ACTIVE
LEARNING
HANDBOOK

LESSONS LEARNED FROM A FINNISH - NAMIBIAN COLLABORATION ON EDUCATION

FOREWORD

INTRO
We are excited to present this pilot project publication which shares some of the work and insights of two and a half years of Finnish-Namibian collaboration toward improving the Namibian education system.

BACKGROUND
The world is changing at an unprecedented rate driven by urbanization, global and cultural integration, digitalization and other mega-trends. This is happening in ever more unpredictable ways.

The question is how do we prepare our children and future generations for this evolving world? And is our current education system suitable to do so?

We want a future generation to be prepared personally and professionally, to have the necessary skills and prepare them for business, technology, to be responsible and empowered. Within all these requirements, education remains a cornerstone upon which this future is built.

Namibia currently spends close to a quarter of government expenditure on education. Despite this, statistics show an increasing number of unemployment and a widening skills gap between the 21st century skills required by industry and the outcomes of our current education system.

THE VISION
These questions were what brought us as a project team together. We share a vision of a generation that is well educated, has the freedom of choice and the skills and confidence to act thereon to sustain and improve their own livelihoods.

AN OPPORTUNITY FOR PARTNERSHIP
The long-standing history between Finland and Namibia of over 150 years set the stage for this collaboration and allowed us to explore ways of improving our education which has always been an integral part of our country's connection.

Globally, Finland is seen as a pioneer and world leader in education. The interest in this pilot project was to see how success factors of the Finnish education system could be adopted to a Southern African context to support similar positive improvements and learning outcomes, but in a very different cultural context and with only a fraction of the available resources to do so.

A CULTURE OF COLLABORATION
Throughout the pilot project the biggest steps and progress have been achieved through a culture of close collaboration, a keen interest to challenge ourselves, to share openly and freely and to show support in times of change or uncertainty. This foundation of trust has also extended to all partners and collaborators that have contributed to the project and we are grateful to any and all supporters that have made these activities possible including the Southern African Innovation Support programme (SAIS), Business with Impact (BEAM) funding by Business Finland, support by the Ministry of Education, Arts and Culture of Namibia, all of our project partners and many more organizations and amazing individuals.

LESSONS LEARNED
Looking back and at the results presented in this publication, it is encouraging to see the meaningful changes that can be achieved by working together. However small these might seem on the surface, a handful of tables or classrooms transformed can indicate a huge and inspiring change in our culture of teaching and learning.

A SHARED FUTURE OF CREATING IMPACT
We want to thank all organizations and all individuals who have contributed to this work. We look forward to your response, comments and future activities of making this available to even more learners.

In one way or another - whether in the northern Finnish winter or the warmth of the Namib desert – education touches us all.
Please feel free to share this widely!

In Windhoek and Tampere
1.4.2020

Tim Wucher, Elizabeth John, Chantal Claassen, Roel Rutgers, Maria Haapaniemi and Suvi Nenonen

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DOLOLEARN PILOTING FUTURE EDUCATION IN NAMIBIA

ABOUT THE PROJECT

The Dololearn project pilots Future Education in Namibia. The pilot focuses on three main aspects of Future Education namely i) new types of learning environments ii) progressive pedagogical methods and iii) e-learning. The project objective is to pilot and validate the Future School concept and develop a model that can be scaled nationally and regionally.

Progressive pedagogical methods for 21st century learning are introduced through teacher training and e-learning which are supported through creative learning environments at the pilot schools.

The general objective is to establish progressive teaching and learning methods in creative environments

and thereby lay a foundation for early stage entrepreneurial development in Southern Africa. The key beneficiaries are school learners as early stage future entrepreneurs who can make use of the new learning environments. These develop a culture of active and independent learning which lays the foundation for future entrepreneurial development.

"Learners benefit from progressive pedagogical methods and new types of learning environments. These develop a culture of active and independent learning which lays the foundation for future entrepreneurial development."

Dololearn further links organisations from different cultural and social backgrounds, from public and private sector and from different countries to collaboratively work toward achieving SDGs number 4 and 9.

KEY OBJECTIVES

1. To pilot progressive pedagogical methods and new types of learning environments by training seven teachers and redesigning and equipping the physical learning environments at two pilot schools.

2. To introduce the Future School concept in Southern Africa and to establish progressive education models in creative environments as a foundation for early stage entrepreneurial development.

PROJECT PARTNERS
Dololo Operations (Pty) Ltd (Namibia)
Tabled Namibia
Polar Partners Ltd (Finland)
University Properties of Finland Ltd

PROJECT COORDINATOR
Dololo Operations (Pty) Ltd

IMPLEMENTING COUNTRIES
Namibia

1 CO-CREATION PROCESS

CO-CREATION is a process of collaborative development of new concepts together with the users. It is also called collaborative innovation, meaning ideas are shared and improved together. The co-creation process is a **human-centred and holistic way** to develop something new, for example learning environments. Co-creation is also a change process: one can see new ways of doing things and give up some old ways of working. It is **learning together.**

The facilitator of a co-creation process often integrates various user-oriented, team-based methods to pick up **valuable ideas and insights of different user groups**. For example, in a school context the input from teachers, learners and parents plays a central role from the beginning to the end of the process. Co-creation emphasizes the user's involvement by asking how the user experiences are triggered and what exactly triggers them. By **engaging** users, the facilitator is able to create **trust**, and in the end, provide **ownership** for everyone who has been involved in the process.

**The first step:
a shared vision of the future**
Active learning was chosen as the guiding pedagogical approach in the Dololearn pilot project. Our team of facilitators from Finland and from Dololo Namibia, started the journey towards active learning practices in February 2018 by doing several presentations and workshops in Namibia for interested teachers and parents. The teachers from the pilot schools and school board members that took part in the workshops discussed different future scenarios and listed what the skills are that learners of today will need in their future working life. The workshops provided a **common understanding** and laid the foundation for a future vision for transformation.

**Co-creating together with
learners, teachers and parents**
Suvi Nenonen from University Properties of Finland facilitates co-creation of new learning and working environments. "The process of co-creation and use of diverse methods is a way to capture tacit knowledge from users: their dreams and wishes. Part of the process is also to recognise the fears: new things are sometimes scary and overwhelming. This is why working together is so important when something is changing."

In learning environment changes, she has noticed that in order to get the users of the space to feel **ownership** over the change process you need to involve them from day one. "We decided to use a pop-up workshop concept for the Dololearn pilot schools, because while users of the school environments varied from small kindergarteners to adults, it is still important **to listen** to everyone." The pop-up workshops were held at both pilot schools and the facilitators collected inputs from teachers, learners and parents by using various service design methods. The purpose of the workshops was to find out how the participants see and feel about their school today and what it could be in the future. We aimed to find out what **active learning** as a concept means to them. What kind of actions are included during the school day? How the classrooms are currently set up and what they could look like in the future if we think of active learning? What works well in the school and what does not? Can learning take place both inside and outside of the classroom? What could make learning **more fun**?

parents were able to write down their **wishes and worries** considering the pilot project. One station for example was dedicated for pictures of different kinds of classroom set-ups and participants were able to vote for their preferences. To also get the youngest learners involved, learners could draw their **dream school** or classroom. To our surprise this station even inspired the teenagers to draw and create ideas.

The pop-up workshop consisted of several stations, each with different kinds of activities. The participants were able to **move around freely** to share their ideas by writing, drawing and voting. Learners, teachers and

Setting the foundation based on the findings
The rich data that we gathered from the workshops was analysed and investigated in order to set the foundation for our pilot project

activities for the next years during 2018 and 2019 and many **culturally relevant perspectives** could be identified. Based on the collected material, we were able to understand similarities and differences between a Namibian and a Finnish school day, learning environment and school culture. The concept of learning inside and outside for example differs a lot due to the climate and weather conditions. In Namibia the days are hot and sunny, while in Finland the climate is much colder. Additionally, we learned about the differences in the symbolic value of the school building. These kinds of findings helped us to define the localized active learning principles. ●

Co-Creation workshop in Faith Primary School

The Dololearn pilot project focused on three specific areas:

1. Active learning pedagogy and teacher training with the aim of capacity building in active learning methods and a learner centred approach.

2. Active learning environment concepts with the aim to support new ways of teaching and learning.

3. Active e-learning to introduce and test new tools and technology to support learning outcomes and modern pedagogy.

2

ACTIVE LEARNING

ACTIVE LEARNING is a pedagogical approach where students are engaged in classroom activities, as opposed to passively listening to lectures. In a more traditional style of teaching, the instructor does most of the talking, restricting opportunities for dialogue between the instructor and students. In an active learning setting, the students are at the centre of the activity and learning focuses more on **how** students learn, not just on **what** they learn. In active learning the learners are asked to co-plan the learning activities with the guidance of an instructor and therefore the approach stands in contrast to traditional modes of instruction in which students are passive recipients of knowledge and tasks from an expert.

Active learning can take many forms. Teachers and students play an **equally active role** in the learning process and active learning strategies refer to a variety of collaborative classroom activities ranging from long-term simulations to five-minute cooperative problem-solving exercises. The learners will engage in small or large activities centred around writing, talking, problem solving, information gathering, project work or reflecting. They build knowledge and understanding in response to **opportunities provided and supported by their teacher.**

Are we training for the problems of today or for the needs of the future?

Active learning was chosen to be the guiding pedagogical approach in Dololearn pilot project and we, a team from Finland and Dololo from Namibia, started the journey towards active learning practices in February 2018. This included several presentation and workshops held in Namibia for interested teachers and parents. The pilot school teachers and school board members taking part in the workshops discussed what the needed skills are in future working life. The workshops provided a common understanding and future vision for transformation.

Change agents in action!

