

Conceptualising Learning Gains through Play

Introduction

SchoolNet South Africa is a non-profit organisation whose goal for the past 17 years has been to create 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 purpose of sharing this learning brief is to describe the difficult process of arriving at a credible Theory of Change for the project, Learning Gains through Play in the Primary. The brief starts with a summary of two projects previously undertaken by SchoolNet which provided the inspiration for selecting the teacher professional development approaches as well as the technologies for this project. There is then an outline of the thinking that contributed towards the conceptualisation of the project followed by the planning of the evaluation. The flaws in this planning are described as well as the journey undertaken to address them.

The inspiration

In 2011 SchoolNet installed six 55" television screens above the traditional chalkboards in six Foundation Phase classrooms at Lakeside Park Primary in the Vryheid district of KwaZulu-Natal. These television screens were connected to the Xbox 360 Kinect gaming console. Teachers spent their holidays becoming familiar with Kinect technology, being exposed to language-sensitive pedagogy and devising engaging learning experiences that would motivate learners through their own enthusiasm and involvement.

The findings from the Lakeside project, which was evaluated by Mindset, did not conclusively attribute learning gains to the Xbox but the gains were considerable. The evaluators used a mixed method approach combining quantitative as well as qualitative instruments. One might have anticipated an impact on oral use of English and the expected physical literacies when considering the nature of the Kinect games. Surprisingly, despite very little reading involved in the playing of most of the Kinect games, the evaluators found that the reading age of all learners improved during the course of the year.¹ Furthermore, the study found that it was not only the language and literacy skills of learners that improved but also numeracy levels, as well as their understanding of general knowledge.

¹ Mindset Learn and Verbeeks Education Specialists cc *Impact Evaluation Report* November 2011

The Head of Foundation Phase at Lakeside reported that “... *this learning increases their intrinsic and cognitive understanding of aspects of the curriculum. The use of this gaming technology has aroused their interest and it has energised the classroom atmosphere.*”²

The next initiative that was to influence 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 aspect 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.

The successes achieved by the CSIR team in Cofimvaba can be attributed to a combination of factors not least of which is their commitment and perseverance, but also the practical nature of the teacher professional development programme and a badge-based incentive programme. These factors have conspired to instil confidence and competence into teachers and officials, including the most technophobic of elderly teachers in the Cofimvaba district.³ Badging and gamification of classrooms has been developing world wide over the past three years and involves students gaining recognition for achievements through the allocation of badges according to prescribed criteria. In order to “earn” badges, the teachers in ICT4RED initiative have to prove they had have met the criteria by showing evidence such as a video, digital mind-maps of topics, photos of learners illustrating teaching strategies being used, sent email and photos of learners’ work.

Forming the concept

With just the 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.

Whichever activities were to be used to explore these questions, they would have to closely align with the national curriculum, which for the Foundation Phase consists of Language, Mathematics and Life Skills. Ten schools were selected from two provinces, KwaZulu-Natal and the Western Cape, as well as a control school in each province. The language of learning and teaching (LoLT) varies between schools and comprises isiZulu, isiXhosa and Afrikaans. Only one project school uses English as the LoLT but the home language of learners in that school is isiZulu. All learners in the country are expected to acquire English before the transition to Intermediate Phase where Home Language and First Additional Language are almost equally weighted. With the Lakeside experience in mind, team

² Ibid p.6 and p.55

³ <http://ict4red.blogspot.com/p/about.html> and <http://slidesha.re/1sC7JcC>

members felt that the focus on oral literacy should be on the acquisition of English and specifically on subconscious acquisition while engaging in play, as had happened at Lakeside Primary in Vryheid.

The national curriculum requirements of the Life Skills component include a strong emphasis on perceptual skills and gross and fine motor coordination. Play is stipulated 82 times across the Life Skills CAPS; examples are even provided in the Life Skills CAPS for 'free play' activities.

If the focal point of the study was to be the learnings gained through play then it followed that the effective use of games for both the Xbox Kinect and the android tablets would be fundamental to the exploration of the concepts of learner-driven and play-based learning.

The work of James Gee has influenced the conceptualisation of Learning Gains through Play. He is a psycholinguistics researcher who has specialised in acquired literacy but his current area of expertise is gaming and particularly how the principles of gaming can be applied to education⁴.

