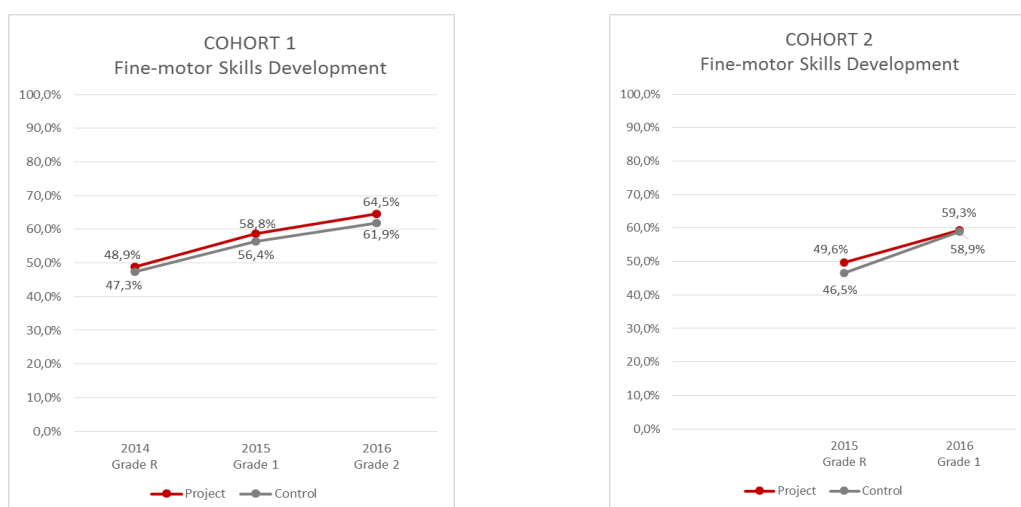


Figure 49: Fine-motor Skills Development for LGP Cohorts 1 and 2

While there is a marginal rise in overall fine-motor skills in the project cohort 1 and the control cohort 2, neither of these are large enough to be considered significant. When considering the specific fine-motor skills, the following tasks were presented to the learners in the test.

Table 8. Fine-motor Skills Tasks

| Grade R learners | Grade 1 learners | Grade 2 learners |
|--|---|---|
| <ul style="list-style-type: none"> • colouring shapes • tracing lines • writing letters | <ul style="list-style-type: none"> • drawing lines • writing letters • writing words | <ul style="list-style-type: none"> • writing letters • writing words • writing sentences |

These tasks were progressive and for each task, learners were assessed on their execution and the quality of their fine-motor skills.



Figure 50: Specific Fine-motor Skills Development for LGP Cohorts 1 and 2

A similar pattern of general improvement can be seen. As seen in gross-motor skill development, the quality of fine-motor skills is poorer than the execution of fine-motor skills.

There were little differences between provinces with Western Cape learners performing slightly better than KZN learners in fine-motor skills.

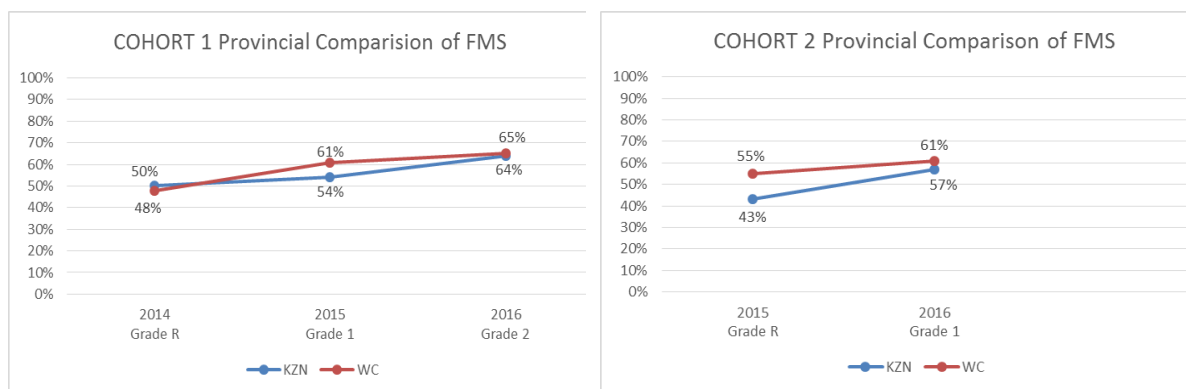


Figure 51: Provincial Comparison of Fine-motor Skills Development for LGP Cohorts 1 and 2

6.4 Discussion

The lack of significant improvement when comparing the LGP project learners performance with the control learners suggests that developing and practising the 'new' fine-motor skills associated with tablet use does not translate into improvements in the traditional fine-motor skills associated with handwriting and drawing.

7. CHAPTER SEVEN – Results & Discussion: Learners' Visual Literacy Skills

7.1 Rationale

The Learning Gains through Play (LGP) project focused on the development and practice of visual literacy 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 were integrated in learning activities to stimulate and enhance visual literacy skills such as visual recognition, visual discrimination, visual interpretation such as sequencing, and visual memory. Emotional literacy was included. Xbox Kinect game consoles with data-projectors engaged learning through play and provided further opportunities to develop, practice and consolidate these important 21st Century skills at the time when learners are at the stage of beginning to make sense of written text.

The visual literacy tests were pencil and paper tests which needed to be carefully administered with these very young children. Tests were grade-specific and focused on visual discrimination and visual interpretation skills required by the CAPS curriculum. Responses were assessed using rubrics. Grade R and Grade 1 learners in the ten project schools and two

control schools in the Western Cape and KwaZulu-Natal provinces wrote their first visual literacy tests in June to September 2014. Results were collected, processed and analysed.

7.2 Our Progress

Teachers participated in professional development workshops focusing on analysing, evaluating and choosing tablet apps to develop visual literacy skills. The teachers were provided with a recommended list of appropriate apps and encouraged to use and customize and develop evaluation tools for app selection. Teachers used their own tablets in class to develop visual literacy skills particularly in class reading sessions. The school timetable governing the sharing of the tablet bank between the Grade R and Grade 1 classes provided weekly opportunities for learners to explore tablet apps on their own or with their peers.

Follow up testing was conducted in the same way at the same schools in June to September 2015. Results were collected, processed, analysed and compared to the previous year.

7.3 Results

Final assessment of the learners was conducted in July to September 2016. Two cohorts of learners were assessed: the 2014 Grade R learners who had been tested in Grade 1 in 2015 and were finally tested in Grade 2 in 2016 (referred to as Cohort 1); and the 2015 Grade R learners who were finally tested in Grade 1 in 2016 (referred to as Cohort 2). Results were collected, processed, analysed and compared to the previous years.

Results were as follows.

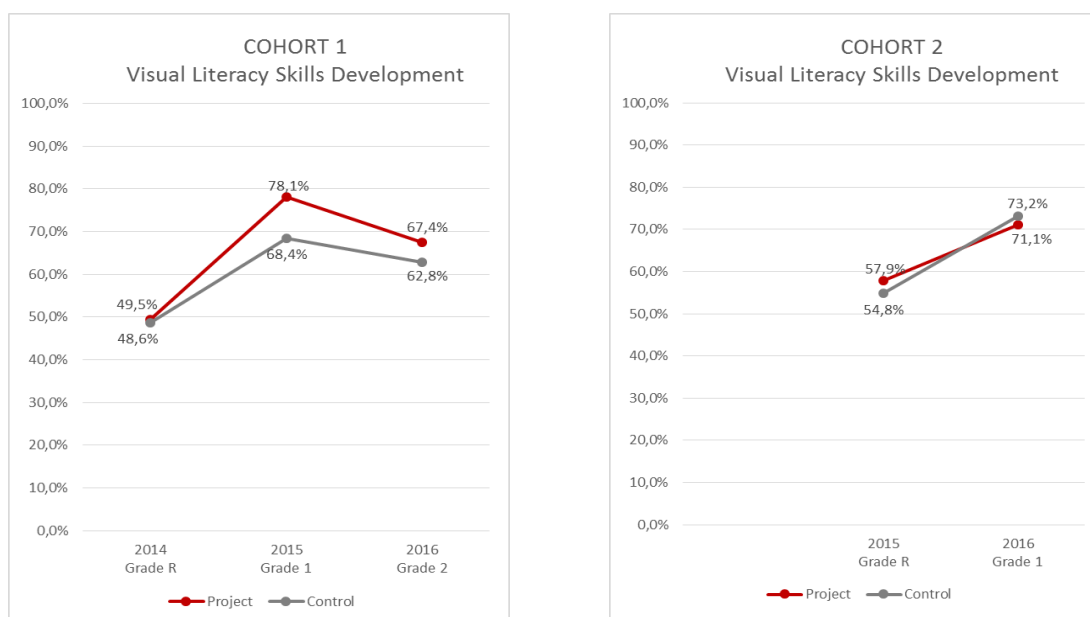


Figure 52: Visual Literacy Skills Development for LGP Cohorts 1 and 2

For Cohort 1 the pattern of development is very similar for the LGP project learners and the control learners. There is an improvement in performance from Grade R to Grade 1 and then a drop from Grade 1 to Grade 2. In the case of Cohort 2 learners, the control learners actually improved more than the project learners. To understand learners' development better, we can consider the specific visual literacy skills separately. Visual discrimination was a skill measured in the visual literacy test using grade progressive questions requiring matching shapes, matching letters, identifying letters, matching words and identifying words.

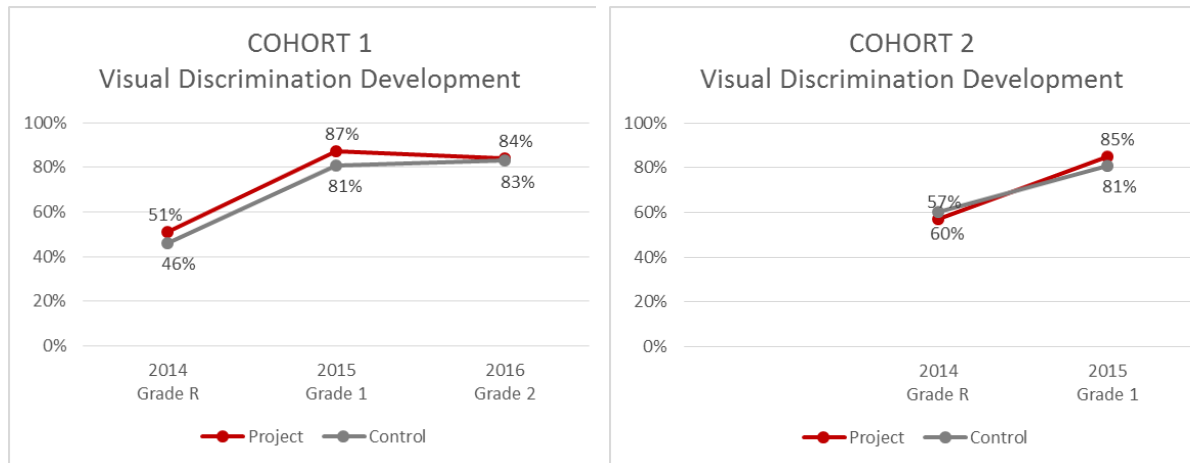


Figure 53: Visual Discrimination Skills Development for LGP Cohorts 1 and 2

The changes in visual discrimination skills over time for both project learners and control learners showed no significant difference.

Visual interpretation was tested specifically through visual sequencing questions of increasing difficulty.

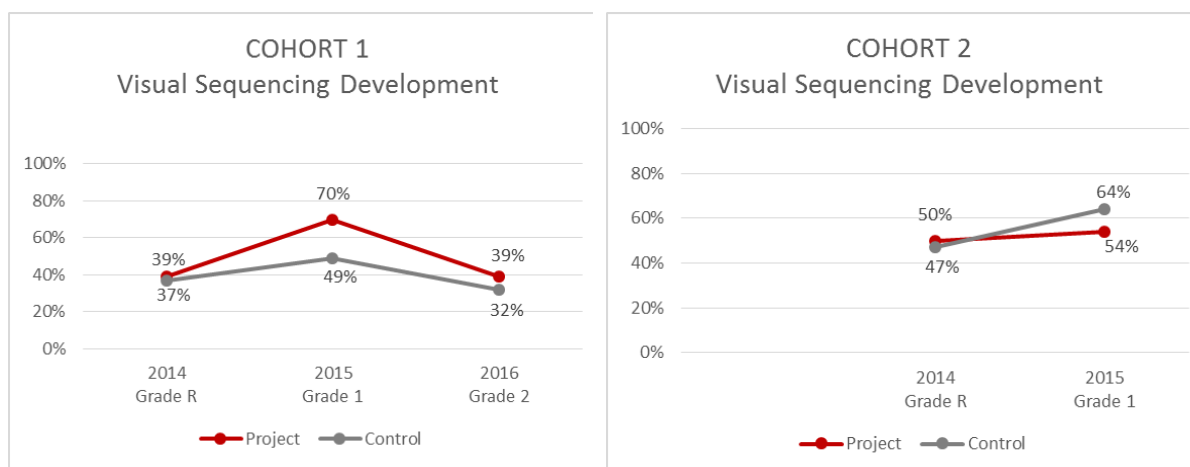


Figure 54: Visual Sequencing Skills Development for LGP Cohorts 1 and 2

For Cohort 1 there was little difference between performance despite the use of tablets apps enabling the development and practise of visual sequencing. In the case of Cohort 2, the control learners actually outperformed the project learners. Visual sequencing posters were evident on the walls of the Grade 1 Western Cape control school classroom when testing was done but despite this the Western Cape control school was outperformed by the KZN control school which did not have such posters in the classroom (as was the case for the project schools). The more concerning possibility was that the use of the sequencing apps may have caused confusion among project school learners causing them to perform more poorly on the visual sequencing test questions. Visual interpretation was also tested with questions involving emotional literacy.

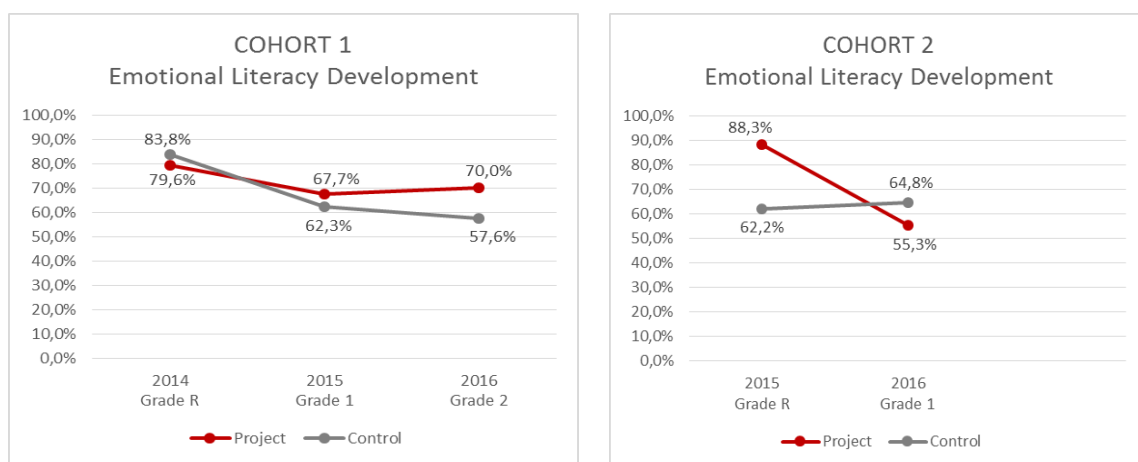


Figure 55: Emotional Literacy Skills Development for LGP Cohorts 1 and 2

For Cohort 1 there appears to be a difference between the performance of project learners and control learners with projects learners achieving higher results for emotional literacy. However Cohort 2 shows the same pattern as in visual sequencing where control learners outperform project learners. This is despite the use of specific tablet apps designed to develop and practise these skills.



Figure 56: Learners displaying their completed instruments for emotional literacy and sequencing

A worrying aspect was an apparent prevalence of incorrect selections made of the emotion, anger. Learner responses were further analysed to confirm this.

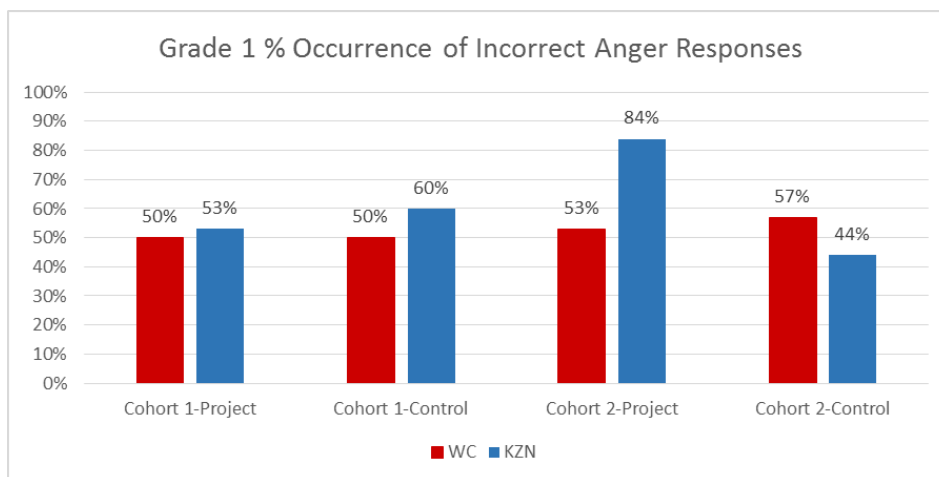


Figure 57: Occurrence of Incorrect Anger Responses among Grade 1 Learners

Only Grade 1 data was analysed. The Grade R emotional literacy test questions did not present any angry options and the Grade 2 emotional literacy test required an angry option choice for a correct answer in one question. Thus only Grade 1 data was analysed for learners in each cohort. Correct responses were discarded and incorrect responses were analysed for the occurrence of anger.