Traditionally the education sector is considered to be rather slow moving and making fundamental changes in the system takes time. Finland on the other hand has been rewarded for its dynamic approach to educational reforms and piloting actions. We wanted to use this agile Finnish mindset and combine it with strong local Namibian know-how to co-create a piloting process that would work in the Namibian school context.

As a result, a few teachers from both pilot schools were chosen as change agents. A change agent is a person from inside or outside the organization who helps the organization transform itself by focusing on matters such as organizational effectiveness, improvements and development.

These teachers participated in an online training course about Finnish education and pedagogy. The training included a 2-week Study visit and teacher training program in Finland. The program included meetings and discussions with diverse experts of Finnish education as well as visits to various schools and kindergartens to explore the Finnish learning environments and get hands on experience of the variety of pedagogical methods in use.

Each teacher created their own teaching experiment from the ideas they gained from the excursion to Finland. The change agent teachers conducted six teaching experiments that were implemented by them in the pilot schools. They chose topics suitable for the age group and

A change agent is a person from inside or outside the organization who helps the organization transform itself by focusing on matters such as organizational effectiveness, improvements, and development.

Visiting Honorary Consulate of the Republic of Namibia Timo Palander

Change Agent teachers in Study Trip in Finland

curriculum, including perspectives of sustainability. Both digital and face-to-face mentoring were used to support the teachers during the experiments.

Vegetable Garden for learning and play

One of the teaching experiments was conducted by Kindergarten teacher *Mari Coetzee* from Berg-Op Academy. "The idea of a "learning yard" came to my mind when I had to think of ways to make kindergarten more enjoyable and attractive for my learners. Having a garden at the school seemed like the perfect solution for children who are mostly come from families with farming backgrounds. I've dreamt of starting a vegetable garden and petting zoo for children to gain skills and experiences in addition to the theoretical information being taught. When we had to choose a teaching experiment, this seemed like the ideal time to start."

"We built the vegetable garden together because initially I was unsure of how the children would react to the gardening. Having them as active participants in putting it all together,

made them much more engaged to ensure that the garden would be a success. It has now been 1,5 years since we started the garden at our school yard, and we are still working in it daily. We just planted carrots and the children are still as engaged in this project as they were on day one."
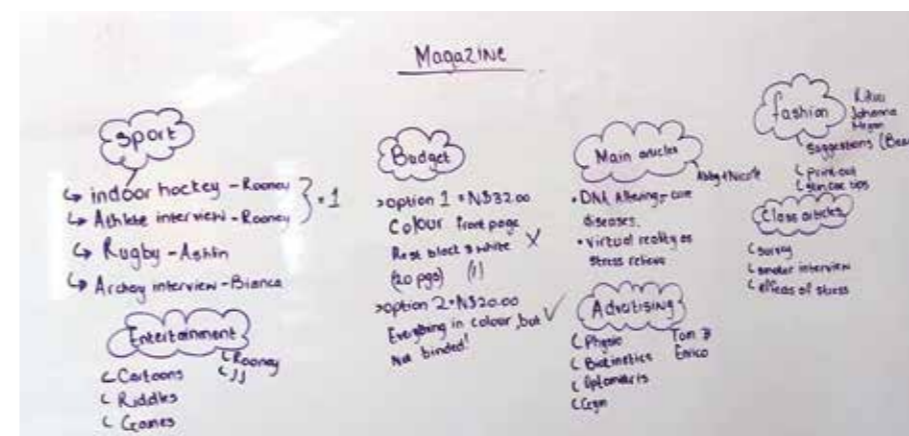
"This teaching experiment gave me various active teaching, active learning and social interaction opportunities with the learners! I was able to integrate all learning areas while working on this project. We **integrated numeracy** by using various shapes of bedding in our garden (circles and rectangles). We started a daily graph to show how many days it took from planting the seeds until we are ready to harvest (which acts as a daily counting activity). We **integrated language development** by our daily discussion of what differences/similarities we see in our garden daily. We use the names of the veggies we grow to do various **phonics activities** (carrots start with the c-sound and ends with the s-sound etc.) We use the vegetable garden as part of our **theme work** and to teach various **social skills**

such as sharing of watering cans, the older children helping younger children, table manners when we are eating the carrots to name just a few."

"Active learning is visibly taking place when children are engaged in the learning process and practically busy with an activity. During this time, their conversations and discussions centre around this project, without the teacher having to divert and keep their attention on the task at hand. It comes naturally and then I know we are actively learning!!

Mari Coetzee in Vegetarian Garden

Online Magazine -project

Another example of a teaching experiment was an Online Magazine created by Berg-Op Secondary school learners from grade 11 together with their teacher *Mareli Delport*.

"The Online Magazine seemed like a good teaching experiment because we wanted to **integrate various subjects, skills** and **promote writing skills** by exposing learners to something more interesting that just another mundane essay.

We started the project by electing our editorial team – after taking a short quiz about all the learners likes and dislikes – as well as what they think their strengths were. We divided all the different tasks of an editorial team and allocated each student with that they could be most creative in. This ensured that everyone felt comfortable and motivated to start with the task at hand."

The learners found out that there are a lot of things that needs to take place behind the scenes: proper planning of content for the magazine, advertising, getting everybody on board, creating fun sections for kids, counting the printing costs etc. The learners were able to broaden their perspectives and **get outside their comfort zones** when talking and interviewing various companies and individuals for the magazine. They learned how to make eye contact, how to be polite and set people at ease. One part of the interviews was included advertising our school and the new teaching methods.

Learners were **very proactive** throughout the whole process, **took charge** and **made all the decisions themselves**. They were comparing prices for printing, deciding to rather send out a digital magazine, they chose the colour schemes and the name of the magazines as well as the layout. I made just few suggestions

or asked questions that they might not have thought about to guide them along the way, but the rest was all the hard work of the learners."

The result was our Health Oh! magazine, inspired by the **biology background**, but **incorporating writing skills as well as planning and communication skills**. As a service to our **community**, we also decided to let companies in and around Okahandja advertise their products or services free of charge in our 1st publication.

The feedback from learners was that the project was very interesting, stressful at times, but that they really enjoyed it and were happy to be part of the very 1st health magazine of our school. They saw all the effort that goes into making and publishing a magazine. This teaching experiment gave us a wider perspective on **how to prepare students for the world outside the school environment**. ●

3 CHANGING THE ROLE OF THE LEARNERS

Teachers experimenting Active Learning Methods

CREATE — Combining parts to make a new whole

EVALUATE — Judging the value of information or ideas

ANALYZE — Breaking down information into component parts

APPLY — Applying the facts, rules, concepts and ideas

UNDERSTAND — Understanding what the facts mean

REMEMBER — Recognizing and recalling facts

ACTIVE LEARNERS are not simply sitting and listening. They are developing knowledge and skills by participating in the class and collaborating with each other. They demonstrate a process, analyse an argument, or apply a concept to a real-world situation. Learners are engaged in activities that guide them to reflect upon ideas and think how they could use them in practice.

Practical tools for teachers for active learning design can be for example the revised Bloom's taxonomy framework with learning objectives and the key states of thinking required at each level. There is a relationship between Bloom's taxonomy and the methods of teaching: the lowest levels of Bloom's taxonomy (rote memorization) are connected with the most passive forms of teaching and learning (lecturing). Likewise, the highest level of Bloom's revised taxonomy (creation) also correlates with the most engaging active learning methods (project work and teaching others). Thinking about the relationship between chosen methods of teaching, and the level of learning outcomes might be a good way of developing teaching to incorporate more active learning activities in schools.

Why do we do this?

Teacher trainer from Polar Partners Ltd *Maria Haapaniemi*, CEO and Founder, planned the pedagogical teacher training topics and elements during the pilot project. A series of workshops were held during 2019 and early 2020 for all the staff members from both pilot schools. Workshops were dedicated for introducing and trying out the active learning methods.

"We chose the revised **Bloom's taxonomy to be one of the theoretical frameworks for our active learning methods training in the pilot schools**.

I have used at Bloom´s taxonomy a lot as part of my teacher training sessions because in my opinion it answers to the ever so topical question of **"Why do we do this?"** so well.

"It all comes down to getting the methods we use as a teacher, in line with the learning objectives we have for the learners. If rote memorization and remembering facts by heart without really understanding the phenomena's behind them is considered a successful outcome of a learning process, then lecturing as a primary teaching method is fine. If, however we have other kind of

learning objectives such as applying and analysing the knowledge or to be creative and innovative around the topic at hand, we have to use a variety of other teaching methods as well to achieve the outcomes."

"During the active learning workshops, we covered the **basic structure of an active learning lesson plan**: Warming up phase, Activity phase and Reflection phase. We also went through a bunch of different active learning methods suitable for each of these three phases and practiced them hands on. The teachers were also introduced to a variety of ways

Groupworking in the workshop

Learners as the planners

Mari Coetzee has come a long way from a detailed lesson planner to an engaging instructor. "Before this pilot project I used to spend a lot of my time in planning the days ahead down to a T! Every minute of every day was me directing the day and it felt rushed, as every activity was slotted into a time slot. This caused a lot of stress, something that I believed carried over to the children. It felt like I had to redo the planning daily, because the day did not go" exactly as planned".

"After the training and the Study visit to Finland, I started to realise that the children, no matter their age, are so much more capable than what we give them credit for! They are **able** and **want** to be independent, however we usually do not give them these opportunities as we (adults) are constantly trying to do things for them because it will be done "faster" and "safer", but all that we are actually doing is taking away valuable experiences from them."