Designing the activities

From experiences in the two preceding projects, the Learning Gains through Play team felt strongly that not only would the teachers benefit from a curriculum of professional development featuring play but that the Senior Management Teams should undergo a course in Change Leadership to prepare them for the introduction of the technologies to their schools.

The CSIR team gave permission to use their teacher professional development course materials. These consist of modules that each promote practical teaching strategies such as role-play for problem-solving and the jigsaw method for research. The games-based learning module was expanded in order to ensure that teachers were able to design lessons for the effective use of the Xbox and to competently evaluate the suitability of available games. The teacher professional development approach encourages teachers to create environments where learners discover and explore concepts and skills. It also promotes an approach that recognises the need for cognitive development, through encouraging thinking, problem-solving, fantasy and creativity and develops ways for learners to be active - physically, cognitively and emotionally - by creating activities that are fun, challenging and relevant to their lives in the real world outside of the classroom.

The Change Leadership course models the same pedagogies as advocated in the teacher professional development course but addresses issues such as distributed decision-making and shared vision. Authentic case-scenarios are provided which tackle practical problems that consistently arise in technology in schools interventions. These case-studies, in turn, model collaborative problem-solving strategies including peer-coaching. Throughout the project, principals are encouraged to reflect on, monitor, evaluate and communicate about what is happening in their schools.

Developing the instruments

In order to assess the Foundation Phase literacies of visual perception, oral communication, fine-motor and gross-motor coordination as well as numeracy and emotional literacies, baseline data was collected at the twelve schools. Instruments were used for visual recognition, visual discrimination and visual interpretation. English oral communication skills were tested with speaking and listening

⁴ James Paul Gee, *What Video Games Have to Teach Us About Learning and Literacy* 2007 Macmillan

instruments. The physical education instrument used was calibrated with international tests for this age group.

A review of literature over the past two decades reveals a “theory that motor and cognitive systems develop dynamically by interacting with each other”⁵ Over forty-four studies indicate the importance of motor skills in the design of early school programmes and that early motor skills development results in the later advancement of perceptual skills as well as success in reading (correlated with locomotor skills), an increase in academic achievement particularly in Maths (correlated with object-control skills) and improved verbal skills. While the Xbox and tablets extensively use both fine and gross-motor skills, tablets also introduce new fine-motor skills such as pinching, stretching, dragging and pin-pointing.

Prior attitudes and exposure to technology was tested among teachers. Senior Management Teams and learners also completed surveys on their technology usage and exposure. Instruments were designed and administered for other valuable data on school management styles, existing teaching practice behaviour and present learning environments.

Theory of Change

The project plan made sense, the planned activities appeared to neatly target our objectives but the evaluation design and methodology had some serious gaps. While knowing that the findings of sound qualitative investigations need to be supported by credible data, we felt we had developed excellent instruments in order to achieve exactly that. However with the assistance of an independent researcher and Theory of Change expert, we were made aware that we had not made the crucial causal links between play, using technology and the development of our targeted range of literacies, which was preventing us from being able to isolate attribution.

The solution came via a Theory of Change workshop facilitated by the independent researcher, which compelled the project team to reconsider its approach in order to make those vital causal links. 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 us to clearly articulate:

- the problem we were addressing
- our long-term goal
- our pathway to achieving that long-term goal
- how we would determine success (our indicators and when and how we would measure)
- what we would actually do and what resources we required to achieve early and intermediate outcomes (activities, interventions, resources)
- the relationships between the problem and causes (the assumptions underpinning the pathway of change)