There was a 33% percent chance of any one incorrect answer chosen. In all data-sets, the anger option occurred more often than this, ranging from 44% to 84%. This lowest incidence of anger was among the Cohort 2 control learners in KZN and this highest incidence of anger was among the Cohort 2 project learners in KZN. This is particularly interesting as the control school is within 30 km of four of the project schools and within one kilometre of one of the project schools

When comparing the provincial performance of the project learners it can be seen that no clear difference between provinces is evident.

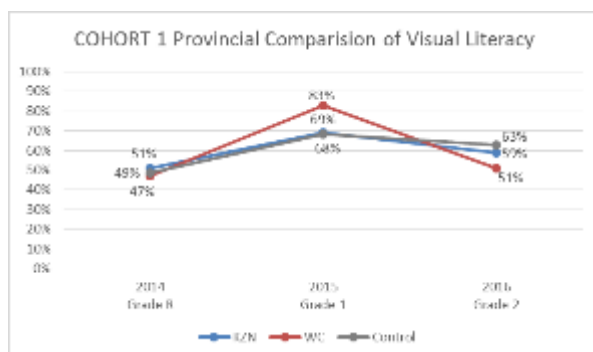
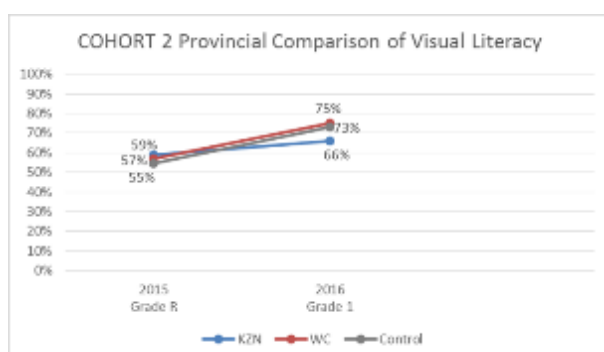


Figure 58: Provincial Comparison of Visual Literacy Skills Development for LGP Cohorts 1 and 2



The Western Cape project learners of Cohort 1 raised the overall project performance a little above that of the control learners, which closely matched the performance of the KZN project learners. The control learners of Cohort 2 in KZN closely matched the performance of the Western Cape project learners. It was the KZN project learners which brought down the Cohort 2 project performance overall in visual literacy.

7.4 Discussion

There is no significant improvement in visual literacy when comparing the LGP project learners' performance with the control learners. This is despite the focused provision and promotion of visual literacy apps to develop these skills of visual discrimination and visual interpretation, in particular visual sequencing and emotional literacy. While general dosage of the use of the tablets and the Xbox was recorded for each school, the frequency of use of these particular apps was not measured. The project focus of learning through play favoured learner-driven use of the tablets including app choice in many cases which made the collection of this data impractical. There was however, anecdotal feedback from teachers indicating that many learners became sufficiently confident to explore and find their own

apps and games. This video provides a clear indication of how teachers learnt to adapt to this new phenomenon of child-driven learning: <https://youtu.be/LV2z2RGlyZ0> Furthermore teachers expressed the view that many apps provided learners with the freedom to be creative,

“.....the benefit of Cup Cakes, it is such a popular app because it gives learners the freedom to be creative in their designs and colour schemes”
Grade 1 teacher in KZN

Comments from teachers were often received that emphasised visual impact such as this from a Western Cape Grade 1 Teacher, *“lots of our children have limited exposure to the world – they know the shop and the beach but lack knowledge of anything further – e.g. a waterfall – or the fire brigade – using technology I can take them outside the class – without actually going out of the classroom – it broadens their horizon – explaining in words about a fire truck is limiting and easy to forget – but they will remember the actual video in action – the video makes it stick”*

8. CHAPTER EIGHT – Results & Discussion: Learners’ Oral English Skills

8.1 Rationale

As English is the language medium for almost all of the tablet apps and Xbox games, one of the components of the research was to measure any acquisition of English oral language that developed as a result of interacting with these apps and games. Language is a major contentious issue in most South African schools. English was the language of learning and teaching (LoLT) in only one of the LGP project schools and this school was not included in the sample. Seven of the ten project schools used mother tongue for instruction through Foundation Phase and then switched to English in Grade 4. It was envisaged that acquisition of English through the use of the tablet apps and Xbox games could make this language transition easier.

As discussed in Chapter Three, the evaluation methodology for oral English skills was a scripted interview test conducted one-on-one with each learner. All verbal responses and non-verbal actions are recorded on task scripts and scored according to rubrics. Results inform on listening and speaking skills. In addition, as learners learning a second language move through five predictable stages: Pre-production (also known as the Silent Stage), Early Production, Speech Emergence, Intermediate Fluency, and Advanced Fluency (Krashen & Terrell, 1983), learner responses from the interview were used to place each learner on the appropriate stage of oral English production.

Grade R and Grade 1 learners in the ten project schools and two control schools in the Western Cape and KwaZulu-Natal provinces were first interviewed in English in June to September 2014. Results were collected, processed and analysed.

8.2 Our Progress

It is important to note that according to the CAPS curriculum, learners learn Language, Mathematics and Life Skills in their home language in Grade R. No other language is expected to be used or taught in Grade R. In Grade 1 learners start learning an additional language along with their home language.

It is important to understand the language protocols in the various schools in the Learning Gains through Play project in order to understand the acquisition of English language results. In KZN, Oral English Skills were assessed in three project schools and one control school. In all four of these schools, the LoLT in Foundation Phase is isiZulu and in Grade 4 there is a switch to English as the LoLT. This is exactly the same situation in the three W-Cape project schools where Oral English Skills were assessed except that the Foundation Phase LoLT was isiXhosa rather than isiZulu. The control school in the W-Cape was different in that it was a dual-medium school. There were three streams in each grade of Foundation Phase, two of which use English as the LoLT and one stream which used Afrikaans as the LoLT. (This was very similar to the remaining two W-Cape project schools however we did not assess Oral English Skills in these particular project schools). This meant that the learners at the W-Cape control school were exposed to English outside of the classroom at school because the majority of learners at the school were English-speaking. Many Afrikaans-speaking learners indicated in their interviews that they spoke both Afrikaans and English at home. This was evident in our 2014 and 2015 results because their achievement in Oral English Skills was much higher than those in all of the other schools tested (and particular their speaking skills). For this reason, our project school results were compared only to the KZN control group who shared the same school language protocol.

When interim results were gathered in 2015, it was immediately evident that there had been significant change in the oral English skills of learners in the project schools when compared to the control schools. In video recordings, teachers frequently expressed the view that apps and Xbox games had extended their learners' English vocabulary but had also helped learners to improve their listening skills and pronunciation.

8.3 Results

Final assessment of the learners was conducted in July to September 2016. Two cohorts of learners were assessed: the 2014 Grade R learners who were tested in Grade 1 in 2015 and were tested in Grade 2 in 2016 (referred to as Cohort 1); and the 2015 Grade R learners who were tested in Grade 1 in 2016 (referred to as Cohort 2). Results were collected, processed, analysed and compared to the previous year.

Results were as follows.

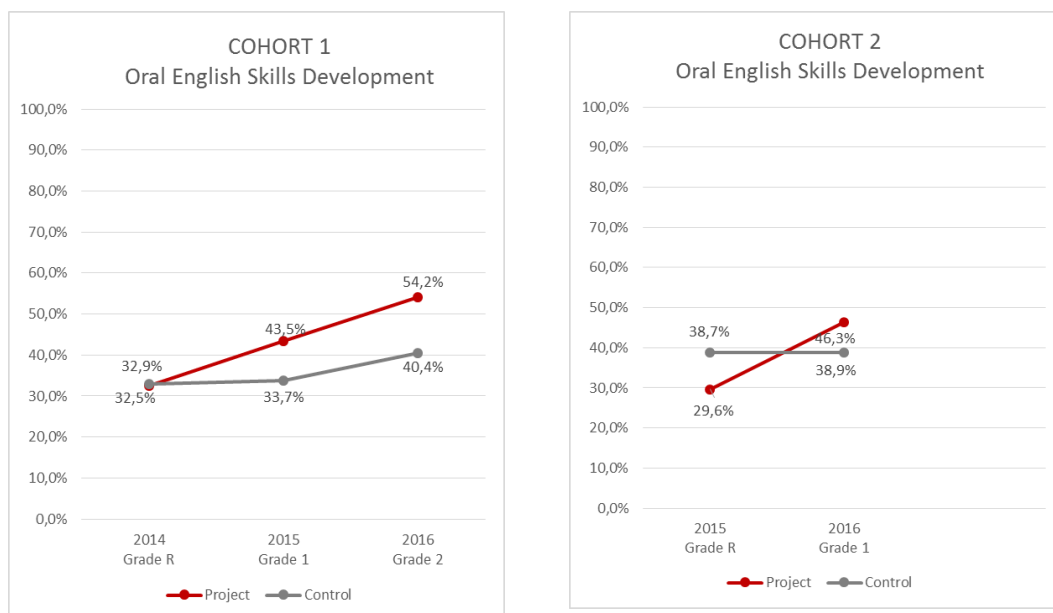


Figure 59: Oral English Skills Development for LGP Cohorts 1 and 2

With both cohorts it was clear that the project learners outperformed the control learners. The Grade R to Grade 1 transition of the Cohort 1 control group learners mirrored 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.

It is interesting to compare the two LGP project cohorts in the different provinces. Cohort 1 in KZN was stronger than cohort 1 in Western Cape. Cohort 2 in Western Cape was stronger than cohort 2 in the KZN. Despite this the pattern of improvement from Grade R to Grade 1

was similar. It is important to remember here that both control group cohorts showed less than one percentile point change from Grade R to Grade 1.

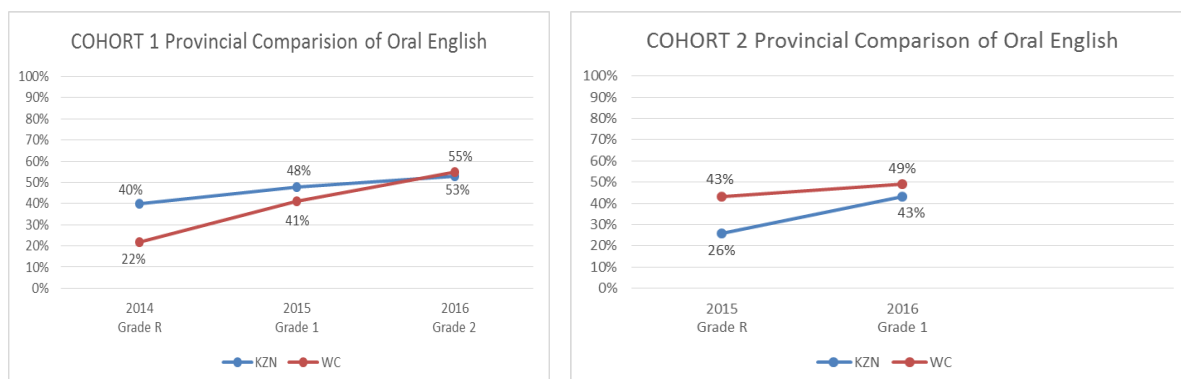


Figure 60: Provincial Comparison of Oral English Skills Development for LGP Cohorts 1 and 2

When considering the specific oral skills of listening and speaking, it can be seen that the regular improvement was evident in both skill types in both LGP project cohorts.

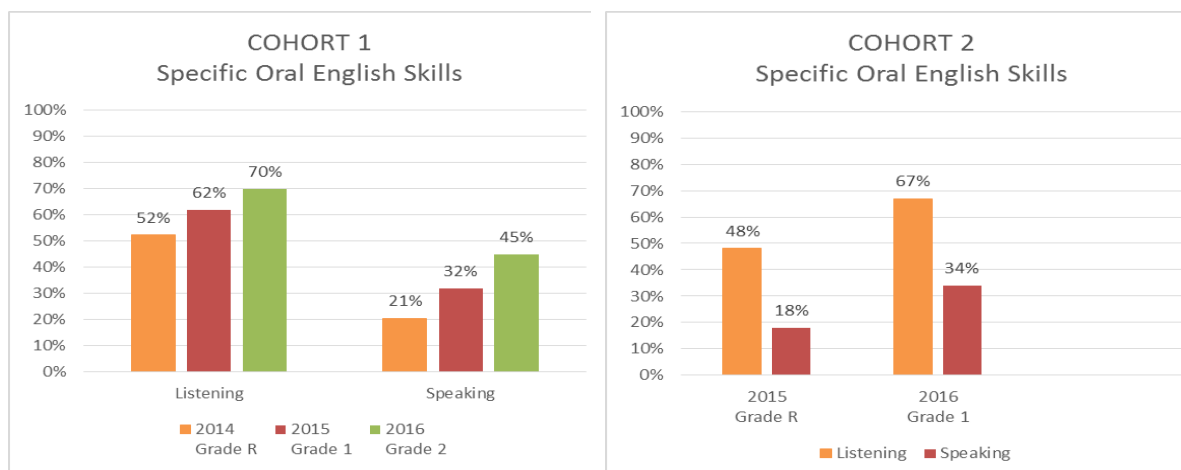


Figure 61: Specific Oral English Skills Development for LGP Cohorts 1 and 2

A steady improvement in both listening and speaking skills over the progressive grades was measured with a larger regular improvement in speaking skills. Speaking performance more than doubled over the two successive grade measures. Again an improvement was measured from Grade R to Grade 1 in both listening and speaking skills. Again a larger improvement was evident in speaking skills. Speaking performance almost doubled over only one grade measure. When the learners were assessed on the Second Language Acquisition Stages, their progress became even clearer.

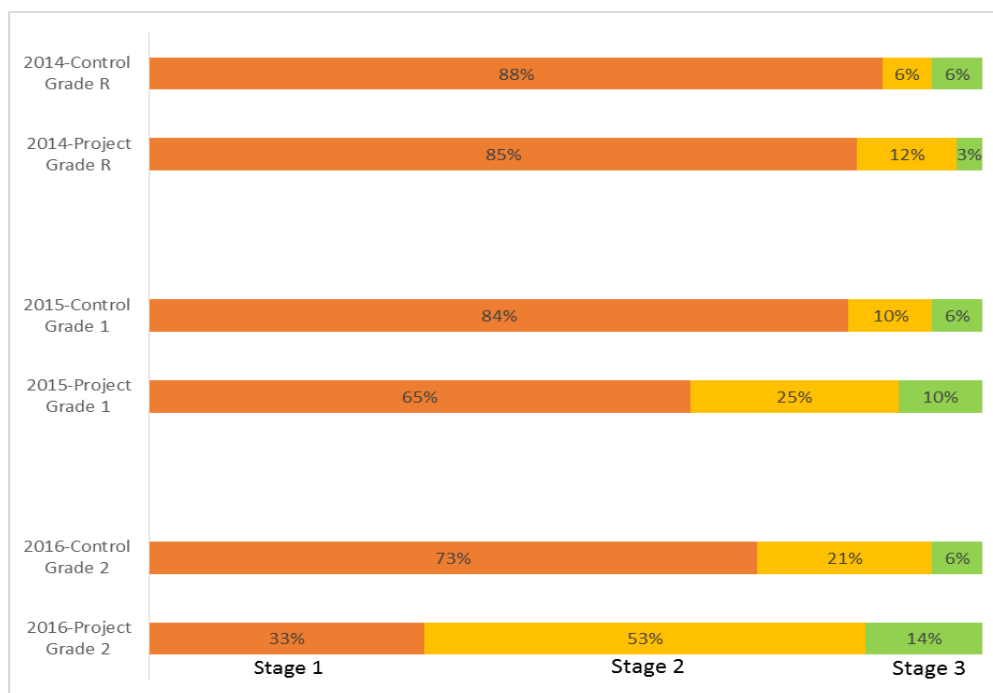


Figure 62: Percentage of Learners on Krashen's SLA Stages 1-3 for LGP Cohort 1

When considering Cohort 1's control group, it could 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 progressed to Stage 2 leaving 84% of learners still on Stage 1. The Stage 3 learners had not made any progress. After the next year, a further 11% of learners had progressed from Stage 1 to Stage 2. The original Stage 3 learners had still not made any progress. At the end of the test period, just over a quarter of the learners were 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 progressed to Stage 2 (five times as many as the control group), 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 were above Stage 1.

Cohort 2 data showed a similar pattern of a much larger improvement among project schools learners compared to control school learners.