"I decided to change the way our daily activities are structured. I wanted the **day to be more child centred** and at a later stage in the year, **the children are able to be the directors of the daily programme.** They still need to do all the various tasks (morning ring/activities/crafts etc.) during each day, however they can structure the flow of the day. We also assist them in making these decisions, so for example, if it is a hot day outside,
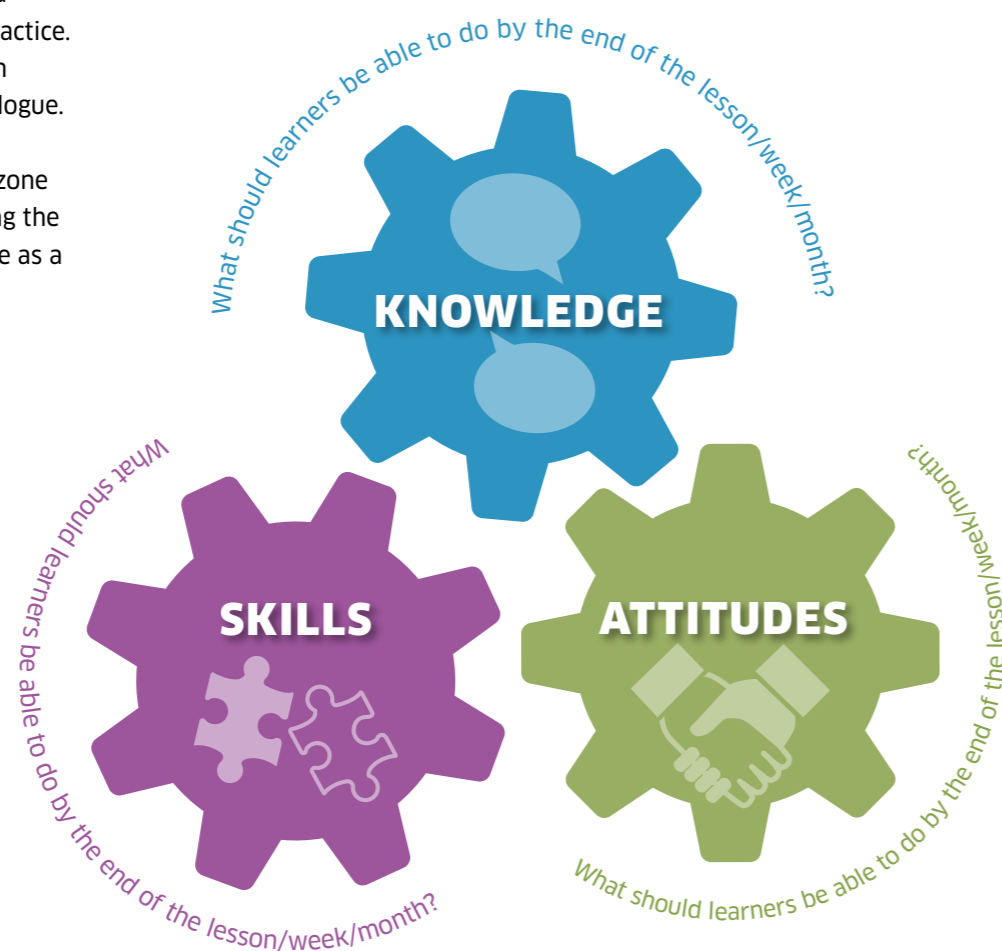
to re-structure the seating order in the class to fit the activity at hand. After the workshop the teachers were given an active lesson planning task for trying out the methods, they felt would be the most suitable for their own learners."

we will propose to them that we do our physical activities earlier in the morning. They still have the final say, however we guide them into taking all the various aspects into account."

"Today we have accomplished the goal that our learners of various ages and cultural backgrounds can create **their own learning opportunities** on a daily basis. I am happy to see children who **want** to come to kindergarten. It is amazing to observe how the children have developed is such a short time!"

With active learning maths comes alive

Christel du Plessis is a math teacher at Berg-Op Academy Primary School, teaching Maths for ages 10 to 13 years (grade 4 – 7). Maths is a crucial and passionate subject for her, and she feels the importance to develop a love for maths at an early age.

"I became interested in active learning in maths, because math can become very boring and difficult if learners have a negative attitude towards it. Thus, the more fun, active and interesting it can be made the better learners will understand and remember what has been taught."

"I had the idea of going outside for math lessons, because the change of scenery also brings a sense of excitement to a lesson. We have for instance been using **white board markers** on school windows and **chalk on the outside floors** where the students do sums and give each

other equations to do. We have played **card games** to improve their mental computation and had **active running games** to say time and order and compare."

"I find that it is refreshing for the learners to do something different than pushing papers and only filling in and writing from a board. With active learning methods they get to **build construct and live out their**

imagination. They feel a sense of control and achievement when they are given a chance to teach as well. **I have also given the role of teacher to the learners** where they have to prepare a lesson and teach the class."

"The learners thoroughly enjoy the active approach to learning math and look forward to going outside, when I take out the chalk their faces light up, because they know what

is going to happen. They love the competitiveness of our card games and **the fun factor** to our active math games.

I believe that by using active methods learners are more at ease and interested. Maths can be very boring, or Maths can be extremely fun and exciting." ●

Geometry Exercises

4 CHANGING THE ROLE OF THE TEACHER

After each trial it is important to reflect:

1. What went well?
2. What should be improved?
3. What did I learn?
4. What could I change next time?

ACTIVE LEARNING does not mean reducing the role of the teacher. The teacher is still in charge of their learners' learning process and lesson planning is very important. In fact, the more active the lesson, the more adult presence is needed to support the process and make sure everybody is on board with the assignments. Active learning does not have to mean a complete change to classroom practice. It is more about making the brain active and allowing room for dialogue. Active learning might challenge teachers out from their comfort zone and lead to a role shift from being the centre of attention to acting more as a guide.

LEARNING OBJECTIVES
S-K-A PRINCIPLE

What should learners be able to do by the end of the lesson/week/month?

KNOWLEDGE

What should learners be able to do by the end of the lesson/week/month?

SKILLS

ATTITUDES

What should learners be able to do by the end of the lesson/week/month?

You get what you measure

Teacher trainer *Maria Haapaniemi* has been training active learning methods to teachers around the globe. She has noticed that active learning methods might cause prejudices and scepticism about the effectiveness of them compared to the more traditional teacher centred methods. Not all the teachers are familiar with active learning and most of them have not experienced it when they were learners themselves at school.

"Usually, the learning methods and assessment system walk hand in hand. The more there is traditional lecturing and rote memorization, the more there is standardized testing in place. The more there is active learning methods such as project work, dialogue, case studies and peer teaching in use, the less there is standardized testing. You get what you measure. Although teachers often say that attitudes, and various skills are very important things to learn at school, usually the only learning objectives they measure are knowledge based."

"Structuring the desired learning objectives according to **S-K-A-principle** opens the teacher's eyes to the benefits of active learning. S-K-A stands for Skills, Knowledge and Attitudes. Each of them are equally important for the learners to grow as active citizens of the future. When the teacher starts to plan the lessons by thinking **what skills, attitudes and knowledge I would like my learners to learn on my next lesson**, it automatically brings the active learning methods on the table. You just cannot practice social skills or critical thinking by sitting quietly!"

Frieda Garoes having a story telling session

Individual learners form a community

Mari Coetzee from Berg-Op Academy has a kindergarten group of 3 to 7 year old kids. She finds using active learning methods with a multi-age group very beneficial for the development of children's **social skills** as well as for **doing pedagogical documenting.**

"Having children of various ages in the same learning environment is valuable, as **peer-teaching** constantly takes place. The child hears, sees and experiences the learning opportunity from a different perspective (usually a perspective that they understand better is from someone their own age.) Challenges that we sometimes face, is that the children can become irritated with each other. However, we quickly turn events like that into a learning opportunity of how we would handle such a situation and we discuss what emotions children experience and how we work through those emotions."

"I used to think that the various attention spans of different age groups will play a big role, however because the children are actively busy with a project, it is amazing to see how long they can actually be engaged in an activity. I also started to see and be more attentive to the various **individual learners** in my class. We constantly observe, take notes and evaluate the levels of learning taking place of each individual child. The observations and pedagogical documentation is extremely beneficial to us teachers to **see learning and development taking place in each child.**"

Group and drawing

Pre-school children preparing for drama session

Every child is a teacher in my class

Frieda Garoes is a grade one teacher from Faith Primary school. She was one of the change agent teachers of Faith Primary School in 2018 and has been actively trying out new methods as part of her teaching ever since. Frieda's classroom was one of the pilot classes that were transformed into an active learning space. The physical changes in the classroom have enabled her to change the structure of the lessons even more.

Instead of sitting passively in rows at tables, learners are now **actively using the classroom space**. There is a carpet in the front of the classroom where Frieda gathers her class to sit with her for story time. She engages the learners with questions or drawing tasks. After the story time, the children go to their tables and start to draw or write parts of the story they just heard.

"As you can see, **every child is a teacher in my class**. Every child is with their own desk and the chalk which I'm giving them, and they have to write as a teacher on their chalkboards. They do all the same things I am doing on my blackboard, on their desks. I sit with them on their seats and I sit with them on the mat in front and we are doing the job together."

Frieda has noticed that the new active classroom approach helps her to structure the school day to allow different learning experiences in different settings in the classroom. She is also happy to share her knowledge and findings with colleagues. By using different kinds of classroom settings, it is easier to explain to her colleagues what it means to **make learners active** during their learning process. ●

5 MENTORING

IT IS NOT EASY to keep on using active learning pedagogies. Without persistence or guidance, teachers can get discouraged and return to the more familiar and traditional style of teaching. It is important to engage schools to active learning pedagogies through co-designing activities and mentoring. **Activity co-design** refers to teachers at school collaborating on the design of new active learning pedagogies. **Mentoring** occurs when

teachers, who are more experienced at implementing active learning pedagogies successfully, work closely with other teachers to support them as they practice active learning pedagogies in the classroom. It is important to share the positive experiences as well as the lessons learned from situations where the active learning practices did not function in order to ensure the continuation of using these pedagogies in the future.