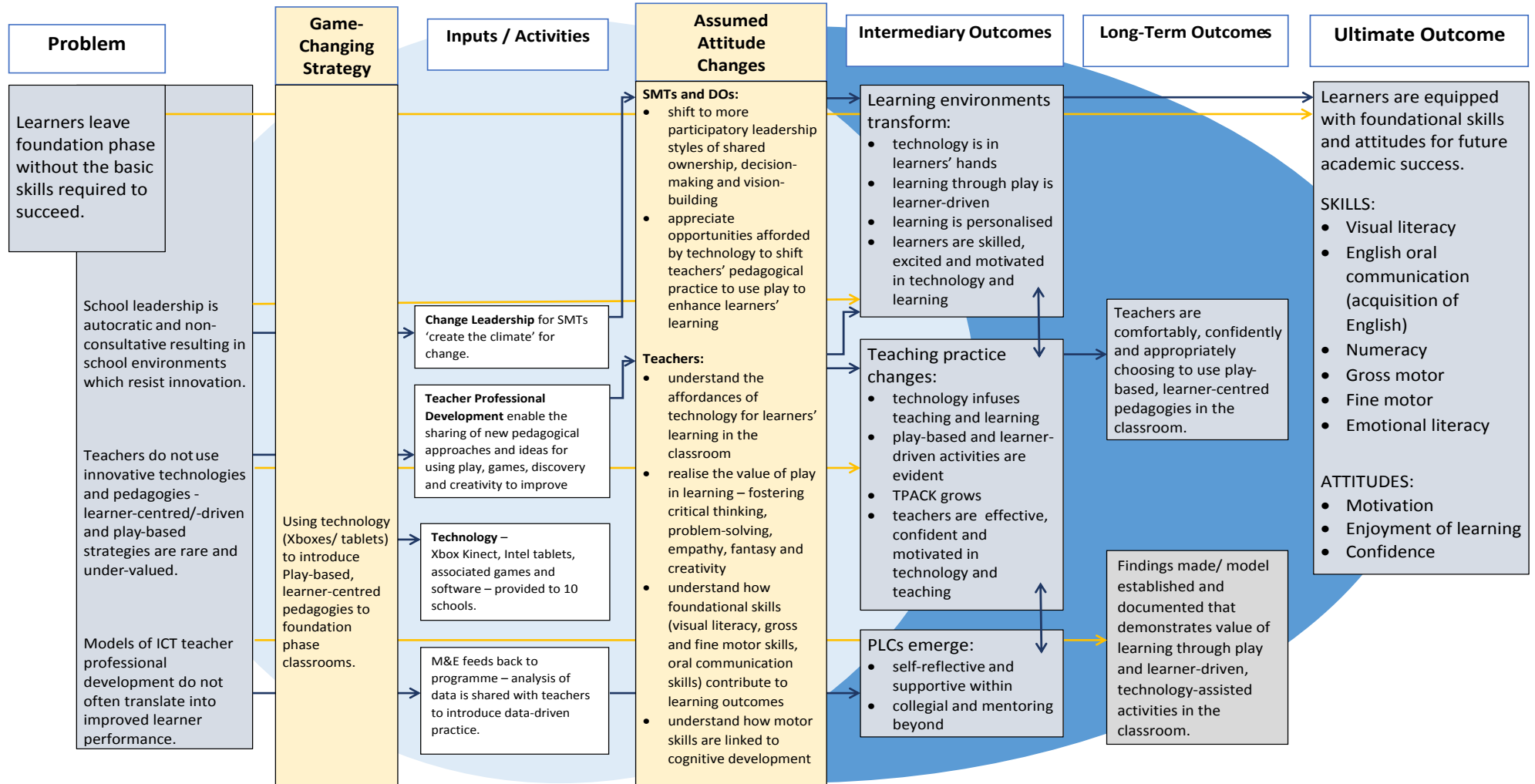
⁵ Samuel J. Meisels,, Seung-Hee Son, *The Relationship of Young Children’s Motor Skills to Later Reading and Math Achievement*, MERRILL-PALMER QUARTERLY, VOL. 52, No. 4

After a number of iterations, with possibly more to come, the following Theory of Change and associated methods of evaluation are outlined in the graphic below which includes the causal links represented by arrows. The conceptualisation of the evaluation of this project has proved to be challenging but with the help and encouragement from the DGMT, as well as a knowledgeable expert in the Theory of Change, it has been possible to achieve. The intention is to share all findings with the teachers throughout the life of the project and to support them in the process of data-driven planning.

This learning brief has tried to sketch the stages in an evaluation process that ought to have been undertaken much earlier in the project. However it is clear that having to clearly define our problem as well as the strategies to address them and to interrogate our assumptions and intended outcomes gave us a renewed perspective on the project. It has provided us with the confidence to plan according to the Theory of Change and not be deviated by nice-to-have distractions. One of the most heartening aspects of the project so far has been the enthusiasm of the teachers for the concept of learning through play and their engagement with the technology. WhatsApp groups, created to enable peer support, are buzzing as teachers explore with their new tools. In the classrooms, learners are eagerly engaging with their teachers' tablets and can hardly wait to start using their own tablets. We cannot wait until they see the Xbox Kinect and play with its mind-blowing games!

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Theory of Change



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