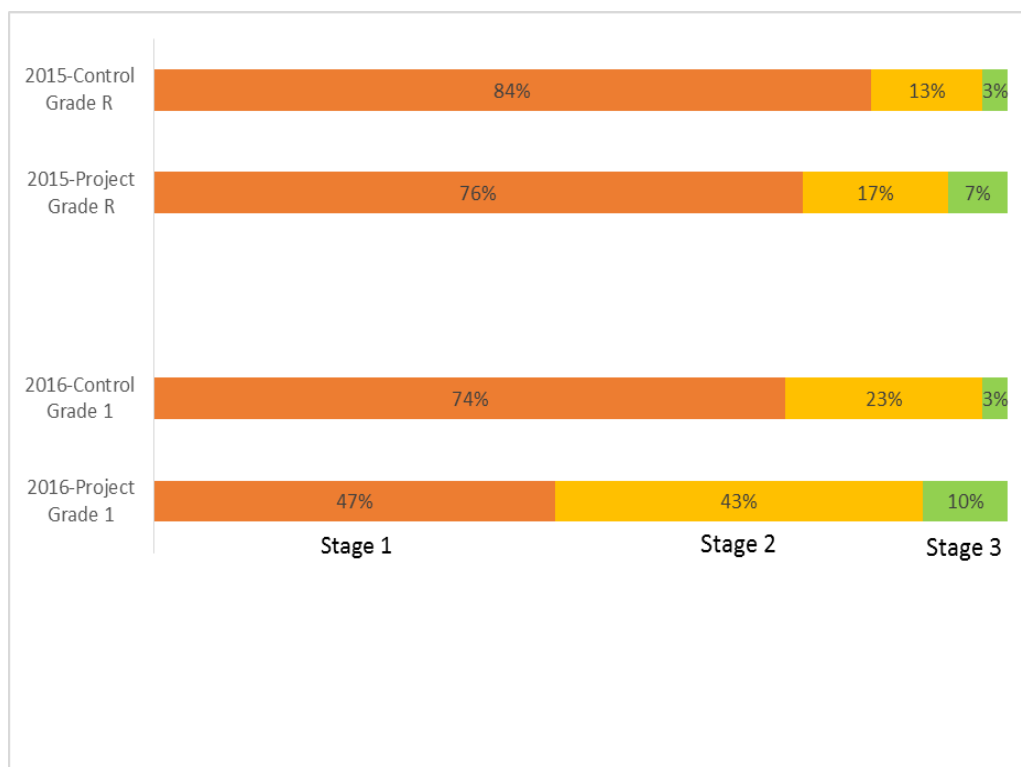


Figure 63: Percentage of Learners on Krashen's SLA Stages 1-3 for LGP Cohort 2

The starting situation for the control school group in Cohort 2 had 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 had progressed from Stage 1 to Stage 2. The learners on Stage 3 had remained on Stage 3.

Comparing the control group with the project group reveals the following. At the start, 76% of the Grade R learners in project schools 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 (almost three times as many as the control group) and 3% progressed from Stage 2 to Stage 3. This resulted in less than half of the learners being 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 of 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 showed the same trajectory of improvement off SLA Stage 1 for both cohorts.

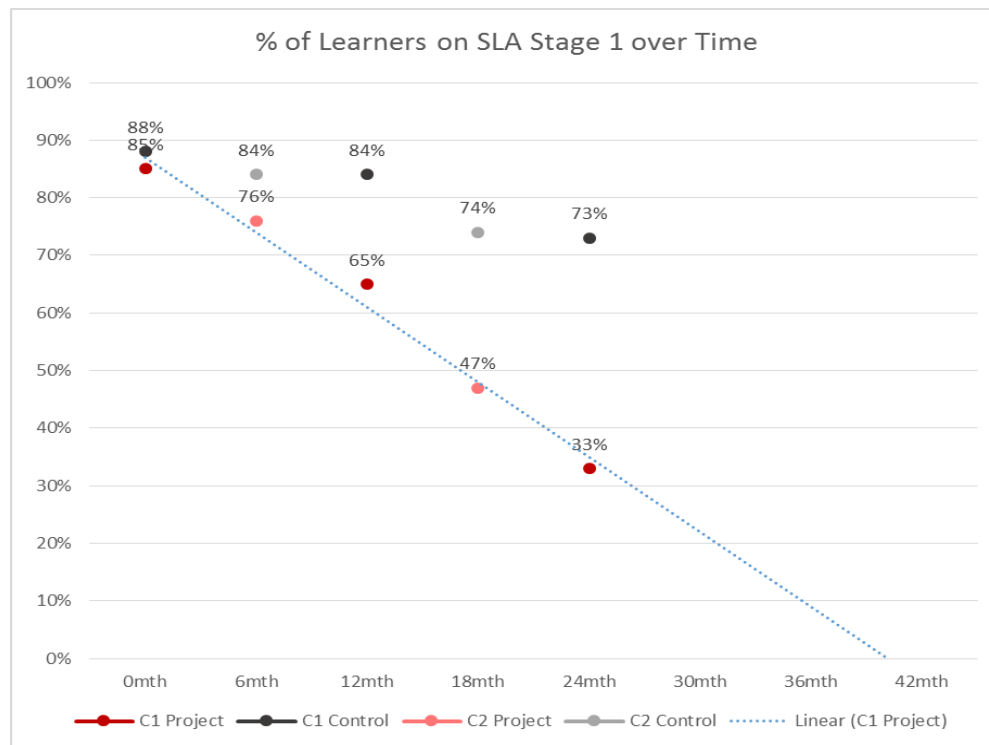


Figure 64: Predicted Percentage of Learners on Krashen's SLA Stage 1 over Time

The data predicted 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 provided a massive opportunity for preparation to learn in English in Grade 4.

8.4 Discussion

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 went 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 most important finding for the

Learning Gains through Play project is that Oral English skills can be improved simply by engaging with the tablet apps and video games which use English as the medium of communication. With this has come further questions:

- 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?

A limited extension of the LGP project to conduct oral English assessments with the same project and control learners in July 2017 may shed more light on these questions.

9. CHAPTER NINE – Results & Discussion: Teachers' Teaching Practice

9.1 Rationale

Baseline testing of teachers at the start of the project was by means of self-assessment. Teachers completed questionnaires individually answering questions on their classroom practice. They were required to:

- draw a sketch of their classroom environment and identify the location of different learning activities;
- indicate the percentage of working day time spent interacting with the whole class, small groups, individual learners and teaching colleagues;
- identify teaching methods employed and the frequency of these in whole-class activities, small-group activities and individual activities; and
- identify learner actions and the frequency of these over the course of the grade year.

While aspects of the information shared around classroom practice was interesting, the data appeared unreliable, as in most cases, all options were selected as occurring with a daily frequency. This would be practically impossible. It was therefore decided to adopt a retrospective self-assessment approach to be conducted at the end of the project period. We

found that after improvement, teachers were more confident to discuss the weaknesses in their teaching skills than at the start of the project.

9.2 Our Progress

All Grade R and Grade 1 teachers from the ten project schools in both provinces attended clustered training sessions at central venues. There were 53 teachers in total, 30 in the Western Cape and 23 in the KwaZulu-Natal. Initially they completed the ICT4RED Teacher Professional Development with Tablets Course. This course covered new and innovative teaching strategies for embedding the use of technology in classroom teaching and learning. Modules included Jigsaw Cooperative Learning, Story-telling, Role-play, Learning Stations, Mind-mapping, Field Trips, Gallery Walks and Reflective Practice as well as a Games-Based Learning module specifically focusing on the effective use of the Xbox Kinect designed for the project by our games-based learning expert. In 2015, teachers completed a customized course with modules exploring tablet apps and Xbox games for Foundation Phase development of gross-motor skills, fine-motor skills, visual literacy, emotional literacy, numeracy and oral English language skills. The focus of each workshop was to link the apps and games to the CAPS curriculum and to promote teaching opportunities and stealth learning through the use of the technology. Further workshops involved sharing the learner assessment data with teachers and analysing this in school groups to identify strengths to build on and weaknesses to address. The monitoring data was used to empower teachers to implement data-driven practice in their schools at a classroom level. Workshop dosage was deliberately incremental, allowing for ongoing classroom visits and teacher support from the project team. Later in 2015 a Peer-mentoring Course was added to strengthen the support for the use of technology in the classroom in each school. One of the aims of peer coaching was to engender a culture of ongoing staff development and thus sustain the change after the project has ended.

9.3 Results

Teachers each completed an individual and anonymous retrospective teaching practice questionnaire at the end of the project. The questions focused on three areas of professional development: teaching skills of classroom management, curriculum and content knowledge and pedagogical skills. Teachers were required to rate their own performance on each of these criteria at the start of the project (in June 2014) and at the end of the project (in November 2016).

Results were as follows.

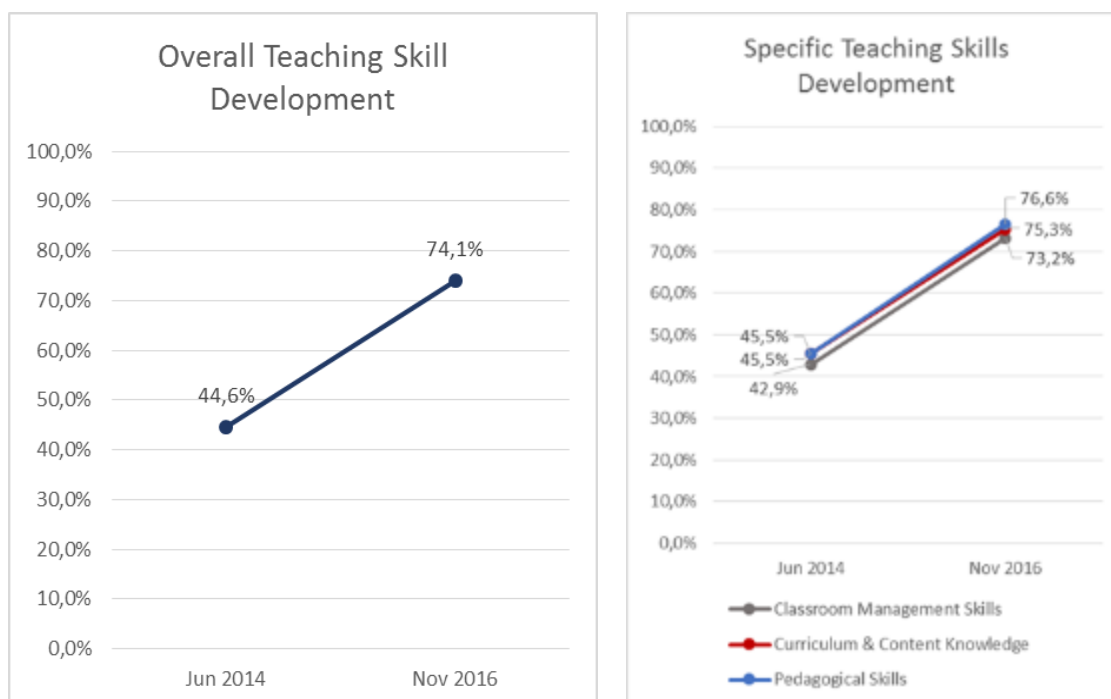


Figure 65: Overall and Specific Teaching Skills Development

Overall teaching skills improved by 29.5% with teachers commenting that the workshops had presented new strategies in teaching for them to use and had increased their creativity in the classroom. A number of teachers commented on their improved classroom management skills since using the tablets in class and the ease with which the tablets enable differentiated activities for both stronger and weaker learners.

Comments such as:

"it increases my knowledge ...the new skills motivate me ...my work is done much easier".

"I am more open to learn new skills and like to share it with my colleagues. I regularly try out new things and I learn to explore on my own."

"I have learned that if I am not sure of how to introduce new concept to the children, to Google and find interesting ways of introducing and teaching a concept."

"Apps for CAPS actually helped to enhance my teaching practice in terms of making my learners enjoy learning through play."

When considering the individual teaching skills of classroom management, curriculum and content knowledge and pedagogical skills, a very similar pattern of improvement over time can be seen which is reflected in the overall teaching skill development graph too.

It is interesting to compare the teachers from the two separate provinces of KwaZulu-Natal and the Western Cape. KZN teachers rated themselves more poorly at the start of the project and more favourably at the end of the project than the teachers in the Western Cape.

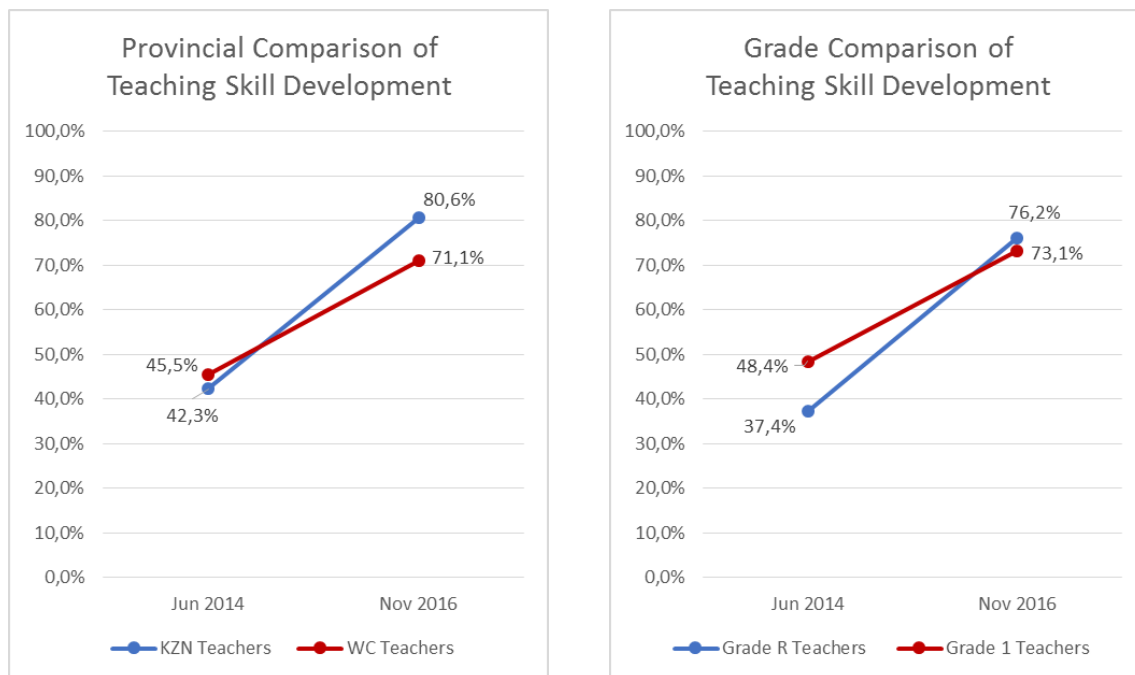


Figure 66: Overall and Specific Teaching Skills Development

When comparing Grade R teachers with Grade 1 teachers (both provinces included) it can be seen that the Grade R teachers rated themselves more poorly at the start of the project and more favourably at the end of the project than the Grade 1 teachers. Grade R teachers rated their change in performance at more than double that at the start. To understand this change we gained more insight from the case-study interviews, when Grade R teachers made it clear that they felt that the project had validated their role in Foundation Phase and provided affirmation of the value of play in teaching and learning.

9.4 Discussion

The teachers' perceptions of their teaching skills was that they improved significantly over the course of the project. The magnitude of the improvements were surprisingly consistent across the three identified criteria (classroom management skills, curriculum and content knowledge and pedagogical skills) and across the cohort of teachers from the ten schools in two provinces and teaching two different grades. It is clear that the use of the technology in the classroom did not just improve learning for learners or just the technology skills of the

teachers but it also improved the teachers' perceptions of their core teaching skills and changes in their teaching practice.

10. CHAPTER TEN – Results & Discussion: Teachers' Technology Skills

10.1 Rationale

At the start of the project, each teacher completed a questionnaire focusing on their experiences and expertise in using computers, tablets, mobile phones and the Xbox Kinect.

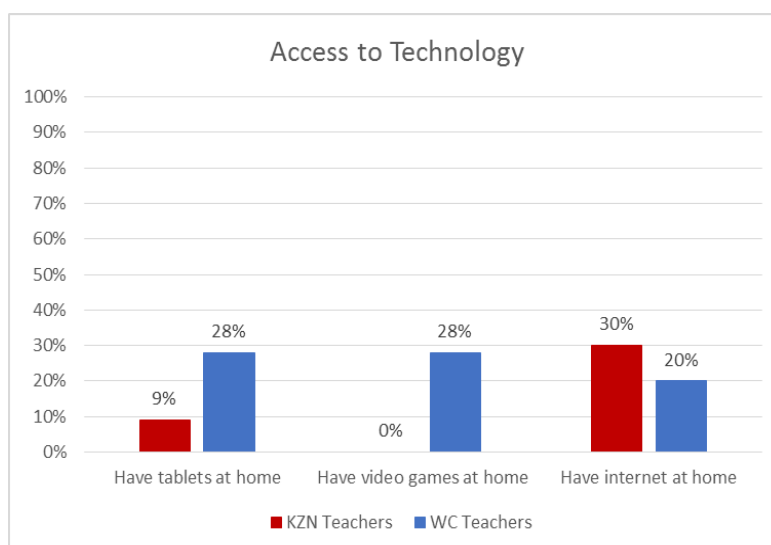


Figure 67: Baseline Teacher Access to Technology Access

Very few teachers had access to technology at home. In fact in KZN, no one had any video game console at home. Data gathered from the learners showed more access and more experience with using tablets and playing video games. Teachers' self-assessments of their tablet skills were low with the majority never having used a tablet or not being skilled at all. This included all of the KZN teachers and more than two-thirds of the Western Cape teachers.