Support from North to South

Finnish teacher *Ulla-Riikka Ylitalo*, from Turku International School was one of the mentors during Dololearn pilot project. She visited Namibia twice during the project.

My five-day mentoring program in the pilot schools included **mentoring sessions** with each of the project teachers and two workshops about **Student-Centered Teaching** and **Encouraging Ways to Assess Learners**. Prior to my visit all the change agent teachers had gotten a teaching experiment task to complete with

their group of learners at school. Assignments were part of the teachers' study visit to Finland in August 2018, when they also visited our school.

To gain insight I learned about the history and politics of Namibia, memorized the school system and looked into the teacher training programs in the country. Soon after my arrival to Namibia I realised that I wasn't the

"I had the privilege to witness the **impressive changes that the change agent teachers had made** in their everyday teaching."

only one who had carefully completed their homework. I had the privilege to witness the **impressive changes that the change agent teachers had made** in their everyday teaching. **The teachers' openness to embrace** new techniques and their **willingness to change routines** was inspiring. I was pleased for every little bit I was able to contribute to boost the flow of the new methods. Using the new ways of teaching also brought a lot of questions, many of them about the assessment that was the most discussed topic with the teachers.

Maria Haapaniemi mentoring change agents

Ulla-Riikka Ylitalo and Faith Primary school learners

Elizabeth John
mentoring learners

On my second visit to Namibia we continued the project with putting the earlier introduced methods into practise with Maria Haapaniemi. Our workshop was about Developmental Psychology. The workshop feedback opened my eyes once again to the difference between knowing and understanding. Most of the teachers knew the methods but only understood the benefits after working through the process themselves in our workshop.

The Dololearn pilot project gave me a sense of fulfilment and space for **personal growth** as a teacher and a mentor. I am very grateful for the opportunity to take part in this project and happy to collaborate in the future.

Introducing e-learning

Dololo Operations team member *Elizabeth John* coordinated communication with the pilot schools. She was also mentoring teachers in the use of information and communication technology (ICT). As part of the Dololearn pilot project the pilot schools were provided with a portable internet connection and tablets for e-learning activities.

"We saw the need for more intense handholding and mentoring of the teachers after piloting the first educational software and

Teachers and facilitators:
Group reflection session

platform with the devices. We learned that teachers were not used to using tablets, instead they were more familiar with using mobile phones. Due to the lack of access to devices there is naturally the lack of computer literacy. We noticed that it is important to organise additional computer training sessions to ensure quality e-learning lessons from teachers to learners. It is good to keep in mind that learning new things always requires time. Additionally, new tools are not easy to use – you cannot learn everything overnight. The mentoring sessions provided much needed time for the teachers to learn and understand basic computer literacy and to be able to teach other teachers and learners.

I learned that digital literacy is lacking in Namibian schools despite the fact that the Namibian government had implemented an Information and Communication syllabus in schools, without training the teachers. Moreover, all Faith Primary School teachers that participated in our computer sessions can now use computers and had acquired the know-how and skills of ICT and digital literacy. " ●

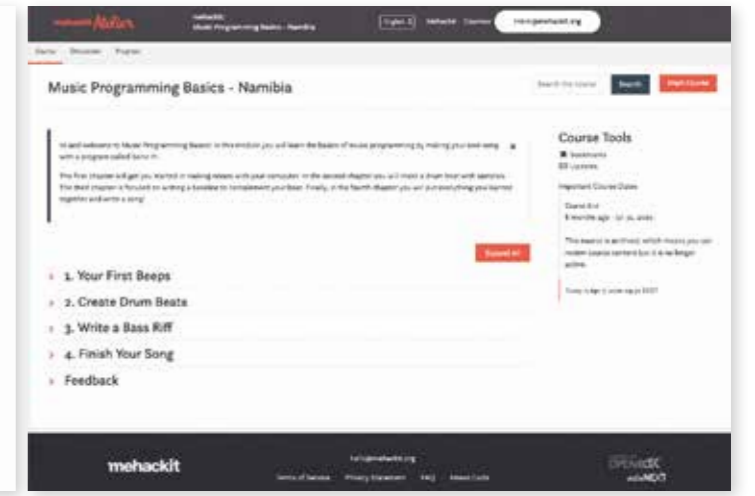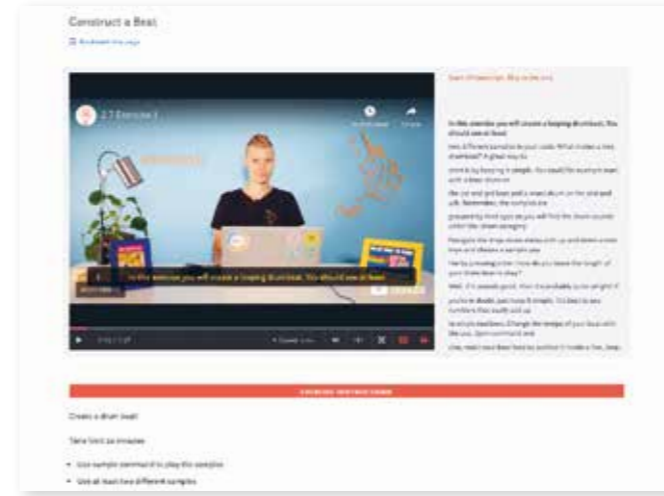Teachers and facilitators:
Active learning workshop

6 INTRODUCING E-LEARNING

E-LEARNING can be understood as the use of network technologies which **foster an anytime-anywhere transfer of information**. The E-Learning approach is **learner-centred**, and its design entails a system that is interactive, self-paced, repetitive and customizable. The educational advantages of this approach are manifold. For instance, **children might become more engaged** in their learning as they make active choices and navigate through the material, moving at their own speed as they **work with personalized content**.

By contrast, in traditional classroom settings, it can be challenging for teachers to activate the potential of all their students, particularly if the classroom is overpopulated and has children of varying skill levels. In these situations, the teacher tends to teach to the middle, and the slower children can't keep up while the faster ones aren't sufficiently challenged. Self-paced materials give all children the **opportunity to advance at their own speed**, and the teacher can be more aware of each student's mastery of the classroom material. These materials can also be accessed outside of the classroom as homework.

Berg-Op Academy teachers learning how to use video conferencing.

Supporting the Infrastructure and connectivity

When starting the pilot project, one of the very first activities was to **confirm what existing tools, resources and infrastructure was already present** at the pilot schools that would support online communication and e-learning. The internet connectivity was mapped in each of the classrooms at the two schools by Dololo team member *Tim Wucher*.

"We noticed, that while both schools had existing internet connections and basic internet infrastructure, these were primarily set up to support administrative work and not focused on supporting e-learning or online activities in the classrooms. The Wi-Fi coverage only catered for a small number of classrooms and the connection speeds where anywhere between 5Mbps and non-existent, making the use of e-learning inside the classrooms difficult."

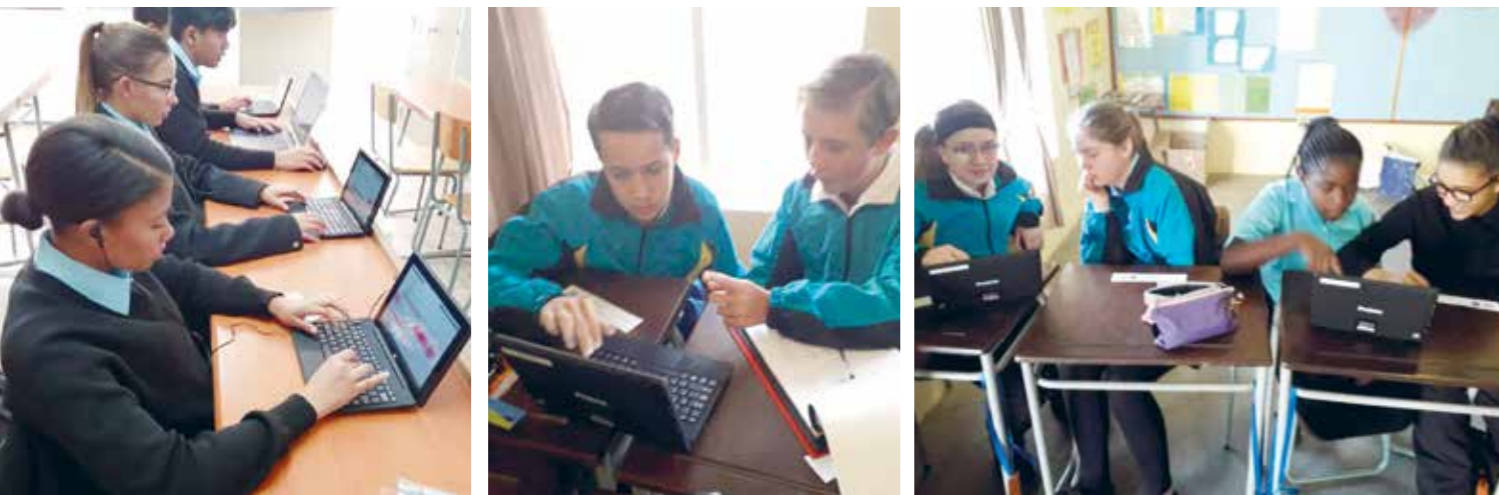One of the first steps toward e-learning was to provide the basic devices to establish a **reliable internet connection.** To make the solution as flexible as possible, a portable Wi-Fi router was provided that allows 64 devices to connect at the same time and since the router uses a SIM-card and a 4G LTE internet connection, it can simply be plugged into any power outlet. This allows the **internet to be portable** and to be used as and when needed by teachers.

"One of the empowering tools is for someone **to be able to connect to anyone in the world at any time with comfort and confidence**. This opens a world of new opportunities to connect with peers elsewhere in the world, to attend online training sessions, to access new tools and information and

One of the empowering tools is for someone to be able to connect to anyone in the world at any time with comfort and confidence.

most importantly to find existing solutions to some of the challenges that might be faced at our schools locally. Tools such as Zoom video calls or similar, allowed our Dololearn pilot project team to connect with the teachers without always having to drive to the schools".