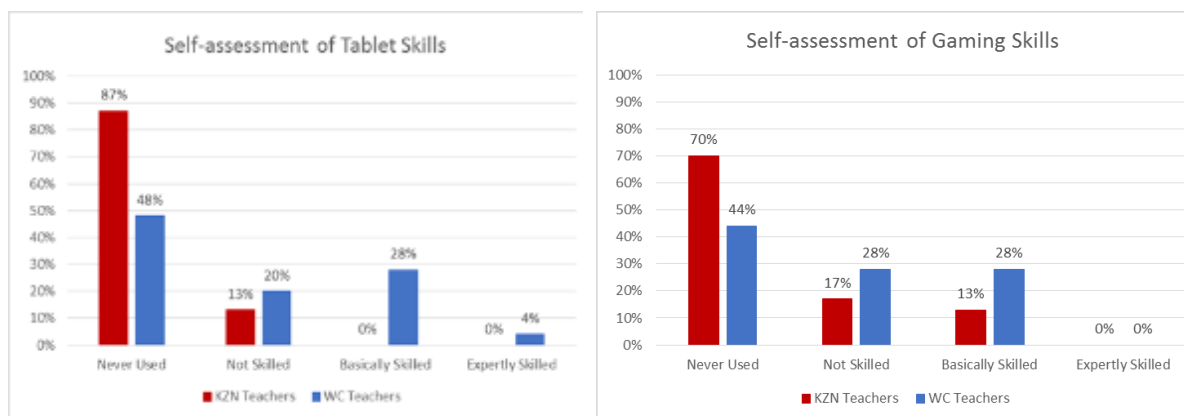


Figure 68: Baseline Teacher Tablet Skills and Gaming Skills Levels

A similar situation was evident with video gaming although there was a small percentage of KZN teachers who had basic skills in playing video games.

Interestingly, despite the lack of experience and the maturity of the teachers, they were positive about the potential benefits of using technology in the classroom. Teachers were asked to respond to the following statements either in agreement or disagreement.

Using technology in the classroom can:

- make me a better teacher;
- make my teaching work easier;
- make my administrative work easier;
- make my learners understand better;
- make my learners achieve better results;
- make my learners enjoy my lessons more;
- make me enjoy my teaching job more.

The percentage agreement ranged between 92% and 100% except for the last statement which had the lowest agreement of 84%. Bearing in mind the teachers' lack of experience with technology and their poor rating of their own technology skills, this might not have seemed surprising except that 84% was a very large agreement and that was definitely surprising.

10.2 Our Progress

Each of the teachers received his/her own personal tablet, (a Samsung Galaxy 10.1) in June 2014. Initial teacher development workshops, while focusing on teaching strategies with the technology, also involved training in the use of the tablets. Teachers had four months to learn,

practice and experiment with their own tablets before the schools received the learner tablets and before the teachers would need to supervise the learners working with their own tablets in their classrooms. This was an important benefit as most teachers had time and support to master the technology before needing to assist learners in the classroom.

Workshops provided opportunities to introduce the teachers to useful apps, to develop tools for analysing the suitability of new apps, and to share ideas of how different apps could be used to meet the curriculum outcomes. While the project focus was on free apps, it was encouraging to see teachers being able to evaluate apps and then personally investing in the purchase of apps they particularly valued. While initially teachers tended to use the tablet apps as learner rewards or time occupiers for learners who finished early, later classroom visits showed teachers basing their lessons around the use of specific apps to develop concepts and consolidate learning.

10.3 Results

Teachers each completed an individual and anonymous retrospective technology skills questionnaire at the end of the project. The questions focused on the use of the tablets and their apps and the Xbox Kinect and its games. Teachers were required to rate their own performance of these technology skills at the start of the project (in June 2014) and at the end of the project (in November 2016).

Results were as follows.

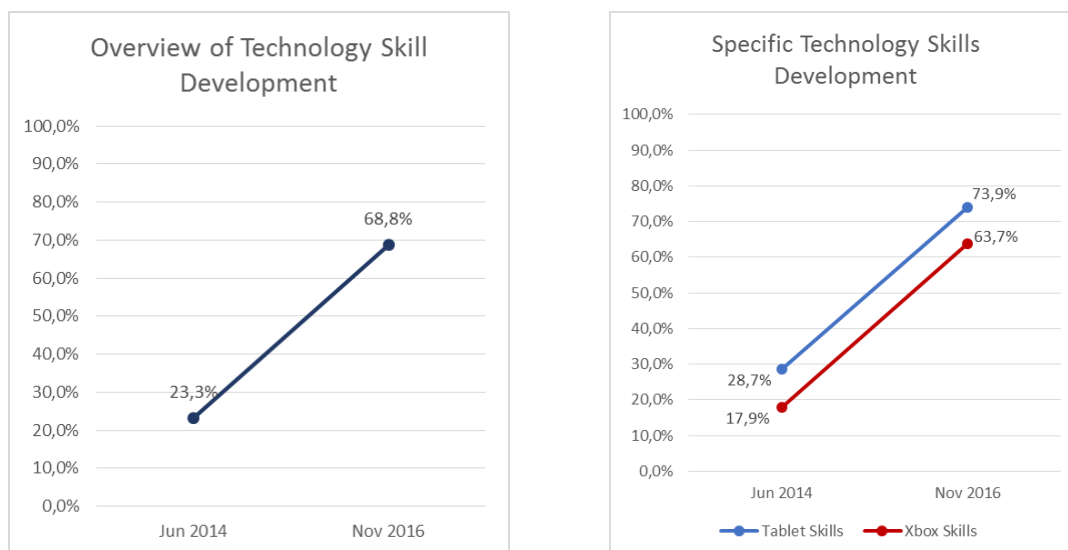


Figure 69: Overall and Specific Technology Skills Development

Initial technology skills were extremely low, which is confirmed by the baseline data gathered at the start of the project. Overall technology skills improved by a remarkable 45.5 percentage points. Many teachers commented that their confidence to work with technology had grown and that the technology had improved their lives at home as well as at school.

Comments such as:

“Technology helps to widen our minds and those of the young ones. It causes someone to be independent. It opens the doors to explore.”

And

“We are in the 21st century now so technology is very important. The project has groomed me so much – I’m not shy any more with my tablet.”

“I can confidently use the tablet e.g. creating an email, opening an email, playing games, working in apps, installing and uninstalling apps and more skills that I have learnt. This is very valuable to my work and daily life as it makes my life easy.”

“I now try to learn on my own by playing with my tablet.”

“I have learned to consult my tablet for teaching resources.”

“.. I am 52 years old and had never touched a tablet before the project came to the school. Now I am using it all the time and for everything such as email, taking photos and videos. I really enjoy making collages of photos.”

“Now I have experienced technology, it is part of my life.”

When comparing teachers’ tablet skills with their Xbox skills the pattern of improvement was similar although the level of Xbox skills was lower.

This finding made sense considering that the teachers had their own tablets which they took home with them and also used for personal reasons while each school initially only had one Xbox which was always kept on campus.

As was the case with teachers’ self-assessments of their teaching skills, the KwaZulu-Natal teachers rated themselves more poorly at the start of the project and more favourably at the end of the project than the teachers in the Western Cape.

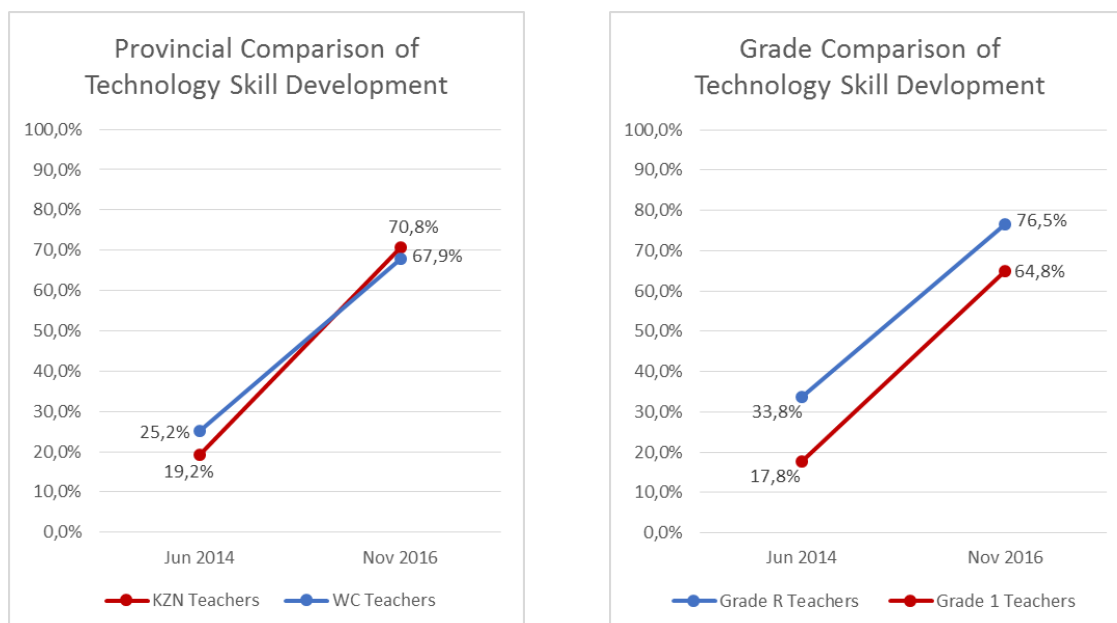


Figure 70: Provincial and Grade Comparisons of Technology Skill Development

Both groups of teachers recorded large improvements in skills – 52 percentage points up in the case of the KZN teachers.

Grade R teachers rated their technology skills more favourably than the Grade 1 teachers did (in both provinces). The reason for this could be attributed to the fact that Grade R teachers were more frequent users of the Xbox than their Grade 1 colleagues and therefore gained more competence through familiarity.

In both cases, teachers rated improvements as large – 43 percentage points increase for Grade R teachers and 47 percentage points increase for Grade 1 teachers.

10.4 Discussion

The teachers' perceptions of their technology skills was that they improved significantly over the course of the project. The magnitude of the improvement in tablet skills was larger than Xbox skills and was most likely due to the fact that the teachers had exclusive use of their own tablets while staff shared an Xbox which was secured on the school premises at all times. A key factor which could account for improved technology skills was that the teachers had access to the technology four months before they were required to use it in their classrooms. This gave them time to master the technology and build up their confidence in demonstrating the apps and games to the learners in their classroom. Another key factor was that teachers were encouraged to use their tablets for more than their work activities. They were guided in setting up Gmail addresses, WhatsApp chat groups, Facebook accounts, and to take photos

and videos. This added value to the tablet technology and embedded its use in their personal lives too.

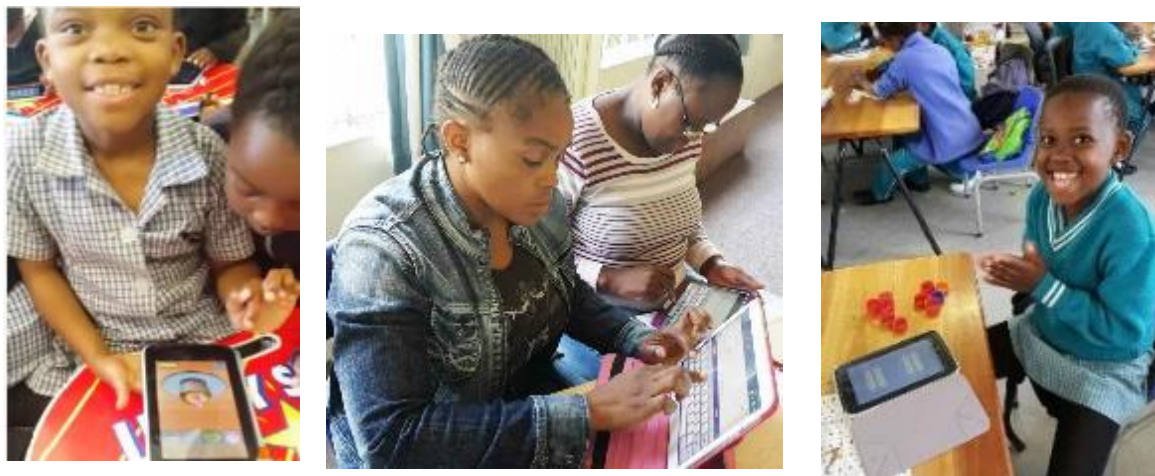


Figure 71: ICT skills using tablets

Not only did the LGP project use games and learning through play as a vehicle for learning but a key factor in the design of this project, was an element of gamification built into the professional development strategies in the form of badging for the teachers. In turn teachers were expected to apply gamification models in their classrooms for their learners. In order to “earn” badges, teachers in the LGP project had to prove they had matched the criteria by showing evidence such as videos, digital mind maps of learning topics, photos of learners using the teaching methodologies from the course, and photos of learners’ work. Evidence of the effective use of the teaching strategies resulted in the accumulation of badges for the staff as a whole, which in turn resulted in rewards for the school, which in some cases included a further Xbox Kinect.

There were some drawbacks with gamification that we wished to avoid. Firstly, collecting evidence from teachers could be a cumbersome process and particularly labour intensive if the evidence was in the form of a video and required transfer to the badge assessor’s device from the teacher tablet. In the LGP project therefore we decided to process badge evaluation online. So teachers logged on to the website and submitted their artefacts there. They uploaded their videos to YouTube and shared the link on the website. The badge assessors could then view the evidence online and provide feedback. The evidence gave an instant indication of whether the teacher had understood the criteria. Once evidence was approved then the badge was automatically issued to the teacher through *Credly*.

Another shortcoming in the badging process that we wished to avoid was that teachers can be highly motivated to master skills in order to achieve badges but did not always apply those skills in the classroom. To combat this tendency we designed badges in the LGP project that required evidence of classroom implementation. This instantly indicated whether the teacher

has understood the teaching strategy that had been work-shopped and gave the opportunity for remediation if necessary.

11.CHAPTER ELEVEN – Results & Discussion: Teachers’ Attitudes

11.1 Rationale

As already mentioned in the previous chapter, at the start of the project teachers expressed surprisingly positive views of the use of technology in education in the light of their lack of experience and self-rated low levels of technology skills. Motivation and confidence was not directly measured at the start of the project however this did form part of the retrospective teaching survey.

The daily pressure to cover the national curriculum at a rigidly prescribed pace was a preoccupation that teachers regularly mentioned at the start of the project. They felt that the situation left little room for play, exploration and discovery nor for practising and reinforcing fundamental skills that often require more time. They thought that playing required extra time so there was an inevitable resistance to plan for play as well as a concern that play was regarded as frivolous. A very positive finding from the project was that teachers felt the project had given credibility to the Foundation Phase but had also dispelled the myth that playing was not learning. This belief had been evident towards the end of the first year of the project, when the Head of Department at a KZN school expressed the view that her teachers were very busy; they were successfully achieving the outcomes of CAPS and did not have time to play. Subsequently, teachers gradually came to realise that activities using technology could readily achieve the CAPS outcomes, rather than being something that detracts from vital instruction time. This realisation was an important fact that had taken time for teachers to grasp but once understood, they said that “technology integration had become second nature”.

Teachers’ pedagogical beliefs played a major role in their eagerness to use technology, often resisting technology use because they believed that learners could only learn to write if they touch and hold a pencil. This belief prevailed in a few teachers even after significant gains had been found in using apps that allowed learners to trace letters on the screen with their fingers. During the March 2016 workshop, after SchoolNet’s team visit and their encouragement, teachers said they were amazed how letter tracing apps had assisted learners with their writing skills and particularly those learners who had struggled to hold a pencil. Teachers confessed that they had not believed this possible and subsequently felt guilty that they had been disadvantaging their learners all through the first term.

“I couldn’t believe it when one of my learners, who is repeating the grade - and who couldn’t write her name for the entire year - but having used Big Fat Canvas App - for the first time - was able to do so, instantly.”

11.2 Our Progress

A growing enthusiasm for the use of the technology was observed by the project team at the workshops and on class visits. Uptake by teachers varied with some early adopters, most taking it on after personal successes in the classroom and a few ‘oldies’ struggling with the technology but trying not to be resistant to change. Peer-mentoring helped a lot to spread the expertise and enthusiasm at the individual schools.

A number of teachers recommended the tracing apps for accelerating the learning of those facing challenges:

“... their fingers just follow the shapes ... highlighting pathways and it forms a letter – children who struggle to write and who cannot grip a crayon – much easier with their finger - still learn the letter even though they don’t know how to control a pencil

Especially the learners who struggle – it helps their self-confidence – if they do it wrong, they can start again and nobody judges their mistakes – because it erases”

Even the preoccupation with completing the curriculum was overcome once teachers realised that the project aims were aligned to CAPS and by undertaking digital activities could assist in achieving the outcomes:

“Now it is understandable that this achieves the outcomes for CAPS but early on it seemed like an additional add on - In a couple of weeks it becomes a routine – becomes part of learning – and children no longer become too excitable”

The badging programme was effective as an incentive for teachers to earn rewards for themselves personally, as well as for their schools. This comment from one of the badge assessors indicated a high level of engagement from many of the project teachers. However, for many of the teachers the uploading of their work for the badges was a low point. There were complaints about how difficult and time-consuming it was and very often the responsibility fell on the shoulders of the few tech-savvy teachers in each school.