Devices and access to technology

In order to effectively pilot some of the e-learning solutions during the Dololearn pilot project, learners had to have access to devices that were previously not available. Several devices were provided to each of the pilot schools, which could be used both as tables as well as PC computers providing a Windows operating system and interface.

Faith Primary School teachers learning to use e-learning tools

Learners learning to use e-learning tools

Because of the high cost of the devices not all learners of a class could be provided with devices and teachers had to be **creative** to split learners into groups so that each learner was able to make use of the devices.

The introduction of e-learning and the devices at each of the pilot schools, showed a very large differences in terms of familiarity with computers, the internet and the use of e-learning. A small number of teachers were familiar and confident with the online tools and could play an active role in teaching and providing support to their peers. Most teachers however, where not familiar with or comfortable using any form of computer or online tool to support their lessons and learning. The support for teachers is important part of the process.

Piloting Maths and Coding Programs

Amongst other solutions, the pilot project aimed at specifically testing two e-learning solutions – **EduTen** – a platform for teaching maths using gamification and a fun interface and **MeHackit** – an introduction to software and code development by programming music.

For each of the solutions, a group of teachers could volunteer to participate in the testing period. Basic training was done by the Dololo team in person as well as by Finnish experts from EduTen and MeHackit via video calls and online videos. As an **additional support**, the teachers were able to communicate with the trainers via WhatsApp groups.

MeHackit offers several different artistic approaches to coding but at our pilot project, the students were introduced to a music programme. It mixes coding with music composing which makes it fun and understandable for learners. At Berg-Op Academy some of the learners already had some experience with coding before being introduced to MeHackit. According to their teacher, *Romanus Kanyanga*, the new platform was quite **easy to use** as it was similar to the one used before. Besides few students who weren't as interested in music, the students were enjoying the new approach to coding.

In math classes EduTen Playground was used once a week as an additional teaching method. The message from both schools was similar: **the students got excited about math**. Some of the children from Faith Primary even went to school on Saturday for extra class, just to use the platform. The teachers were happy to see that students became more confident and helped each other with the calculations. It was clear that children were excited to do maths using the EduTen Playground.

But the students weren't the only learners during the e-learning pilot. For many of the teachers, the activities, **working online and with the new tools, required a steep learning curve.** Many of the teachers were not yet familiar with some of the technology and additional time was spent to support those that showed

a keen interest to learn. The Dololo-team did some basic training sessions with the teachers at each of the pilot schools to learn how to set up online voice and video calls.

Opportunities and challenges

This pilot programme showed that e-learning could present significant steps forward and provide new ways of learning to many Namibian schools and learners. Accessing and realising these opportunities is however not without challenges.

Some of the key take-aways from piloting the e-learning solutions as part of the Dololearn pilot project included learning just **how far we**

have to go to make e-learning a reality and readily accessible to not only a small group of learners but ideally to every learner.

Many of the challenges are easily spotted such as access to infrastructure, reliable internet and the capital required to purchase the technology and devices required for e-learning. What our project showed however, was that even if these are readily available, the level of experience, skill and confidence when it comes to using and applying technology is not yet sufficient to be able to readily introduce e-learning at most schools in Namibia.

What would be required would

be **well structured and focused programmes to upskill and support teachers in learning how to use and apply technology in their classrooms.** This would be considered the very basics of being able to make use of the huge opportunities that e-learning could present for the Namibian education system. ●
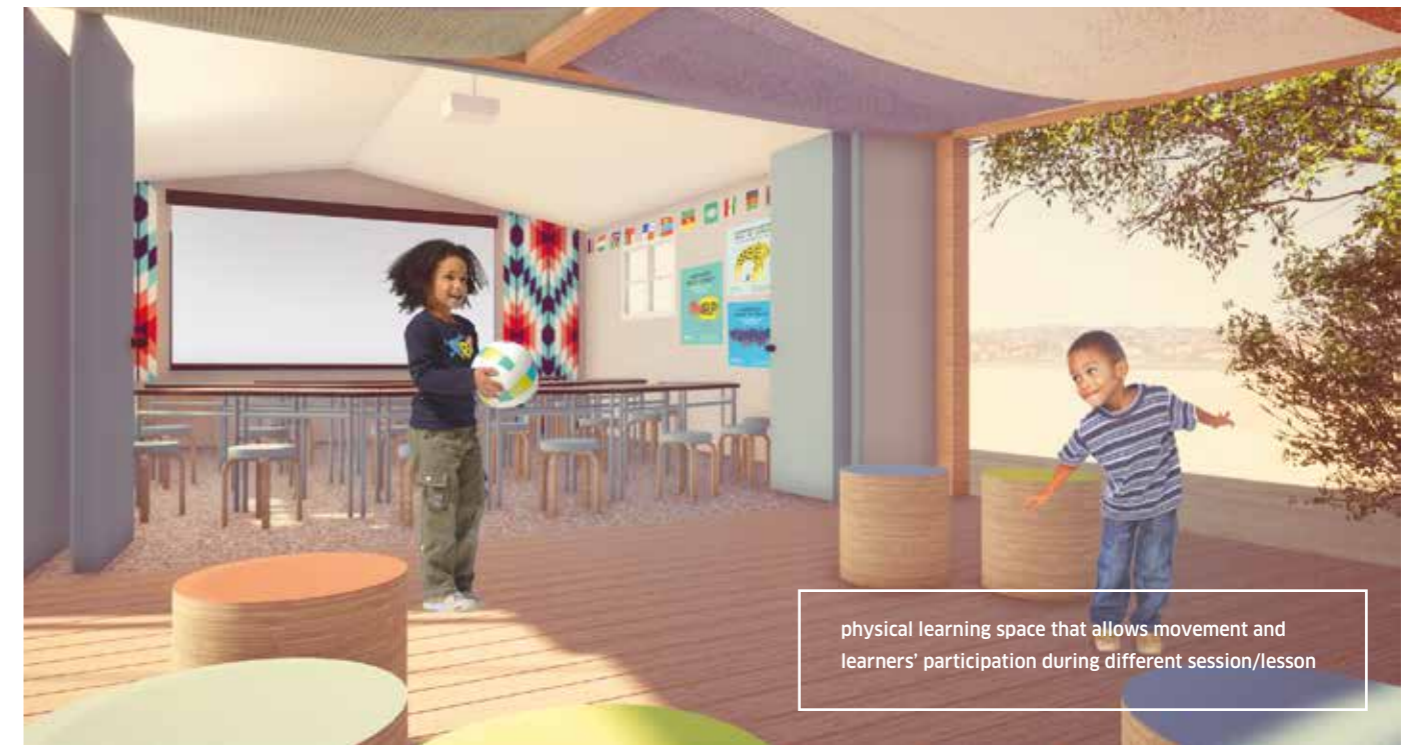
7 DESIGNING THE ACTIVE LEARNING ENVIRONMENTS

physical learning space that allows movement and learners' participation during different session/lesson

THE TERM "LEARNING ENVIRONMENT" can refer to an **educational approach, cultural context, or physical setting in which teaching, and learning occur.** Learning environments affect how individuals interact inside the space. An **"active" learning environment** is a physical space that **supports co-learning, co-creation and open discussion.** Active learning classrooms are not based on one-size-fits-all thinking. Instead, the goal of active learning environments is to create a space that can become a catalyst for change and a tool for teachers. **Active learning spaces give permission to do things differently.** Designing and outfitting a classroom for active learning doesn't have to be particularly complicated or excessively expensive.

Small pilots and space experiments
Suvi Nenonen from University Properties of Finland Ltd has been involved in many learning environment changes. "Instead of building a totally new school building, a school can be renewed by conducting small scale experiments by retrofitting existing facilities. By such an **experimental culture**, the idea is to put changes into practice quickly. In pilot experiments users and experts create, build and test new concepts of using spaces. One can retrofit spaces with **minimal costs** and **test new solutions** in a short space of time. User involvement ensures new thinking and learning by doing."
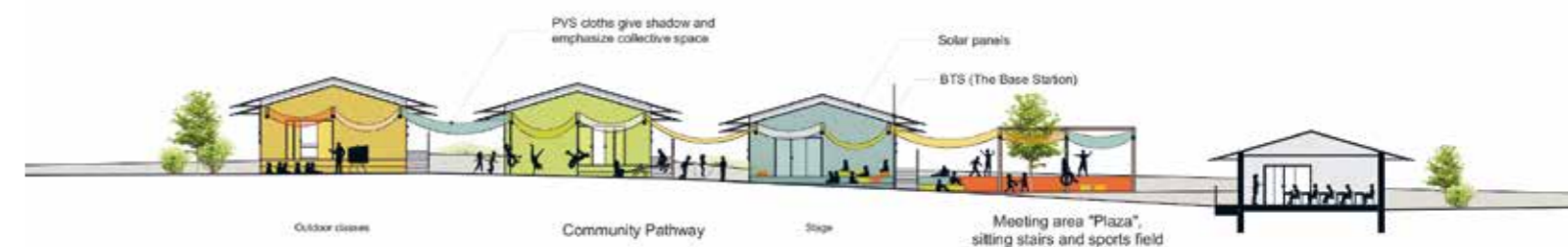
Designing the active classroom concept
The data that we gathered during the Dololearn co-creation workshops and especially the **user journey** information, provided good foundation to experiment in both inside and outside areas of the pilot schools. At Berg-Op Academy and

Faith Primary School the concept of active learning was the main focus during the learning environment design. The schools themselves chose which premises would be turned into active learning pilot classrooms. The information about the classrooms was gathered from users by taking photos, videos and measuring structures in the space.