“When we started this project most of these teachers knew very little about technology and its integration within teaching. They could not even send or receive email and had never used the internet before. When they now submit their badges online, they are compelled to use the internet. Through the use of the internet, they have learnt to email and upload videos to YouTube. They regularly check their email now and they also visit the LGP website to check how they have fared with their badges. We would not have achieved this, had we not gone the online route. They are not the same teachers we met in July last year. Furthermore, the

assessor does not have to go to school to collect badges and disturb classes. The teachers can submit anytime, anywhere."

11.3 Results

Teachers each completed an individual and anonymous retrospective attitudinal questionnaire at the end of the project. The questions focused on their motivation for their work, their self-confidence in their work and their perceptions of the confidence their SMT and colleagues had in them in the classroom. Teachers were required to rate their attitudes at the start of the project (in June 2014) and at the end of the project (in November 2016).

Results were as follows.

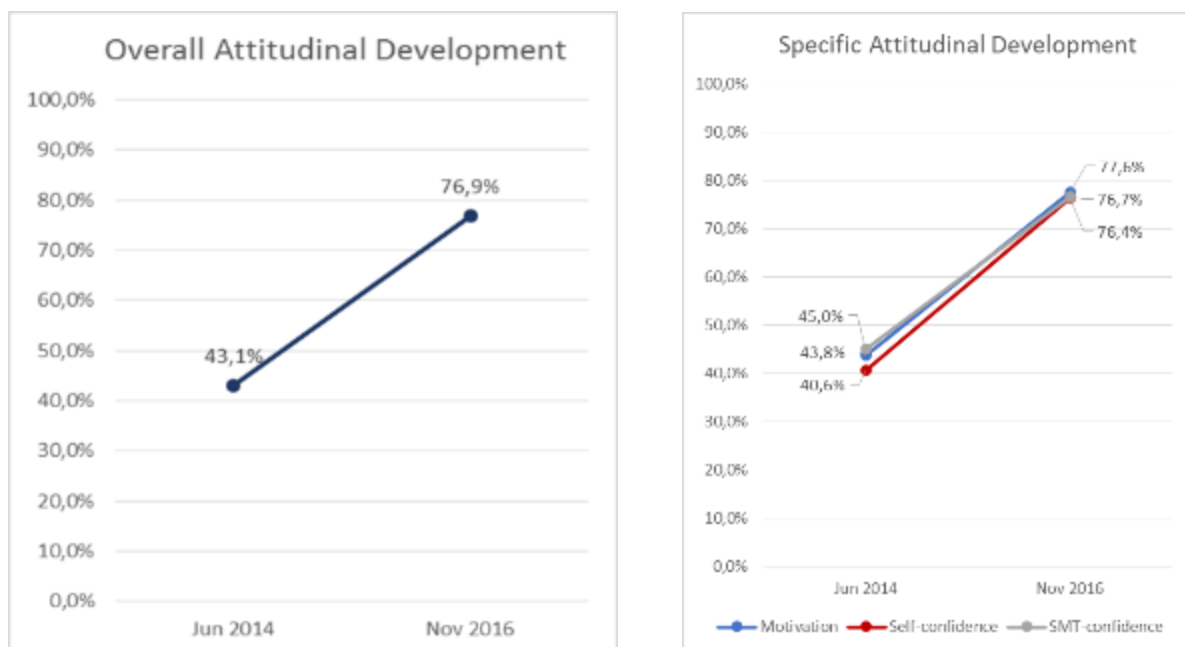


Figure 72: Overall and Specific Attitudinal Development

Initial ratings were low but a large improvement in ratings was recorded overall. Teachers commented on their increased confidence not only in teaching and using the technology but especially in speaking publicly, engaging with their colleagues and working with other teachers from other schools.

When comparing teachers' specific attitude changes, a similar pattern is seen. It is interesting that teachers rate their own confidence in themselves lower than the confidence they feel their SMT and colleagues have in them.

As is the case with teachers' self-assessments of their teaching skills, the KwaZulu-Natal teachers rated themselves more poorly at the start of the project and more favourably at the end of the project than the teachers in the Western Cape.

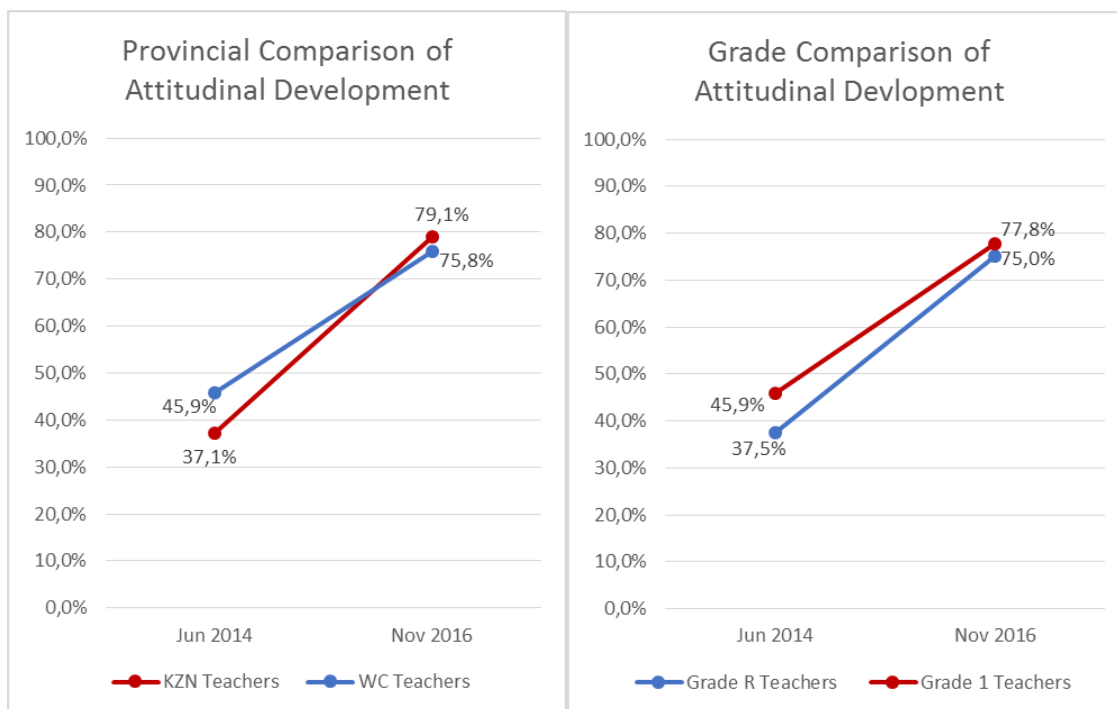


Figure 73: Provincial and Grade Comparisons of Attitudinal Development

In contrast to the other teacher measures, in these it was Grade 1 teachers that rated their attitudes more favourably than the Grade R teachers did (in both provinces). However the Grade R teachers recorded a larger improvement than the Grade 1 teachers.

11.4 Discussion

Teachers' self-rated attitudes of motivation and confidence improved significantly over the course of the project. Again it was the early arrival of the teachers' tablets that provided confidence when demonstrating the use of technology to their learners. Opportunities to present their classroom experiences at numerous education conferences over the past two years has also been a motivator. While teachers commented not on their own increased motivation, they also have identified the use of the technology as a motivating factor for their learners. While it is difficult to attribute increased attendance at school to the use of tablets and the Xbox in the classroom, the teachers participating in the project have voiced that opinion regularly over the duration of the project.



Figure 74: Conference Presentations by project teachers

12.CHAPTER TWELVE – Results of Teacher Case-Studies

12.2 Summary

The selection of teachers for conducting case studies was difficult because there were so many potential subjects. Furthermore, the researcher and the whole project team had become very familiar with individual teachers over the three years of the project and there appeared to be enough material to write a thesis on almost all of the teachers.

Eventually the sample was finalised, ensuring a diversity of subjects, including both young teachers as well as those who were new to technology and perhaps older in years and yet embracing new technologies with enthusiasm.

Interviews for individual teacher case-studies were conducted during December 2016 in Western Cape and during January 2017 in KwaZulu-Natal. The case-study sample was distributed thus:

Table 9. Teacher Case-Studies Sample

| Code of Teacher | Grade Teaching | School | Province |
|-----------------|----------------|--------|----------|
| Teacher A | Grade 1 | A1 | KZN |
| Teacher B | Grade R | A3 | KZN |
| Teacher C | Grade R | A3 | KZN |
| Teacher D | Grade R | A4 | KZN |
| Teacher E | Grade 1 | B3 | WC |
| Teacher F | Grade 1 | B3 | WC |
| Teacher G | Grade 1 | B4 | WC |
| Teacher H | Grade 1 | B5 | WC |

Care was also taken to ensure that the sample of case-study teachers came from schools that were spread across both provinces as well as rural, urban, township and farm schools.

As can be seen from the selected responses, reported below, almost all of the Foundation Phase teachers expressed their great love of children as their main reason for becoming teachers. This distinguishes them from teachers of other phases; this is not usually the immediate response from high school teachers or even Intermediate Phase teachers, who tend to focus more on their subjects as having drawn them into the profession.

A common thread expressed by Grade R teachers was that their work was extremely important but not fully appreciated by the successive grade teachers. Some of the Grade R teachers argued that even with advanced studies, they would still choose to remain teaching Grade R. This was expressed almost to highlight just how important they felt Grade R was. Some of the Grade R teachers were highly qualified. They too would argue that Grade R was their preference above teaching higher grades, which might be perceived as being more prestigious by the higher grades' teachers.

All teachers were asked the following, semi-structured, evaluative interview questions:

LOOKING BACK

- Why did you become a teacher?
- How did you become a teacher?
- What kind of a teacher were you at the start of the LGP project (2014)?

LOOKING IN

- What personal strengths do you bring to your teaching work?
- What personal weaknesses do you manage in your teaching work?
- How did the LGP project affect you personally?

LOOKING OUT

- What is your school community like: colleagues, management, learners, parents?
- What opinions and feedback did you receive about the LGP project from your school community?
- How did the LGP project affect you professionally?

LOOKING FORWARD

- What are your views (or plans) around integrating technology in the classroom going forward?
- What are your views (or plans) around learning through play going forward?

- What kind of a teacher will you be after the LGP project ends (2017)?

12.3 Individual responses

Teacher A: Looking back: Teacher A started teaching Grade R at the project school ten years prior to the start of the project. She had become a teacher because she enjoyed being with children and she had developed a love for teaching over time. There were only five staff members at school and she was the only Grade R teacher, one teacher teaching Grade 1, another Grades 2 and 3 combined, one teaching Grades 4 and 5 combined and the last Grades 6 and 7 combined. Each teacher worked mostly on their own and so she found it daunting when the time came to engage with teachers from other schools in the Learning Gains project. She had no experience of tablet technology and found it very difficult to start to make use of the tablet in the classroom especially without support at school.

Looking in: Teacher A was self-motivated by her love of the children and looked forward to each day in the classroom. She had 18 learners in her Grade R class and all of them lived in the local village where the school was situated. Teacher A felt that she could be herself with children, without judgement and with acceptance. The LGP project had had a positive influence on her but more from a personal perspective than a professional one. She had learnt technology skills when before she had no knowledge or experience of these. She had used these new skills in her classroom but had really valued them most in her personal life.

Looking out: Teacher A felt that the body of learners at her school was very stable. Some of the parents of learners kept contact with their child's teacher and some did not - but parents could be successfully contacted for discussions, if there were problems with a learner. Some parents were very supportive but Teacher A felt that the other teachers at the school were not supportive of each other. She felt that Grade R teachers in general were not valued by other teachers. Teacher A loved teaching Grade R, had no aspirations to teach higher grades, and was frustrated by the lack of acknowledgement of the importance of Grade R and her valuable work with these children.

In the light of this, Teacher A has enjoyed the project. The teachers of the older grades had been interested in the tablets particularly, and had wished that they could have been using them in their classrooms too. She has enjoyed being part of a pilot that the other teachers wanted to have been included in. She felt quite proprietorial about the tablets and the Xbox. Teacher A felt the Xbox had been just as useful for learning as the tablets. She felt the children enjoyed the Xbox more. She enjoyed the fact that it exercised the whole body in an unrestricted and entertaining way. The learners had not been proficient with using the tablets in the beginning and a lot of time had to be spent on developing their tablet skills. This meant that the tablet games were less accessible to them than the Xbox games. Teacher A had had

positive feedback from parents; they had been impressed by the integration of the technology at school. Even though Teacher A believed that the technology had given her extra teaching ideas and that the other teachers had been envious of her involvement in LGP, she did not feel that she had gained more credibility among her work colleagues.

Looking Forward: Teacher A believed that the LGP project was really worthwhile. She intended to continue using both the tablets and the Xbox with her learners. She felt that there was still lots to explore with the tablets and that the Xbox has really improved physical education outcomes. She was sharing the Xbox with the other grade teachers. Although the principal had overall control over the use of the technology, Teacher A wanted to have input in terms of advising the other teachers how to keep the technology safe and how to use it. She did not want to share the tablets with the other teachers. She had warned the teachers that the older children would vandalise the tablets and remove the memory cards. While Teacher A finished the LGP project with greater classroom skills and confidence within her class, she still felt a great lack of support and even disapproval from her work colleagues. Her own progress had been greater personally than professionally due to her less than satisfactory work environment.

Teacher B: Looking back: was a young teacher, who had only committed to teaching quite recently. She always loved people and especially children and so she knew that she wanted to work in an environment interacting with others rather than sitting in an office. After school she studied psychology completing her degree in three years before being employed as an intern. While not originally planning to be a teacher, as a result of her internships, she decided to study a PGCE. Teacher B started her teaching career at her current project school in late 2014 and only joined the LGP project in 2015. She was excited to be included in the project and enthusiastic to master the technology. Teacher B was a confirmed technophobe when she joined the project despite her young age. She did not have a tablet at home and she relied on her brother to help her with her phone. She had to learn from the beginning how to use her tablet herself before she could make the most of her new tablet in the classroom. Within months she became a shining example of an innovative teacher who is comfortable with technology integration.

Looking in: Teacher B described herself as versatile, enthusiastic, energetic, creative and hard-working. However she has felt that one needed a “thick skin” to survive as a teacher. Teacher B has been invested emotionally in all her teaching; she found it devastating when she had planned a great lesson and learners misbehaved. Her school was listed as a ‘full-service’ school. This meant that the school was intended for the provision of services for learners with challenges. The problem was that the building to house the special-needs facilities had been built but no staff had been appointed to provide these services. Therefore

special-needs learners in the community flocked to the school but the teachers were not qualified to meet their special requirements. These learners were now in mainstream classes therefore. Teacher B said that other teachers had told her not to focus on these children and just to teach the rest of the class at the expected pace but she believed that as much as 40% of her class were not coping at school. She found it very difficult to push on with those learners who could master the work when so many learners could not master it. School policy decisions to progress weak learners through the Foundation Phase grades because of their age rather than achievement, had added to the problem and caused her more frustration. The LGP project had provided some diversion for her because she had enjoyed the challenge of integrating the use of the tablets and Xbox in the classroom despite the difficulties with her learners. She described how the learners had been quick to learn how to use the technology and had soon overtaken the teachers. Teacher B's challenge was that as the learners' excitement increased, so too did their lack of control and bad behaviour.

Looking out: Teacher B enjoyed good relations with her colleagues and was happy working with the rest of the teaching staff. Unfortunately she didn't share that opinion of the learners or their parents. She believed the home and community environment was damaging the children whose behaviour at school could be described as intolerable. Children came from the township and beyond due to the full service expectations within the community. Without the specialised manpower promised (counsellor, psychologist, occupational and speech therapists etc.) the mainstream teachers were told to give special attention to the special-needs learners but with large and disruptive classes, this had been impossible. The majority of learners came from problematic homes and had already developed behavioural problems. In many cases the grandparents were raising the children. In these cases, the teachers never saw these parents themselves because they dealt only with the grandparent who invariably struggled to cope with the children. Teacher B was dismayed by the parental approach, they "just want me to beat the children" she said. There was no partnership between teaching staff and parents or even grandparents. Teacher B no longer tried calling these homes and had not had any feedback from parents or grandparents about the LGP project but she reported that the learners told her that they use their caregivers' tablets at home.

Looking Forward: Teachers at this school outside the project were envious of the tablets that the LGP teachers received. They had also wanted this opportunity but feared the added workload. Teacher B tried to train some of the other teachers in using the tablets but it was the probability of it bringing extra work that had discouraged them from persevering. The many demands on the teachers meant that they could never prioritise it. Due to the fact that so many learners were struggling academically and not meeting CAPS requirements, the LGP project had been viewed as a luxury. As Teacher B says technologies are "nice to have in an ideal world" but this project school was far from that ideal.

Teacher B had enjoyed the opportunities the technologies had afforded her – her improved skills boosted her confidence. She learnt to take charge among her colleagues despite her youth and they had appreciated her assistance, especially with issues around the required submissions. Teacher B felt she had learnt to work better with her colleagues through the opportunity provided by Learning Gains through Play project.