Piia Viitanen, an architect from Finland developed the first concepts for the active learning environments. "The design of an active learning environment means that the space is adaptable to the task at hand. Instead of having a single seating option for learners for example, which is conventionally rows of tables, the **teacher is able to rearrange furniture to support the activity** and the function that he or she is doing with the class. Additionally, I want to design learning environment which encourages people to achieve their dreams and support them to be motivated for life long learning."

Ramkrishna Argawal, an architect working for University Properties of Finland Ltd had just finished his Master's Thesis about this school concept. He pointed out that alternative options can often include informal seating where learners sit in groups, so they can communicate, collaborate and interact better. "Active Learning environment for me means a space where people can share knowledge and learn from each other. It is more about how the surrounding environment motivates us to collaborate with different people and mutually learn from each other. An environment which promotes the student's participation and engages them in a more free way to think openly and which is flexible enough to suit the needs of different people. Further the combination of digital and physical learning environment can play a bigger role in active learning." Collaboration with schools and the Namibian team was fruitful: "To have a sustainable solution we used the **local material and expertise** to develop the furniture."

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The first pilot classroom concept was discussed with the teachers of both schools and changes were made according to the needs of the teachers. These discussions enabled the Finnish designers to bring in more local elements. One important issue was the size of the learner groups in the classroom. This was already a challenge during the co-creation workshops. While the classrooms at Faith Primary School for example were originally designed to accommodate approximately 30 learners, most class sizes are in the range of 40 to 50 learners per class.

Conventional solutions or requests often include "bigger classrooms", "more or new classrooms to be built" or "reducing group sizes". The

challenge with these solutions is that they are often not feasible or viable and cannot be achieved with the resources and financial budgets available to most public schools. Through the co-creation process, we could **determine some of the underlying use cases that lead to inefficient space usage with the aim of identifying alternatives.**

One such example was learning that a large part of the classroom is oftentimes considered the "front of the classroom" or the "teachers'

Two indoor classrooms at each of the pilot schools were identified and redesigned as well as one outdoor classroom at each of the school premises.

space" which can be as much as 20% of the total room size. While this area is mostly empty, it is not generally accessible to learners. A second example was the realization that as much as 10% of classroom space is sometimes used simply for storage of books, old papers, projects or other materials that are used infrequently. A third example was the observation that learners kept their school bags with them at their desk or hung them on their chairs. This meant that around 45 school bags were distributed and taking up additional space in the classrooms.
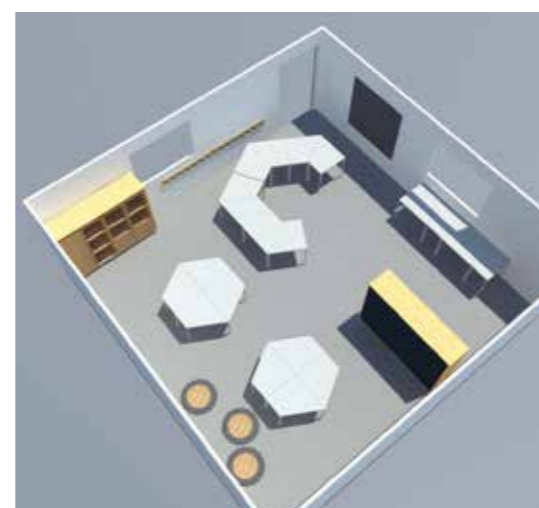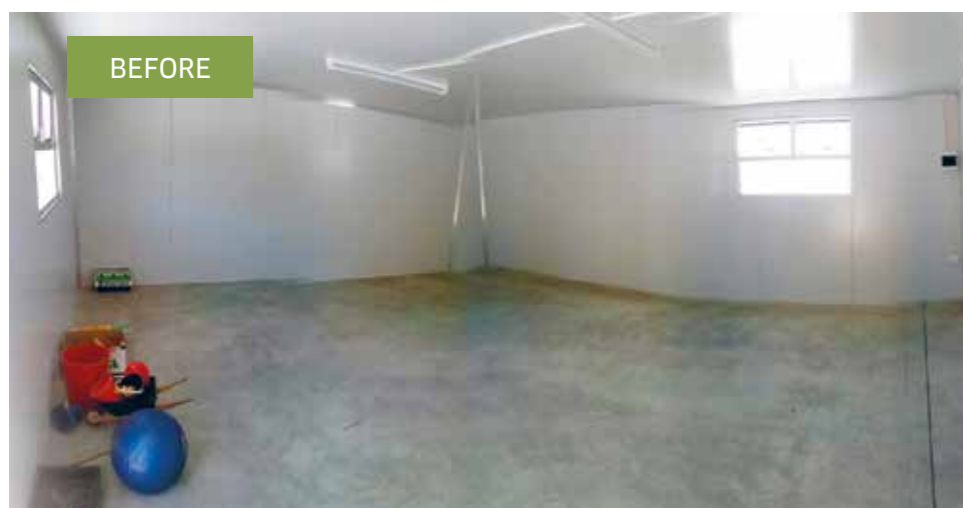
Active learning environment solutions
Together, we were able to develop alternative ways to make the best use of the learning spaces. During this process we focused on developing simple but effective solutions that could be sourced with limited resources and in a Southern African context.

The design of the above environments was a joint effort and final drawing and furniture was produced by Tabled Namibia. As co-founder *Roel Rutgers* describes "We tried to create **new types of furniture that allow for more activities to take place**. If you create flexibility into a classroom to have multiple activities, you can improve the way a child is processing the information he or she is being taught at school. "

The features that were introduced to the pilot classrooms included:

1. flexible tables
2. flexible chairs
3. shelves for additional off-floor storage and extra seating
4. carpets to the front of the classroom for comfortable interactions in a group
5. multifunctional furniture boxes used both for seating and for storage
6. storing the bags of learners on bag-racks at the front of the classroom instead of at their tables, where they take up a lot of space.

Features that were provided in the outside learning environments included:

1. informal seating options
2. group settings for discussion circles
3. presentation facilities for teachers and students
4. options for shade and fresh air during hot summer days and sunlight during cold winter days

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Outdoor Learning Environment trial

Physical environment sparked a power shift
The teachers were guided during the teacher training sessions on **how to rearrange the classroom** for the purpose of using different kinds of student-centered activities during the lessons. Changes that occurred in the pilot classrooms and could be observed was, that learners were able to work together in groups while the teacher moves around the classroom much more freely. By using easily movable tables it was possible to create a setting where learners are seated in smaller discussion circles to exchange knowledge and experiences.

During the Dololearn pilot project a new concept of pedagogy, which we called **Writing Surface Pedagogy (WSP)** was invented as a result of the active learning environment classrooms, where the new tables were being tested. The tables were painted with chalkboard or whiteboard paint, which allowed learners to write or draw on the tables.
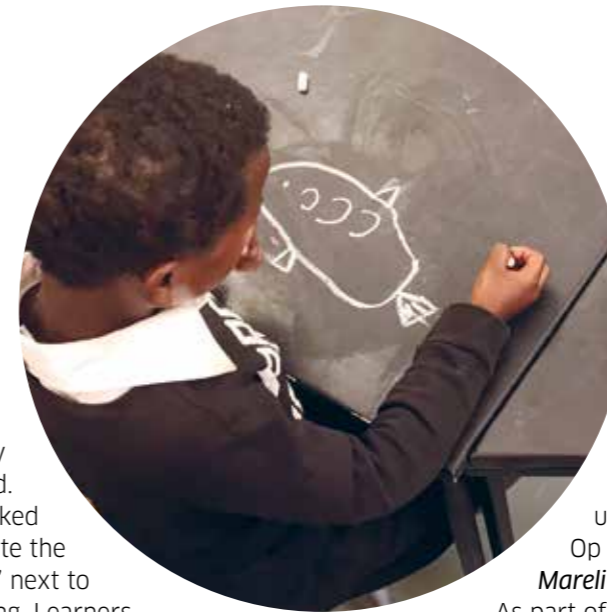
Additionally, the tables had shapes, which allowed **multiple ways of arranging** them in groups and rows. They made it easier to move around

coming from a situation where the teachers preferred not to use the outside space, we worked through small interventions with recycled materials like palletsand tyres to create enthusiasm and understanding, to create a wish for a full outside classroom setup that was delivered at the end of the project

and create different setups and shapes depending on the activity that the learners are busy with.
Blackboard and / whiteboards have traditionally been used on walls only and the teacher normally regulates the use or decides who can write on the board at what time. Through the introduction of tables with writable surfaces, the option of writing something and presenting it to others becomes shared and the writable surfaces suddenly **shared property in the classroom**. This can make a big difference for the learning culture. The tables with writing surfaces allow a much more active way of learning which is less teacher-centered. The power shift from teacher to learners is very tangible. As an example, one of
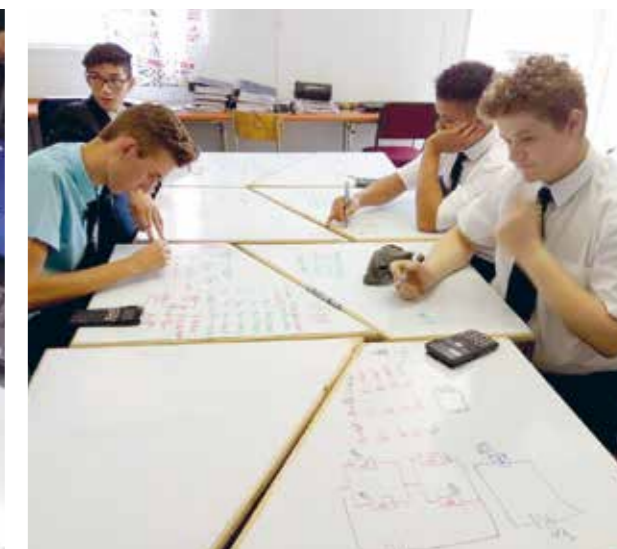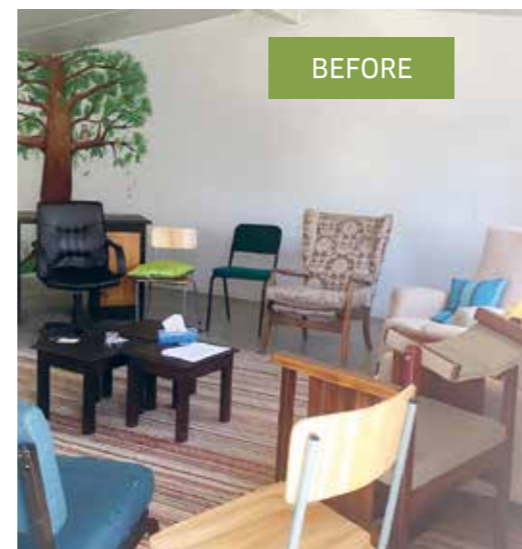

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the Grade 1 teachers used the following technique to explain a maths sum to learners.