Teacher C: Looking Back: For Teacher C, teaching was a calling. She loved children and especially little children. She always had endless patience with them and enjoyed working with them. Teacher C had started her career by running her own crèche at her home. She then taught Grade R for five years before securing a bursary for further study. She then went to University and earned a National Diploma in Education for Foundation Phase. Like so many LGP Grade R teachers, Teacher C valued Grade R highly. 2017 was the first year that she had been teaching a Grade 1 class rather than a Grade R class. She appreciated that teaching was difficult work and that the children's needs were great. She felt that LGP had made her job easier. The education district was introducing English in Grade 1 the following year and she had a great hope that the tablets would play a major role in making this successful.

Looking in: Teacher C's strength was that she loved to be with children. She loved to do extra classes – it had never been a hardship for Teacher C to spend time with children. She wanted other teachers to appreciate what she could get out of her children. She particularly loved the slow learners as she felt as if she could really make a difference for them. Teacher C did not appreciate any criticism that didn't come with a solution. She had enjoyed working with the other Grade R teachers who had been appointed as the school had grown. Teacher C still saw herself as a mentor to these first three Grade R colleagues although, with her move to teach Grade 1, she had been now replaced in that role. Teacher C was not used to any kind of technology at the start of LGP. She had a simple phone for making calls only. Now she was using her tablet personally as well as in the classroom. She loved using WhatsApp. The LGP project had introduced her to technology in all aspects of her life.

Looking out: Learners at this project school were mostly living in the local township. It was not common for the parents to engage with the school. Most mothers were young and school-going themselves. Teacher C often engaged with the grandparents as they were the ones taking responsibility for raising their grandchildren. There were also many orphans. Those parents and grandparents that Teacher C did engage with, had been extremely excited by project and the integration of technology in the classroom for their young children. Teacher C felt that enrolment at the school has increased due to this. In the final year of the project there were more Grade R learners enrolled than ever before, making five classes for Grade 1. The children told their caregivers about what they did in class and Teacher C felt that the technology was changing the way the community viewed the school and the learning it was

providing. Teacher C felt that the caregivers were far more interested in their children's learning than before and that the children enjoyed coming to school more than before.

Many of Teacher C's colleagues wanted to have been involved in the project too. Initial interest had been around the tablets rather than the learning but now the staff could see that the tablets were improving teaching. Their eyes had been opened to see the need for them all to have tablets especially for teaching English. In the beginning the lack of apps in isiZulu translated into less interest by the other teachers but now that the school was about to change to English as LoLT so teachers were feeling a great need for language assistance through technology.

Teacher C felt that the project had given her more respect at school, especially among her work colleagues. Other teachers visited her at her classroom to ask her to show them how she was using her tablet. Teacher C felt it important to have a special knowledge that other teachers wanted to learn too. This had given her more confidence when collaborating with her fellow teachers. Now when they have been working together, she didn't keep quiet as she used to, she spoke up because she knew that she had important things to say and she could say them.

Looking forward: Teacher C was a technology convert and now looked forward to always using a tablet in her teaching. In her new timetable, she had allocated more time integrating technology in her lessons. The Grade 2 teachers were going to use the technology that year too. The change to English had been a big shake up in their language policy. The need to master English pronunciation had meant that the use of the tablets and the Xbox in the classroom had been prioritised. The focus on learning through play had also been embraced by the teachers and would be extended beyond Grades R and 1. Teacher C said that all of the Foundation Phase teachers were on board and were seeing the technology as assisting through the transition from isiZulu to English. Teachers were reportedly very excited; those who had not been part of the project couldn't wait to get started because they all viewed the tablets as a special teaching tool.

Teacher D: Looking back: Teacher D had never considered becoming a teacher when she was younger. She always felt passionate about wanting to help people but she never felt that she would achieve that as a teacher. Through hard work and gaining her qualifications incrementally, she came to teaching via the route of first working in the project school as a cleaner and loving the school environment and the children as she watched them growing in front of her. As from 2007, Teacher D had been entrusted with her own Grade R class which she really enjoyed and in 2010 she studied further through a private institute to achieve a Level 5 certificate in Foundation Phase teaching. As with many of the Grade R teachers in the project, she had no aspirations to teach higher grades and felt that her work was extremely

important even though she felt that it was not valued as much as that of teachers of higher grades.

Looking in: Teacher D was passionate about her learners. She wanted to save them from any bad childhood memories that could happen at this young age because she understood that these could affect them later. She felt that the LGP project had helped to release stress. She had enjoyed focusing on the tablet apps and Xbox games; she saw the digital games as something beautiful and had enjoyed a personal sense of accomplishment at completing many game activities. Personally she has felt that she had benefited a lot from the LGP project.

She had not been interested in technology at the start of the project. She didn't even have a fancy phone; she wasn't even interested in having one and she certainly had not thought that technology could play a role in the classroom. For two years before the LGP project began, she was teaching Grade RRR and then moved to Grade R in 2014 just as the LGP project was starting. At that time she did not feel competent to teach these older children because she was preparing them for Grade 1. This had been the result of complaints and criticisms from an older colleague about the quality of the learning the Grade R learners were bringing to Grade 1. Since the LGP project started there had been no more complaints.

Teacher D believed that now the Grade R learners were learning better and were better prepared for Grade 1. She felt more confident about sending her learners to the next grade. While the LGP project had enabled her confidence to grow, she felt challenged by the peer-mentoring component of the project because she had been selected as a peer coach. She felt that despite being confident in her teaching of children, she was not confident in her training of adults. She said she was "a teacher not a trainer". She had found the peer-mentoring responsibility a burden. Despite this, she felt that she was part of a good team of teachers at her project school. They had worked together well although as a group they had experienced difficulties in working with the Grade 1 teachers.

Looking out: Teacher D was teaching with two colleagues who taught the Grade RR and Grade RRR classes. The three preschool teachers work really well together and, while they do not feel as if the other primary school teachers recognise the importance of their work, they feel especially supported by the principal. He visits them often in their classrooms and keeps them encouraged.

These pre-school learners came from a variety of areas including townships and informal settlements as well as being from a range of home environments and cultures. Many different languages were spoken at the school, such as Sesotho, Shona from Zimbabwe and even West African languages which had provided challenges in the classroom. Many children were living in poverty and were reliant on the school's feeding scheme unlike some of the children who

supplement their school meals with lunch boxes filled with treats from home. Many children were neglected at home with young, single parents who were irresponsible and uncaring. Many children were being raised by grandparents. Teacher D was worried that the children were often “uncontrollable” and that they didn’t have respect for others. She felt this was directly because they lived in environments where children were not respected by adults. She said that “being poor did not mean that you could not have respect for others”. Teacher D felt that this was a big problem in the community, people not caring about each other and not caring about their behaviour. She was concerned that there was a high prevalence of children who came to school and introduced other innocent children to the damaging behaviours they had been exposed to in their homes.

Some parents did engage with teachers and some responded positively to requests to meet over problems with learners. The parents were very interested in the LGP project and very excited at the use of technology in the classroom. Some complained that their children demanded to use their parents’ phones and tablets but this was light-hearted because these parents were very supportive and proud of the technology their children enjoyed at school. In the pre-school, the technology was only being used by the Grade R learners. This was because there were only 10 tablets working at that time. There were 28 Grade R learners so these tablets were used with the work stations strategy or as rewards for good work or behaviour. Even though this was not ideal, Teacher D said that it was a motivator as younger learners were keen to get into Grade R to have the opportunity to use the technology too.

The LGP project had filled a gap for parents; in the past “extra” activities at an additional cost had been offered such as swimming. Parents now viewed the use of technology as a replacement physical activity and a valuable extra that was free. Teacher D felt that the parents had become more impressed with her due to the project because they had more respect for a teacher who had embraced new ideas. Teacher D also felt that the higher grades teachers had renewed respect for her work. She said that before the LGP project they had heard complaints that “the children don’t learn in Grade R, they only play”. She now felt vindicated because the focus of the project was on elevating the concept of learning through play.

Looking forward: Teacher D would continue to use technology in her Grade R class going forward. In fact she was planning to double the time allocated in her classroom schedule for using the tablets and Xbox. She continued to find new apps on her tablet to use in her classroom and shared these with all the learner tablets so that each learner could play these games on their own tablets. She was using her tablet in class to demonstrate new games and then allowing the learners explore and play on their own tablets. She wished that there were more tablets available to use with her learners and she needed more Xbox games. At that time she did not have the Kinectimals game or any dancing games for the Xbox (that was soon

rectified). Teacher D said that the biggest impact on her from the LGP project experience was the realisation that technology could play such a valuable role in learning in the classroom. She had been aware of what technology could enable in her personal life before the project even though she had not taken advantage of this. It had been an eye-opener for her to see the value that technology can add in the classroom and she vowed that she would always be integrating it in her classroom.

Teacher E Looking back: Teacher E started her career by enrolling in short courses focusing on Early Childhood Development (ECD) and dealing with child abuse. She did eventually attend a Teacher Education College to study further. In 2009 she applied for a Grade R teaching post at the project school. She made the shortlist of five applicants. From this list two successful appointments were made – one was Teacher E and the other became her close friend and present-day colleague. These two teachers are close friends both at school and out of school – they know and trust each other like sisters. Both are studying for their Diplomas in Further Education through North West University. They support each other with their studies as well as their work.

It was clear that Teacher E loved all children. She felt a calling to do the work she was doing. She worked with many different children with many different and special needs. She provided structure to their lives. Time management was very important to her; she liked to be in time and provided a strict schedule. She personally served porridge for her learners at 7h30 every morning. She felt appreciated and valued by her learners and their parents. All her learners had been present at school all year – she has almost no absenteeism. The Grade R graduation had been held on Saturday the 3rd December and she was so touched by the presents and thank-you letters she received.

Looking in: Teacher E's greatest strength was her deep love of children, being hard-working and she saw herself as an advocate for Grade R education. She was a guest speaker on the importance of Grade R at the recent graduation ceremony. She felt Grade R lays a firm foundation for the rest of school. It was like building a house and her part was the most important part. Teacher E felt that it was a challenge to hold her own with other teachers. Grade R teachers do not have the same job security and benefits as other teachers and most teachers have used it as a stepping stone to teaching the higher grades. Despite this, Teacher E and her colleague were committed to remain teaching Grade R once they have achieved their diplomas – to demonstrate how important they believe Grade R to be. The LGP project had enabled Teacher E to develop technology skills that had improved her personal as well as her professional life. She has found it easier to prepare the required assignments for her studies which she had previously written out in longhand.

Looking out: Teacher E was not living close to the school but was aware that parents living in the township of the school were facing poverty challenges, many struggling to even provide food for their children. Grade R learners were being provided with porridge in the morning as well as the mid-morning meal through the school's feeding scheme. Many parents were so young that the teachers liaised rather with grandparents. Teacher E had found most of these grandparents responsive, keeping in contact with the teachers and being appreciative of what the teachers were doing for their children.

The community had been supportive of the project, impressed with such young children using tablets in the classroom and excited that their learners were learning to use technology and learning with technology.

Teacher E had been boosted professionally by the project. Grades 1 to 3 teachers at her school move up with their classes. Therefore the current Grade 3 teachers would be moving the following year to teach Grade 1 and be expected to use the tablets and Xbox with their Grade 1 learners. Most of these Grade 3 colleagues were feeling nervous about this because their learners would already be proficient. Teacher E was looking forward to teaching her colleagues not only how to use the tablets but the potential educational uses of these technologies in the classroom. This situation made her feel important, that as a Grade R teacher, she would play a vital role in staff development for the higher grades.

Looking Forward: There was no question of not continuing with the use of tablets and the Xbox in the Grade R classroom in the future. As Teacher E said "this is how we do it now!" Teacher E had a personal challenge in that her tablet had been stolen. She had felt a great loss not having her tablet in the classroom, especially for illustrating her story-telling. She had always prioritised play in her classroom even before the project. She believed that all learning at Grade R level was through play. The novelty that the LGP project had provided was play with technology. She viewed the technology as a great motivator because learners love the technology and so now their play involved technology.

Teacher E felt that the LGP project had changed her a lot. She was no longer intimidated by technology. She said "I have bought the technology – it is one of my babies now". She felt bonded with her tablet which had not been how she felt it at the beginning of the project. Of course, this was bittersweet as it reinforced the loss she felt for not having her tablet any longer.

Teacher F Looking back: Teacher F taught for many years in the Eastern Cape before arriving in the Western Cape. She had started teaching high school and had been disturbed to find that learners could not write. She found the same situation in Senior Phase at a junior secondary school. This situation motivated her to teach at a primary school where she

focused on Grade 2, 3 and 4. She noticed that teachers were progressing learners for convenience (to pass on 'naughty' children) and so she decided to focus on 'problem' learners. Teacher F believed that like building a house, learning must be built on a strong foundation. She described herself as a teacher who loved challenges. In 2011 she was appointed as a contract teacher at her current school and in January 2013, she was appointed as a permanent staff member, teaching Grade 1 and as Head of Department responsible for both Grade R and Grade 1.

Looking in: Teacher F summed up her strengths as that her work "must be finished and it must be perfect". She believed that "when a child does wrong, they can still do right". She felt all learners could achieve. She often took on the problems of her learners and would be unhappy if she were unable to solve any of their challenges, e.g. epilepsy. She felt very deeply for these children. Personally she has benefited from the project in the growth of her technological skills. At the start of the project she was unable to use a tablet or a smartphone. Her skills were limited to typing and printing her work. She never knew about emails or Facebook. The LGP project motivated her to learn to master technology. It began with creating her email address and being able to communicate through email and even sharing her photos. Now she could not live without it. When her tablet's battery died, she was lost without it. When it was being repaired she wasn't sure she would survive. Teacher F has enjoyed the exposure to teachers from other schools through the LGP project. At her own project school, the teachers were all isiXhosa-speaking. She had valued meeting people from different cultures at the workshops and her confidence in interacting with others and especially speaking in English had grown tremendously.

Looking out: Teacher F described the community serviced by the school as being mixed with people moving in and out all of the time, people from Zimbabwe, Zambia, Malawi, Mpumalanga and the Eastern Cape, as well as local and from further away such as Khayelitsha. Many languages were spoken at the school including Afrikaans. Many parents were unemployed, many parents are very young with substance abuse and excessive drinking being common among them. Teacher F described most children as coming to school hungry, and that some children come to school "just for food". There were some children with supportive parents who came to school to meet with the teachers when called. However many parents were illiterate and unable to help their children with school work. Other parents were not supportive at all and would never come to school. One of the problems was that parents viewed the Foundation Phase education provided by the school as being dependable and of good quality but when the learners' English improved, the parents removed them and sent them to Intermediate Phase at English schools. Teacher F complained that parents would make such little children travel so far to school; she felt that they were better able to cope with this travel only when they were older. She acknowledged that the successful practises

of the Foundation Phase meant that their learner composition was stable and their learner attendance was high with no problem of absenteeism.

Other teachers at the school were very interested in the project and had wanted to be involved in it. The principal had been requested by the Western Cape Education Department (WCED) to give a report on the LGP project at a Foundation Phase Conference. Teacher F had accompanied her. Delegates had wanted to know more so Teacher F did a presentation at the school and many teachers attended and were very impressed. WCED's Cape Teaching & Leadership Institute had also asked Teacher F to talk about integrating technology in the classroom and subsequently the school had received a further 24 tablets with a computer. The training of the Deputy Principal and two new teachers (for Grade 6 and Grade 3) had taken place but they had asked Teacher F to assist further; she had been demonstrating on her own tablet how to download apps and how to plan using technology.

Looking in: Teacher F felt that the LGP project had raised her profile; she was well-known now. It had boosted her confidence, her passion and her reputation. The opportunity to travel to Durban to present at a conference had been a highlight and she had presented at an international conference in Cape Town. The project had exposed her to many diverse people and to different cultures.

Teacher F felt her teaching practice has been completely changed through the LGP project. There was no question for her that she would continue to integrate technology in her lessons and planned to expand its use. She wanted the Grade 4 learners of 2017 to use the new tablets and she would ensure that this was going to happen. She had undertaken to assist the Grade 4 teachers develop their technological skills. She said "it is the 21st century, we must go forward". She believed that learners love technology and even before they go to school, they are able to use phones, TV remotes etc. so "we must move forward for them, not back!" Teacher F had registered for an online course because she wanted to learn more in order to be able to do more. She wanted to grow so that she could help teachers beyond her own school. She believed that many "old" teachers had decided that change was not for them so she wanted to show them that if she can do it then they can too. She believed that it was critical for teachers to have their own personal tablets before they could use them in their classrooms for their work. She felt that schools must invest in teacher technology first. She described it as "you must have a car to learn to drive". She is disappointed in the teacher training around technology provided by WCED. She said that when she helped teachers she started with smart phones to get the teachers on board to see that the tablets are not very different to their phones. Teachers who didn't have smart phones had found the tablets more difficult to use. In planning, Teacher F believed that technology should always be present, even in assessment.

Looking forward: Teacher F believes that her views about the value of play at school had changed a lot through the LGP project. The use of the Xbox had introduced more play. The indoor games had solved the problem of not being able to do Physical Education outside due to flooding which was frequent. Even though the assembly of the Xbox could be time-consuming, the demand for it from the learners had been great. The school had been lucky enough to receive two Xboxes and it had made the sharing between the eight classes easier. The Xbox had even been used at school fundraisers, for the parents who eagerly paid to take turns playing Xbox games.