First, the teacher wrote a maths sum on the table of each learner. The learners could then draw the number of lines for each of the numbers on the sum and count out loud, using the lines they had drawn for visual support during their calculations. By drawing the number of lines for their solution and then counting the number of all lines they could easily check their solution or make changes and corrections if needed. In addition, the group setting and each one having their own "blackboard" allowed learners to help each other to solve the maths equation.

This concept of writing surface pedagogy also allows **learning by doing** - it is easy for learners to wipe out any mistakes and try again. This encourages a culture of practicing rather than fear of embarrassment when making a mistake. Writing with a pen and paper in contrast is a lot more permanent and making a mistake can leave the learner feeling discouraged or bad without the option of easily correcting it. Ending with **a positive learning experience** and allowing a learner to find the right answer by correcting a mistake is key to keeping learners encouraged and motivated to take on more challenges.

Another great example was witnessed when Faith Primary School teacher *Frieda Garoes* used writing surface pedagogy to tell a story in class and asked her Grade 1 learners to draw a

fish based on the story she had told. She then asked them to write the word "FISH" next to their drawing. Learners could easily practise both drawing their favourite version of a fish as well as writing the word. They could easily clean the table or parts thereof and try again until they were happy with the result. They could look and move around the class to see what other learners had done and be inspired by the many different ways of drawing a fish - after all there is no "right way". This allowed the learners **the option to review each other's work,** give feedback and learn from one another.

Writing surface pedagogy does not only work for primary school learners,

as was shown by the concept used at Berg-Op Academy by *Mareli Delport*.

As part of the syllabus the students had to learn how to solve mathematical equations for electronic circuits. The tables were placed in eight groups, each with a different electronic circuit drawn on the writable surface. Once the circuit had been drawn, learners rotated to the next group where they first checked that the circuit drawn by others had been drawn correctly and then had to write down the first step of solving the equation. They then moved to the next group where they first checked the work done by the previous students and then added the next step to the calculation.

As the learners moved along the circuit, from one station to the next, they marked the previous learners' work and added their own calculations. This is a great example of how a monotonous maths problem can be made fun and interactive through **gamification**. The students get to be both teachers by being responsible for checking the correctness of work of other students, as well as learners where they have to solve the problem themselves. By encouraging continuous movement and activity during the lesson, learners get to enjoy the challenge of completing the 'circuit'. Since there is a queue behind them, they are also more likely to stay focused and engaged and have to actively think and interact with other students to win at the common challenge **through peer-to-peer learning.** ●

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8 SOCIAL IMPACT ASSESSMENT

MEASURING SOCIAL IMPACT is a way for organizations, businesses or individuals to see how their actions positively affect a specific community. It may be the result of an activity, a project, a program or policy and the **impact** can be intentional or unintentional, as well as both positive or negative. **Social impact assessment** (SIA) can be used as a tool to learn from cross-cultural encounters that are enabled through project-based development efforts. It can be used to develop potential and identify solutions to reach a wider target audience. Ideally these solutions can address imbalances in relationships between different stakeholders that are part of a target audience of a specific project or beyond.

Conducting interview

Assessment in Dololearn pilot project

During the Dololearn pilot project we assessed the **social change processes** invoked by active learning interventions. The pilot project was started with an ambitious goal in mind – to identify solutions based on the Finnish education system that can be implemented in the Namibian context with limited resources, to be able to improve the education system and provide an insight of what **Future Education in Namibia** might look like.

For us to be able to analyze and identify the effects and social consequences of the pilot project on the culture and community of the pilot schools, we conducted structured and anonymous interviews to all the pilot school teaching staff members. The initial interviews were conducted in February 2019 and were completed by a total of 53 teachers, 31 of which were from Faith Primary School and 22 from Berg-Op Academy. The final interviews following the project were completed one year later in February 2020 by 58 teachers, 37 from Faith Primary School and 21 from Berg-Op Academy.

Results of Pedagogical Capacity Building

At the core of our education system lies the pedagogical understanding of what learning is, how we learn and what roles we as teachers or learners play in this process. That is why the Dololearn pilot project focused strongly on teacher training and the pedagogy of active learning, with the goals

1. **To improve teacher capacity**
2. **To improve student participation and academic performance**

Some of the key indicators that we looked at included overall teacher satisfaction, teachers feeling inspired by their work and their working environments, working efficiency, teacher's personal and professional goals and their development. Interview respondents were asked questions or were given a statement and responded by giving a score between 1 and 5, where 1 means Totally Disagree and a score of 5 means Totally Agree.
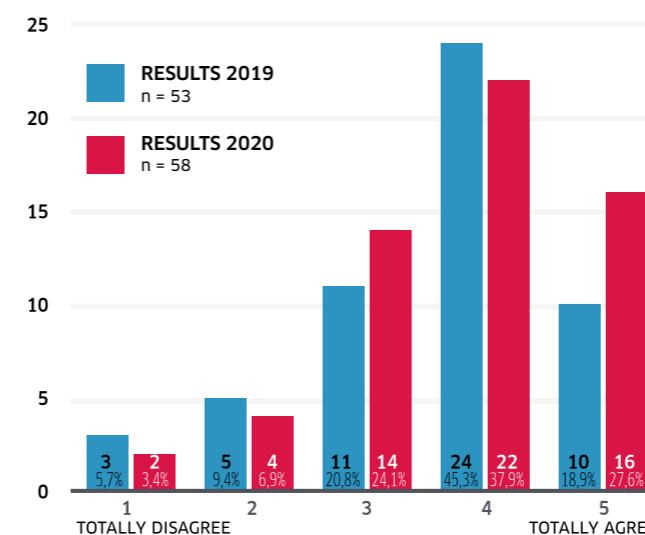
Interestingly, the only indicator which showed a decreasing score from 4.19 to 4.12 showed teachers feeling less clear about the goals of their school. While there are many possible factors that could contribute to this, one of the most likely is the challenges that come with making changes, doing many new things and exploring the unknown. This especially requires continuous communication and effective change management.

In addition to the above results, when asked whether their **capacity as a teacher** had increased due to the participation in the Dololearn project **58% of teachers gave a score of 4 or more out of 5.**
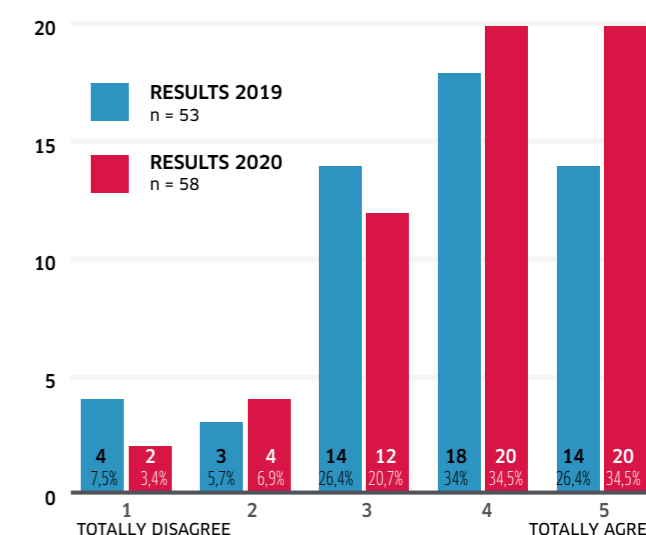The overall changes in the scores

The outcomes regarding teacher sentiment showed the following results:

- **Teachers feel more inspired by their work**
  The average score increased from 3.91 to 4.05 out of 5
- **Teachers feel that their daily working hours are more reasonable**
  The average score increased from 4.17 to 4.21
- **Teachers felt they could work more efficiently**
  The average score increased from 3.91 to 4.18
- **Teachers felt that their personal goals were clearer**
  The average score increased from 4.19 to 4.41
- **Teachers felt that they can collaborate better**
  The average score increased from 3.62 to 3.79
- **Teachers felt that they get treated more equally at their school**
  The average score increased from 3.66 to 3.90 out of 5
- **Teachers felt that they get more chances for professional development**
  The average score increased from 3.47 to 3.79

We collaborate well in our school work community

	RESULTS 2019 n = 53	RESULTS 2020 n = 58
1 TOTALLY DISAGREE	3 (5,7%)	2 (3,4%)
2	5 (9,4%)	4 (6,9%)
3	11 (20,8%)	14 (24,1%)
4	24 (45,3%)	22 (37,9%)
5 TOTALLY AGREE	10 (18,9%)	16 (27,6%)

I got treated equally in the school work community

	RESULTS 2019 n = 53	RESULTS 2020 n = 58
1 TOTALLY DISAGREE	4 (7,5%)	2 (3,4%)
2	3 (5,7%)	4 (6,9%)
3	14 (26,4%)	12 (20,7%)
4	18 (34%)	20 (34,5%)
5 TOTALLY AGREE	14 (26,4%)	20 (34,5%)

regarding teacher sentiment are not independent of the other changes happening at each of the pilot schools. The teachers played a big role in contributing to and making changes themselves. The interview results further show that the work done together with the teachers and the training sessions resulted in actual tangible changes in the classrooms and beyond.