The LGP project has enabled Teacher F to develop new skills. She had considered a job swap with a school closer to her home but this idea had been met with horror at her school. Teacher F therefore felt valued and appreciated at her school and was committed to stay there beyond the project to continue the progress of integrating technology in the classroom. She had been disheartened at times when other teachers were not as enthusiastic as her but she believed that they were all growing and she managed frustrations by not focusing on the challenges but rather on the bigger vision. Teacher F's advice to teachers introducing technology in the classroom was to be committed through right to the end. There should be no half measures.

Teacher G Looking back: When Teacher G started at her current school, she taught Grade 3 for four years. Her passion had always been for working with early learners and therefore she moved to Grade 1 where she had been for the five years prior to the project. In her teaching career she had experienced teaching the full range of grades but her first choice was in Foundation Phase. Grade 1 was where she felt she could make the greatest impact. She loved the growth and change she could see in her learners particularly from June of their Grade 1 year to the end of that year. She said she sees them change from "babies to learners".

She had always loved to work with what she calls the "afvlerkies" (the children with broken wings, those who struggle not only academically but physically, socially and emotionally). Teacher G described what she did, not as work, but as a passion. She had had the opportunity to be a stay-at-home mother but had rejected this in favour of doing what she loves. Her days flew by; she loves being at school.

Looking in: Teacher G described herself as a very organised, well-structured, strict person who believed it was much more time-efficient to work alone. She was very happy to share her work with her colleagues and often worked late at school until she had finished what needed to be done. The LGP project has opened her eyes to the opportunities of what technology can do particularly for the weaker learners. She was tech-savvy at the start of the project but she has enjoyed helping the older teachers engage with their tablets and the

technology in the classroom. Teacher G believed that the project had been a positive experience for all – the learners and the teachers. She felt that the tablets had brought life into her classroom and she was still getting a thrill out of writing “tablets” and “Xbox” in her planning notes.

Looking out: Teacher G felt that she was still an outsider at her school even after nine years of teaching there. The rest of the staff were very close, most having been there many years and some having never taught at any other school. A number of the over 50-year-old staff members had even been learners at the school. The school suffered from lack of funding for maintenance. On the day of interviewing Teacher G, her husband was painting her desks in preparation for next academic year with cans of paint that she had bought out of her own money. The school accommodated a broad spectrum of learners many of whom travelled from far away via dangerous roads. When Teacher G started teaching at this project school it had been predominantly Afrikaans - speaking. There had been a shift to two English classes and only one Afrikaans class in each grade, resulting in an increase in isiXhosa-speaking children in the “English” classes. Teacher G was concerned that the reason most children were repeating grades was due to issues with English language. She felt that the tablets had really helped address this problem for these learners who were at risk.

The use of the tablets in the classroom as a result of the LGP project had increased enrolment at the school. Teacher G said that the school was known as “the school with the tablets”. On tablet-use days there was no absenteeism in those classes. Parents all knew about the use of the technology and were as excited as the learners. Many parents were buying cheap tablets for home use and downloading the games their children were using in the classroom. Teacher G has experienced very positive responses from parents to her explanation that their children are not just playing games but learning important skills.

Professionally the LGP project has caused Teacher G to grow. Using the technology from outside to meet the department requirements had given her a new mind-set. She felt liberated from textbooks and department resources and able to explore a whole new world for learning.

Looking forward: Teacher G said she would always use the tablets as a resource in her classroom. She would definitely use the Xbox in Life Skills too. The technology use in the classroom was a revelation for Teacher G. Even as a tech-savvy teacher, she had not envisaged extending her home use to the classroom before the project. The biggest change for her was taking the tech use she was familiar with at home into her classroom. Now Teacher G was even assessing using the technology. Teacher G is hoping that her school would look for funding to expand the use of technology to the higher grades. Teacher G felt the present technology should remain focused on Grade 1 because a games-based approach with play-for-learning was the most appropriate for Grade 1.

In terms of the LGP project, Teacher G felt that the project had begun with a bang. It was so exciting at the start (probably due to the arrival of personal tablets for each teacher involved). She had felt it was difficult to keep that flame of excitement burning in the second year and maybe an infusion of more inputs could have kept the momentum going. She also felt that the older teachers needed a dedicated room for tech-driven lessons and she was hopeful that the school was willing to have this in place in the near future.

Teacher H: Looking Back: Teacher H had a disabled sister who was seven years younger than her. This circumstance had formed Teacher H's whole being. Her sister was born healthy and experienced normal development until the age of nine months. She had changed after a measles vaccination, becoming unresponsive and suffering from fits. Her parents relied on her to help with her sister and so she had to become independent herself from a young age. Teacher H loved and admired her parents and she had understood that there could be little attention available for her while growing up. She had always been fiercely protective of her sister. At age nine, her sister was in hospital when due to another medical error, she started to come out of the coma spontaneously and without the usual seizures. She was discharged from the hospital on a new drug regime which was able to control her seizures. She was able to get up and move around and learnt to wash and dress herself. She was 23 years old at the time of writing and lived at home with Teacher H's parents. She would not talk to any adults but she would talk with Teacher H and she would give short instructions to her children whenever they visited. This family experience had had a profound effect on Teacher H. Teacher H would always stand up for handicapped children, those who struggle and those left behind. She was attracted to children who needed help and no matter what that need might be, she was committed to provide it. She appreciated the experience of teaching Grade 1 as she felt that she could make the greatest impact there. Teacher H completed her B.Ed. and was hoping to study Honours in Special Education one day.

Looking in: Teacher H was extremely organised; she planned everything thoroughly and anticipated outcomes and catered for all learner responses. She was very protective of all her learners and felt that this came from her protectiveness of her own sister especially from the insensitivity and even cruelty of some people. Teacher H had lots of empathy for her learners but she maintained a strict and consistent classroom environment. Teacher H was particularly precise and picky about language and she would make more work for herself than necessary in order to produce perfect work. In group work activities she always ensured that she was involved in the final production; she liked to have the "last touch".

Through the LGP project, Teacher H had learnt to incorporate more resources. She looked more broadly now for resources and had found greater teaching strength in so many more resources. Recently she had created a PowerPoint presentation of a story to teach the "-ie"

sound in Afrikaans. She rewrote the “Drie Varkies” story to highlight the phoneme and sourced 96 pictures to bombard the learners’ senses using the technology. Teacher H had good technology skills at the start of the project but she has made a shift to using these to optimise learning in her classroom. She has enjoyed using the video facilities to “authenticate unfamiliar words” and explain these to her learners. The arrival of the TV at school had revolutionised teaching for Teacher H. She could connect her Samsung cell phone remotely to the Samsung TV and she loved this novel use of the technology. She has played music, videos and connected to the internet on her phone while sharing with learners on the big TV screen. This had meant that she was using her tablet less than her phone. She thought it was because her tablet was old because it was also a Samsung product but she had tested the latest version of her tablet and been disappointed. Apparently the latest Samsung tablet used a downloaded app to connect with a Samsung TV and this method was not reliable. Teacher H was happy with the system she has working perfectly for her at the moment in her classroom.

Looking Out: Teacher H’s school catered for very poor children; it had a feeding scheme sustaining 400 of the 950 children at the school. Many children lived close to the school and many travelled a short distance from the informal settlements. Teacher H also lived nearby the school. She was already very comfortable using technology when the project started. She had a smartphone, tablet and an Xbox at home for her tech-savvy children. Therefore it was an easy shift for Teacher H to make to use her technology skills in her classroom.

This had not been the case with her colleagues. Teacher H, at age 30, was much younger than her colleagues, who were in their 50s. These older teachers had had to learn to use the technology from scratch. Teacher H had played a big role in helping them master their tablets, the learners’ tablets and the Xbox in their classrooms. The team teaching for teacher H was a pleasure as the Grade 1 teachers worked as a tightknit team with mutual respect.

Teacher H was looking forward to the following year at the school. There had been big changes in staff. Two teachers had left and two new Grade 1 teachers would be joining them. A new principal has shaken things up but Teacher H was excited about this. She liked the new principal and believed that she had a great vision for taking the school forward.

Looking forward: Teacher H had wholeheartedly embraced incorporating and using technology in her lessons. She believed that the project “authenticated learning”, it had opened up the children’s world and provided more varied exposure to life. The children through their parents had technology at home but had not been using it educationally. The LGP project has shown how to make technology educationally worthwhile for learners.

Teacher H would continue to use the Xbox for planned activities to meet specific outcomes. She felt that it was limited for “spur of the moment” use, due to the time and effort needed to set it up. She would also make ongoing use of the learner tablets in her lessons. She believed that her teacher tablet was really too old to serve its original functions as she has found that limited software updates were available for it. She had such an efficient system working with her smartphone and the classroom TV that this was her new chosen teacher tool. She incorporated this technology into every lesson.

The LGP project had opened her eyes to realise the value of playing in learning. Both she and her Grade 1 colleague were very strict and consistent in that strictness. They could both be regimented but they had both changed through the period of the LGP project to be less rigid - and more playful. Teacher H felt that they had both “loosened it all up a bit” to enable more important time for play. She said that they were “set in their routines but LGP freed them up to take a more playful approach”. This approach she felt was what had made the most impact.

12.4 Discussion

From the individual stories of these case-study teachers, it can be clearly seen that there is a passion and dedication that they bring to their work. All the teachers referred to their love of children and their fierce protection of them, particularly those learners with challenges.

A worrying concern was the extent of behavioural problems being encountered by these dedicated teachers which were preventing them from improving learning. There was a level of frustration caused by community circumstances beyond their control particularly having to deal with grandparents (because parents were still school-going themselves) or having no cooperation at all from families of disruptive learners.

All of the teachers valued the experiences they had had through the Learning Gains project and appreciated the opportunity that it had given them for improving teaching and learning. Even those teachers who were comfortable with technology before the project, admitted that they had not thought of using it for teaching and had not imagined the extent of the educational value that technology brought to their teaching.

One of the most valued impacts of the project that teachers articulated was the emphasis on play and the credibility that had been attributed to the value of play in learning. Many teachers had believed that play was valuable but had not felt sufficiently affirmed in this belief to use play extensively as part of their teaching strategies. The project had provided that confidence and given teachers the freedom to explore these teaching strategies further.

13.CHAPTER THIRTEEN – Results of the Supportive Environment

13.2 Summary

As already mentioned in Chapter Two, when designing the LGP project, it was certain that integrating technology in classroom practice especially at Foundation Phase level would change teachers' pedagogy just by the very nature of the tablets and Xbox. To mobilise a supportive environment for the teachers in their school, the Senior Management Teams completed a Change Management course of workshops. In the Western Cape, E-Learning District officials attended LGP workshops and visited schools to assist with technical difficulties as well as to advise on teaching with technology in the classroom. The LGP staff team also visited the schools, observed lessons and provided teachers with feedback as well as recommendations for appropriate apps and games.

As mentioned in Chapter Three, at the end of the project each teacher completed a questionnaire rating the support they had experienced from each of these different role players, choosing a score from 0 to 10 on the scale. The average of these scores provided some insight into the school environments in which the project ran.

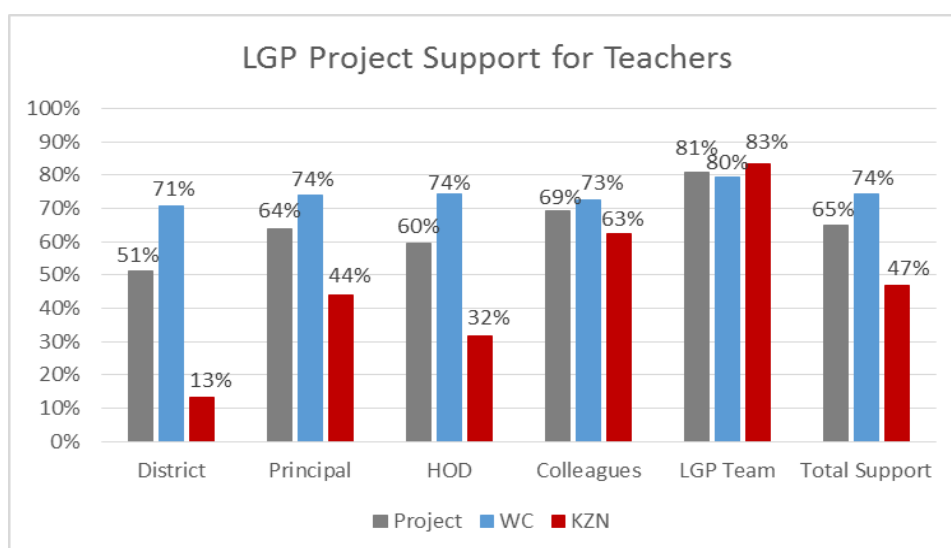


Figure 75: LGP Project Support for Teachers

When considering all of the project schools together (Project bar), it can be seen that overall all schools felt most supported by the LGP team (at an average rating of 81%). The lowest support was experienced from the District officials (at an average rating of 51%). Support within the schools ranged from 60% (HODs) to 69% (Colleagues).

When separating the data by province, a further pattern is visible. KZN teachers rated their support at only 47% overall compared with Western Cape teachers who rated their support at 74%. This difference is most extreme when looking at the support from District officials, where in the Western Cape, the involvement of District officials resulted in a rating of 71% while in KZN this was just 13%. Two of the five schools actually rated district support at 0%. For the LGP team support, this difference was minimal (2%), with KZN teachers actually rating the support they experienced marginally higher than Western Cape teachers. There are relatively small differences between the provinces when comparing the support from colleagues but KZN teachers experienced much less support from their SMTs than in the Western Cape despite all SMTs receiving the same inputs. The similarity in ratings for District officials, Principals (and Deputies), HODs and Colleagues in Western Cape schools suggests more stable and supportive management of schools in this province compared to the situation in KZN.

When considering the teachers' ratings of support at individual schools, the distinction between Western Cape schools (code B schools) and KZN schools (code A schools) is apparent. The exception is School A4 which is an independent school and possibly less restricted and less influenced by education department structures. This school's results were directly comparable with the Western Cape schools and noticeably different from the other KZN schools.

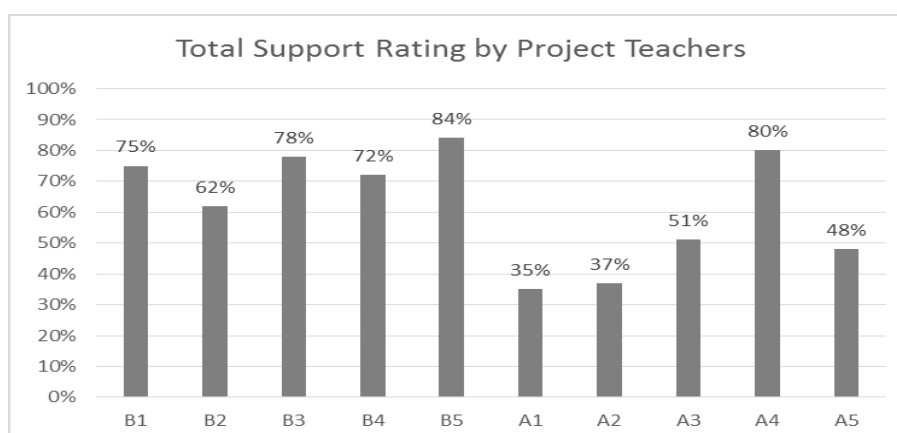


Figure 76: Total Support Rating by Project Teachers per School

There was one school which stood out among the others as making large learning gains over the course of the LGP project. That school was B3. It was interesting to see that while their average rating of support was high, as 78%, it was not the highest among the schools. It is interesting to look at this school in more detail.

13.3 Comparing Schools

When the LGP project began in 2014, the Annual National Assessments (ANAs) were still being written in South African schools. Grade 1 learners in all LGP project schools and the control schools wrote ANAs for Language and Mathematics. These results provided a standardized comparison between all of the schools involved in the project. When ranked according to their 2014 Grade 1 ANA results the rank table was as follows.

Table 10. LGP Schools Ranked on ANA Achievements (Grade 1 2014)

| Rank on ANA Achievements | School |
|---------------------------------|---------------|
| 1st | A3 |
| 2nd | B5 |
| 3rd | B4 |
| 4th | A5 |
| 5th | Control A |
| 6th | Control B |
| 7th | B2 |
| 8th | B1 |
| 9th | B3 |
| 10th | A4 |
| 11th | A2 |
| 12th | A1 |

When combining the achievement of all the learners assessed at each school on the LGP foundational literacy tests, another rank order could be established to make a general school comparison with this.

Table 11. LGP Schools Ranked on Actual LGP Achievements

| Rank of LGP Actual Achievements | School |
|--|---------------|
| 1st | B3 |
| 2nd | A4 |
| 3rd | Control B |
| 4th | A3 |
| 5th | B5 |
| 6th | B4 |
| 7th | A2 |
| 8th | B1 |
| 9th | Control A |
| 10th | A5 |
| 11th | B2 |
| 12th | A1 |

School B3 was ranked 9th among these 12 schools near the start of the LGP project and ranked 1st at the end. School A4 also rose dramatically from 10th to 2nd but there is another explanation for this. School A4 produced ANA results that were lower than expected as the Home Language ANA written at this school was in English which, while it was the language of learning and teaching at the school, was not the mother tongue of the learners. In all of the other schools, the Home Language ANA was written in the mother tongue language.

The comparison above was with the actual average marks achieved by each school. An alternative comparison was to use the ranking of schools according to the “learning gains” made through LGP. In order to measure “learning gains”, grade progression improvements (a percentage increase) measured in the control schools was subtracted from the results of the projects schools. This was because the control school grade progression improvement represents the “normal” learning gain expected without the project inputs. Any additional improvement above and beyond this could be seen as “learning gains” achieved due to the LGP project inputs. These calculated learning gains were added up for each project school to establish a rank order of schools from the smallest learning gains to the largest (ranked 1).

Table 12. LGP Schools Ranked on LGP Learning Gains

| Rank of LGP Learning Gains | School |
|-----------------------------------|---------------|
| 1st | B3 |
| 2nd | B5 |
| 3rd | A3 |
| 4th | A1 |
| 5th | A5 |
| 6th | B2 |
| 7th | A2 |
| 8th | B1 |
| 9th | B4 |
| 10th | A4 |
| 11th | Control A |
| 11th | Control B |

This method of calculating “learning gains” depended on zero learning gains recorded for the control schools as the “added value” or learning gain is the additional measure beyond this. Thus both control schools occupied the lowest ranking (of 11th as this was the same for both). Again School B3 ranked at the top of the rank table. Despite poor actual results School A1 made large learning gains and to a lesser extent School A5.

The LGP team were interested to find out more about the success story that was School B3.

13.4 Case Study of a Successful School

Interviews were conducted at School B3 with the Principal, Deputy Principal, Foundation Phase HOD/Grade 1 teacher and a Grade R teacher at the end of the project. School B3 is a big school – almost 1300 learners and 36 teachers. The Principal, Ms M., wanted technology in all classrooms. In Foundation Phase (except Grade R) the teachers moved up with their classes. This plan excluded the Grade 1 teachers for the duration of the LGP project as Ms M. did not want to disrupt the LGP workshop plan and teacher inputs. As the LGP project ended, Ms M. devised a plan to use the LGP teachers to teach the new Grade 1 teachers how to use the technology in their lessons. Ms M. was concerned that these teachers did not have their own personal tablets as the LGP teachers had but she was committed to finding the means to provide more tablets in the school both for teachers and for learners to use in the classroom. Due to the dedication observed in this school, the project was able to donate a further bank of tablets to this school during year 3 of the project.

Ms M. was involved in the LGP project right from the start. When the project was first initiated, she consulted with the teachers to prime them and to reassure them of her support. She approached the School Governing Board (SGB) to secure their buy-in and support. They agreed to fund the cost of transporting the teachers to the professional development workshops over the years ahead.

Ms M. knew the learners would be very receptive to technology in the classroom and was concerned that the learners' technology skills would be more advanced than those of the teachers. To counteract this, she asked for volunteers to mentor the teachers and built support for them. She encouraged them all to work as a team. Ms M. herself was an active member of the team working together with the teachers on the assignments and so monitoring attendance at the workshops too. When they faced challenges such as a few teachers who were resistant to the change and didn't want to be monitored, Ms M. was able to win them over successfully by applauding them and encouraging them on their journey of change.

All teachers in the school were made aware of the gains in the LGP project; the feedback from workshops was shared so that other phase teachers could also support the LGP project. Ms M. visited the Grade R and Grade 1 classrooms regularly to observe the technology being used in the classroom and she made the most of these opportunities to applaud the learners too.

Ms M.'s Deputy Principal, Mr G. believed that success in any school starts with the principal. He was full of praise for Ms M. and after working under her at his former school, he had followed her to work at School B3 as her Deputy after she had been appointed as Principal. Mr G. saw his role in LGP similarly to his deputy principal role in that he was Ms M.'s background worker. He fielded the problems before she was faced with them. He managed

the maintenance and security of the tablets. Mr G. identified the “tech-illiteracy” of some of the teachers as the biggest challenge of the LGP project. He said that for many teachers using a calculator was high-tech. The Foundation Phase Head of Department, Ms. B actively helped the stragglers to keep up. The management of LGP was highly controlled and efficient. Mr G. believed that peer pressure among the teachers encouraged them to keep up with using the technology and he believed that they would all continue to use it going forward. Mr G. attributed the success of the LGP project at his school to the regular school and classroom visits by LGP staff and officials. Including the SMT in the project was another strength of the project. However the most important success factor for him was the analysis of results, the measuring and sharing with the teachers. Their teachers were proud of their achievements and wanted to achieve more. Mr G. also credited the support from WCED officials which had even extended beyond working hours. School B3 was made up of many teachers who shared admiring and supportive relationships, not only at work but in their personal lives too. The Principal, Deputy and HOD shared car lifts home after afternoon workshops. The two Grade R teachers were appointed together eight years earlier and were good friends assisting each other in furthering their studies through UNISA together. There was an optimistic, energetic and purposeful air around this prefab school contrasting sharply with the hopelessness of the sprawling impoverished informal settlement right next door.

13.5 Discussion

Teachers agreed that a supportive environment to change teaching and learning was necessary. In some cases this environment was created successfully and in others, not so successfully. According to the teachers this was not necessarily the deciding factor for successful learning gains. In some schools, the LGP witnessed teachers welcoming the change initially but being undermined and worn down by the negativity of others. The teachers’ poor ratings of the support they experienced from their colleagues, HODs and Principals documents this in these schools. Looking at the achiever schools what seems important was for teachers to meet opportunities for change with enthusiasm and then this contagious energy among a critical number of staff with existing positive relationships builds a supportive team to achieve success.

Due to the extraordinary attainments recorded by the project at the school that had become the highest achieving after starting as the lowest, additional interviews were conducted with Senior Management Team members, the Principal and Deputy as well as two teachers, for an additional case study, in order to fully understand this success story. This school had been seen as living evidence of the phrase, “levelling the playing fields” because it started at the lowest levels of learner performance and yet at the end of the project it was the highest. In the case of this school it developed what the project had hoped to achieve, “a supported environment”. This environment was in existence to some extent when the

project had started although with the advent of the project the school community had a rallying point. This school took more advantage of the professional development and the technology than the other schools in order to pull ahead of all of them. It was almost as if the positive relationships provided more than just a supported environment but rather an environment that inspired confidence, enthusiasm and a motivation for all teachers to make the most of the opportunity. Instead of the project being confined to two grades, at this large school it was shared with all grades and with considerable and deliberate senior management input. This remarkable progress could not have been achieved by the staff at this school without their open-minded and early-adopter attitude towards the integration of learning technologies across the curriculum.

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15. APPENDICES

Appendix A: Instruments and Surveys

SchoolNet Learning Gains through Play Evaluation Tools

LEARNER EVALUATION

Gross-motor Skills

Foundation Phase Physical Proficiency Assessment and Guideline
Grade R Physical Proficiency Test for Gross-motor Skills
Grade 1 Physical Proficiency Test for Gross-motor Skills
Grade 2 Physical Proficiency Test for Gross-motor Skills

Fine-motor Skills

Grade R Fine-motor Skills Assessment Tool
Grade R Fine-motor Skills Scoring Rubric
Grade 1 Fine-motor Skills Assessment Tool
Grade 1 Fine-motor Skills Scoring Rubric
Grade 2 Fine-motor Skills Assessment Tool
Grade 2 Fine-motor Skills Scoring Rubric

Numeracy Skills

Grade R Numeracy Skills Assessment Tool
Grade R Numeracy Skills Scoring Rubric
Grade 1 Numeracy Skills Assessment Tool
Grade 1 Numeracy Skills Scoring Rubric
Grade 2 Numeracy Skills Assessment Tool
Grade 2 Numeracy Skills Scoring Rubric

Visual Literacy Skills

Grade R Visual Literacy Skills Assessment Tool
Grade R Visual Literacy Skills Scoring Rubric
Grade 1 Visual Literacy Skills Assessment Tool
Grade 1 Visual Literacy Skills Scoring Rubric
Grade 2 Visual Literacy Skills Assessment Tool
Grade 2 Visual Literacy Skills Scoring Rubric

Oral English Skills

Foundation Phase Acquisition of Oral English Skills Assessment

Technology Skills

Experiencing Technology Learner Questionnaire

TEACHER EVALUATION

LGP Retrospective Teaching Questionnaire

LGP Teacher Input Questionnaire

LGP Teacher Support Questionnaire

LGP Teacher Tablet Use Questionnaire

LGP Teacher Xbox Use Questionnaire

Experiencing Technology Teacher Questionnaire

LGP Teaching Practice Questionnaire *

Enhanced Classroom Observation Checklist**

LGP Classroom Language Analysis**

* Not used (replaced with the LGP Retrospective Questionnaire

** Used formatively only

Appendix B: Project Videos

| Date | Topic | Link |
|------------|--|---|
| 1/10/2016 | Conference presentation Xbox Ms Mpumelelo Hadebe | https://youtu.be/MGQcMY158fl |
| 1/10/2016 | Conference presentation Xbox Ms Lizeka Melapi | https://youtu.be/eo5gXPzBlc4 |
| 1/10/2016 | Conference presentation Tablets Ms Joyce Ntuli | https://youtu.be/_r5yjsfAAEk |
| July 2016 | Qualities of Peer coaches Ms Mpumelelo Hadebe | https://youtu.be/o-7vLqXINCM |
| July 2016 | Why Peer Coaching Ms Jabu Mkhize | https://youtu.be/cYnaH6LRzWE |
| 27/05/2016 | Principals' lessons learnt Ms Nompumelelo Buthelezi | https://youtu.be/S_hLAifCOG4 |
| 27/05/2016 | Principals' reflections on the project Mr Damon Shaw | https://youtu.be/qwbE_XVI4fw |
| 22/06/2016 | Xbox Lesson Grade R Ms Lizeka Melapi | https://youtu.be/qwbE_XVI4fw |
| 21/06/2016 | Special needs and technology by Ms Bianca Beyer at Graduation WCape | https://youtu.be/phzfRv3Bzkl |
| 22/06/2016 | Xbox lesson Grade R Ms Nonhlanhla Khambule | https://youtu.be/sOkwbrvqF9s |
| 21/06/2016 | Graduation speech on Grade R Ms Lizeka Melapi | https://youtu.be/DpV1Mjj--x0 |
| 19/05/2015 | Maths lesson observation Grade 1 Western Cape | https://youtu.be/dfiTZor8ogo |
| 18/05/2015 | Xbox Grade R lesson Christmas Tinto | https://youtu.be/IX-sPFz4ox8 |
| 4/12/2014 | Workshop presentation Ms Ntombifikile Ndabeni | https://youtu.be/d5tJ4ZX_bbE |
| 4/12/2014 | Workshop presentation Letitia Qayi | https://youtu.be/XXM7wfiqKjk |
| 4/12/2014 | Workshop presentation on Xbox Somerset West Primary | https://youtu.be/n7zRxcEDmnw |
| 4/12/2014 | Workshop presentation on Xbox Mr Sipho Didiza | https://youtu.be/1hcFBw-u4IY |
| 4/12/2014 | Workshop presentation on Xbox Ms Thembeke Tafeni | https://youtu.be/a3cGABEROAc |
| 22/06/2016 | Xbox lesson Grade R Ms Nonhlanhla Khambule | https://youtu.be/rtMpvGYNuW |
| 21/06/2016 | Graduation presentation Ella Klaasen | https://youtu.be/MMa43HzGJBc |
| 06/06/2016 | Graduation Presentation – tablets and deworming Ellham and Glenda | https://youtu.be/66q2Cx4Btfo |
| 06/06/2016 | Address from DGMT to Western Cape Graduation by H Mfeka | https://youtu.be/DTI_8bX2zL0 |
| 16/06/2016 | Graduation speech on prproject impact by Ms Joyce Ntuli | https://youtu.be/feU2RgnzQq0 |
| 16/06/2016 | Graduation speech on project Ms Sindisiwe Mwelase | https://youtu.be/0SpmvxfOEjM |
| 16/06/2016 | Graduation speech on the impact of the project Mr Damon Shaw | https://youtu.be/ssbMuRLB6KM |

| | | |
|------------|---|---|
| 16/06/2016 | Graduation KZN Ms H Mfeka introducing Principals | https://youtu.be/5oXCuDL43Gk |
| 16/06/2016 | Graduation speech by principal Buthelezi on Change Leadership | https://youtu.be/TuEVtCcgbBc |
| 16/06/2016 | Ms Nomumelelo Hadebe on Xbox assessment of learners | https://youtu.be/eN2WbVF6M3o |
| 16/06/2016 | Graduation speech on Grade 1 impact Ms Thembisile Maphumulo | https://youtu.be/Hz2VfkToAfE |
| 16/06/2016 | Teachers appreciative songs for the Learning Gains project team | https://youtu.be/_BSeKJL1GZ8 |
| 16/06/2016 | Graduation presentation by Ms Nompumelelo Hadebe on Xbox | https://youtu.be/Nm9U8v_eyh0 |
| 13/06/2016 | Graduation presentation Grade 1 Ms Fikile Ndabeni | https://youtu.be/Qqr1FbYinaE |
| 06/06/2016 | Graduation Presentation Gd 1 Ms Noxolo Buyeye birthday calendar | https://youtu.be/wm1KlGvIWdk |
| 09/04/2016 | Workshop discussion Ms Mary-Anne Meyer | https://youtu.be/QvKnm_ZBp2U |
| 9/04/2016 | Workshop interview Zandile Khafula | https://youtu.be/IS-DfEowWQk |
| 9/04/2016 | Workshop discussion Ellhaam Isaacs | https://youtu.be/Vow6j5gKT60 |
| 9/04/2016 | Teaching strategy workshop discussion Ms Bianca Beyer | https://youtu.be/zq64-xCEiho |
| 09/04/2016 | Workshop discussion Ntombifikile Ndabeni | https://youtu.be/hBmeyuxY4Zg |
| 15/05/2015 | Grade 1 Cup cakes app | https://youtu.be/CSVSYqVO_qcg |
| 24/02/2016 | Grade R Xbox | https://youtu.be/60a2hEGWP9w |
| 23/02/2016 | Grade R Xbox dance lesson KZN Teacher Motau | https://youtu.be/p6qSoJxX6bo |
| 18/05/2015 | Grade R Xbox games | https://youtu.be/IX-sPFz4ox8 |
| 2015 | Videos demonstrating the stages of language acquisition | https://youtu.be/b41GrenQRm4 |
| 24/02/2015 | A lesson on healthy bodies using teacher tablet as a teaching aid | https://youtu.be/_QL_PNf9fAg |
| 24/02/2015 | River rafting at Temperance Town | https://youtu.be/60a2hEGWP9w |
| 23/02/2015 | G 1 Using tablet as a writing tool tracing letters | https://youtu.be/tKO5WhnpNbc |
| 01/09/2015 | Gr R select Xbox game even though they cannot read yet | https://youtu.be/k3x6rW3pWJc |
| 23/02/2015 | Writing names on teacher tablet before using their own Ms Waries | https://youtu.be/QP5xSv_OEAQ |
| 20/08/2015 | Demo lesson at Temperance Town Ella Klaasen Gr 1 using tablets | https://youtu.be/Csz_qOcEIDM |
| 11/09/2015 | Gr R Xbox dance with Ms Melapi at Nomsa Mapongwana Primary | https://youtu.be/iC_rqHjYU5o |
| 11/-9/2015 | Ms Shelembe explaining learner-driven app selection | https://youtu.be/LV2z2RGlyZ0 |
| 09/09/2015 | Gr 1 tablet lesson using learning stations strategy Ms N Hlela | https://youtu.be/8h_SAV9saXk |
| 31/07/2015 | Conference presentation on Xbox Kinectimals' emotional impact | https://youtu.be/ZrmX1lvLLPg |

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| 31/07/2015 | Conference presentation on value of Xbox games for special needs | https://youtu.be/dcQ87i8QRdM |
| 16/001/2015 | Teacher workshop practising emotional literacy app | https://youtu.be/JiJioQNuu5o |
| 20/05/2015 | Vuyo, Gr 1 learner with special needs using the writing app | https://youtu.be/iC-YNOWSfBg |
| 19/05/2015 | Learners using digital calculator to check their Maths answers | https://youtu.be/T6hz9FuznD0 |
| 19/05/2015 | Learners with tablets more engaged with maths than those without | https://youtu.be/dfiTZor8ogo |
| 20/05/2015 | Gr R at Christmas Tinto primary engaged in Kinect games | https://youtu.be/lX-sPFz4ox8 |
| 20/11/2014 | Extremely short video of a learner squealing in delight at her cupcake | https://youtu.be/EfY69Vupnmw |
| 17/01/2015 | Teacher workshop practising fine motor skills app | https://youtu.be/YbNs-9mSMbY |
| 7/11/2014 | Gr 1 Xbox rally game – teacher identifies maths teaching moments | https://youtu.be/IRPOH61ru-M |
| 30/10/2014 | First practice for Gr 1 learners at Temperance Town with Xbox Kinect | https://youtu.be/0moq_dJjy7s |
| 07/11/2014 | Gr R first Xbox lesson for Somerset West primary learners | https://youtu.be/67ws04db8Pw |
| 10/10/2014 | Demonstration at teacher workshop on how to use the Memoirs app for recording progress | https://youtu.be/iEtf1r8gyHM |
| 30/08/2014 | SMT workshop problem solving using Role Play in KZN | https://youtu.be/fH65r89yp8g |
| 02/08/2014 | SMT workshop problem solving using Role Play in Western Cape | https://youtu.be/_2cHqVaQ0p8 |