Teachers made changes in their own classrooms and the way they teach More than half (28 out of 50) teachers gave a score of 4 or 5 out of 5 when asked whether they have made changes to their own classrooms and the way that they teach due to the Dololearn pilot project.
Teachers were more satisfied with the teacher facilities at their schools The average score increased from 2.72 to 3.28

Here it is important to note how much work was done by the schools themselves and the teachers getting together to make improvements to the school environment and social facilities in their own workplace, showing commitment and ownership which are key ingredients to creating meaningful change.

Results of Active Learning Environments
While the pedagogical understanding and methods lie at the heart of learning, the physical learning
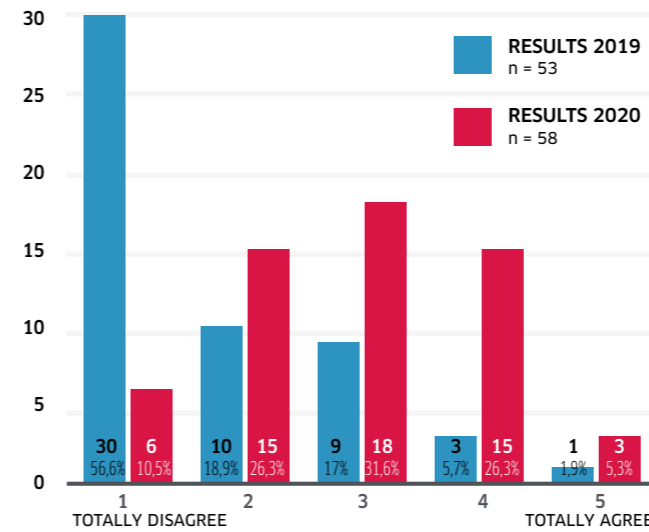
environments play an important role in supporting and enabling progressive pedagogical methods.

During the Dololearn pilot project we made changes to the physical learning environments changing two classrooms at Faith Primary School and two classrooms at Berg-Op Academy into active learning classrooms. We also piloted one outside classroom at each of the three physical locations (one at Faith Primary School and two locations at Berg-Op Academy).

Our goal was to introduce the concept of active learning environments and increase the usage of alternative classroom settings, while also improving the overall user satisfaction. This of course means that the teachers and learners get to enjoy their classrooms and school environment.

While the Dololearn pilot project made changes in only a small number of classrooms, these examples sparked a series of other improvements at both pilot schools. The effect of the co-creation and the inspiration of what learning environments could look

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The following results are from the teacher's interviews:

- Teachers were more satisfied with the **inside learning environments** at their schools
  The average score increased from 3.06 to 3.78
- Teachers were more satisfied with the **outside learning environments** at their schools
  The average score increased from 2.62 to 3.29
- Of 57 teachers, 72% gave a score of 4 or higher when asked whether their learners worked in groups and collaborated during lessons
- Teachers actively made changes in their own classrooms
  - 64% (32/50) of teachers indicated that they now use grouped tables
  - 24% (12/50) of teachers said that they encourage their students to leave their bags at the front of the classroom to create more space
  - 56% (28/50) of teachers said that they use alternative seating options during lessons

Footnote: The number of respondents differs for some questions since not all questions were answered by all teachers

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I am satisfied with the inside learning environment at our school

I am satisfied with the outside learning environment at our school

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I am satisfied with the e-learning (ICT) equipment and tools at our school

I made changes to my own classroom and the way I teach due to the Dololearn project

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like, encouraged the students, parents and teachers to show more initiative to do makeovers, cleaning days and renovation at the school sites.

These outcomes are noticeable considering that the physical changes by the pilot project were limited to only four classrooms.

The pilot classrooms likely acted as an inspiration for other teachers to implement some of the changes that enable active learning. For example, while we only made physical changes in two of the classrooms at Faith Primary School,

- four teachers said that they now used carpets for learners to sit on
- 7 teachers answered that they now encourage kids to leave their bags at the front of the class to create more space, and
- 20 out of 30 teachers answered that they now use grouped tables in their classrooms

Results of introducing E-learning
Good access to information and e-learning are undoubtedly an important part of the Future of Education and one aspect that was explored during this pilot project. While e-learning potentially offers some of the **most promising opportunities**, it also presents some of the biggest and **most complex challenges**. This especially when being introduced to schools in a Southern
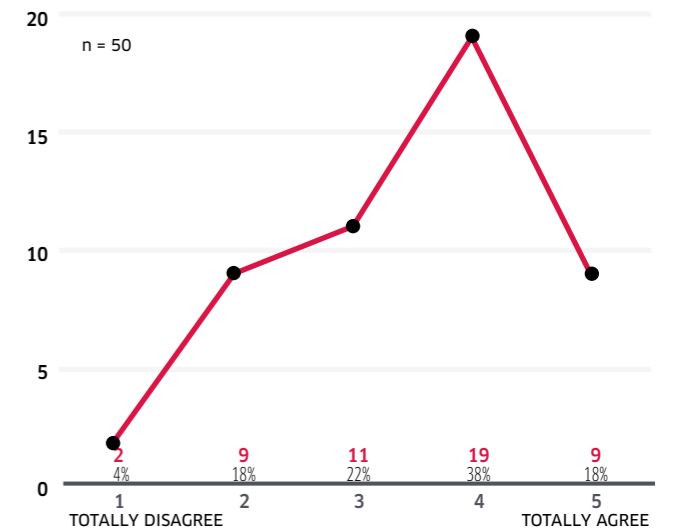
African context.

Some of the key indicators that we looked at during the Dololearn pilot project were communication, connectivity and individual access to e-learning (devices).

One of the first steps was to establish a **channel of communication** which allowed video calls for each of the schools to anywhere in the world using online video call platforms such as Skype or Zoom. This was used for initial meetings, planning as well as online teacher training for e-learning by Finnish partners. This also required **a reliable internet connection**, which was provided in the form of a portable router. This option was selected so that it can be carried around and used at different locations at the school, rather than a single Wi-Fi antenna with limited range. The third aspect was **access to devices** of which a limited number were provided to each of the pilot schools to experiment with.

Despite the limited changes that were made using the available resources and the short period of time, noticeable improvements were seen from the teacher feedback regarding e-learning. This is interesting since this area is also considered one of the most challenging solutions to implement and the Dololearn pilot project showed that we still have a lot to learn before readily being able

to implement e-learning at Namibian schools

- Teachers were more satisfied with the internet connection at their school
  The average score increased from 2.08 to 3.38 out of 5
- Teacher were more satisfied with the e-learning and ICT tools at their school
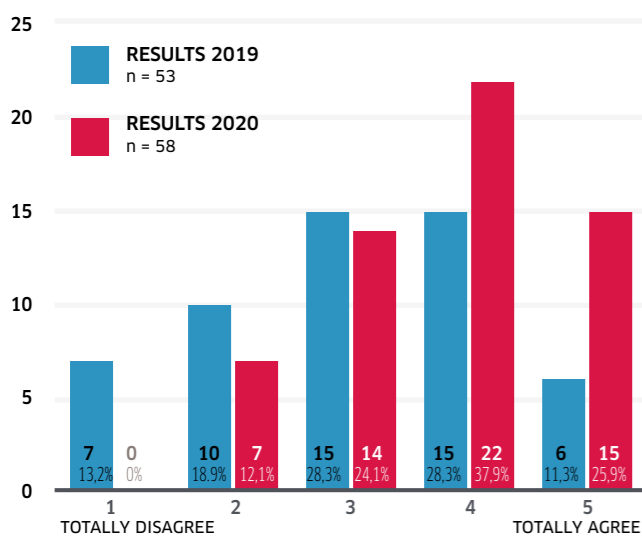 The average score increased from 1.77 to 2.89

Comparison of Interview Results
In all projects and interventions there are varying degrees of engagement, learning and growth. Some teachers might already be familiar with many of the concepts and thus may feel like they are not learning anything new while others might be skeptical or careful of the new or unknown. Additionally, others might simply not have had the chance to participate in all activities due to practical reasons or time constraints.
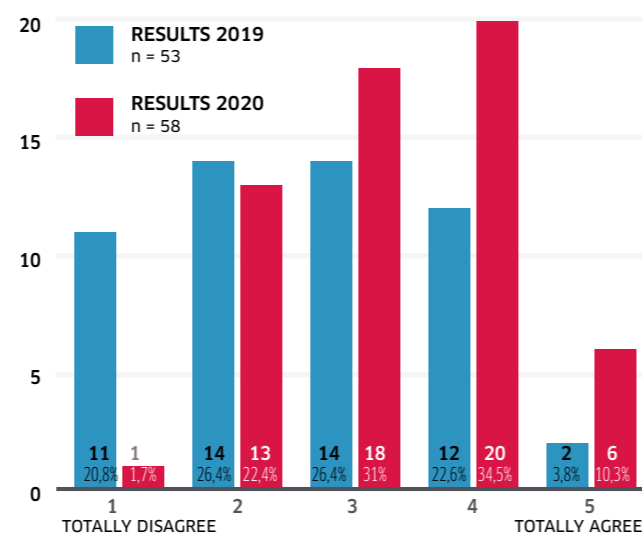
One of the project results that we were most interested in was to see whether any of the new information that was learned by teachers **led to significant and meaningful changes** in teaching styles, classroom setups and an overall approach to teaching.

In order to do this, the interview respondents were grouped in two groups. **Group 1** consisted of 23 teachers who had answered a score of 3 or less to the statement *"I learned*
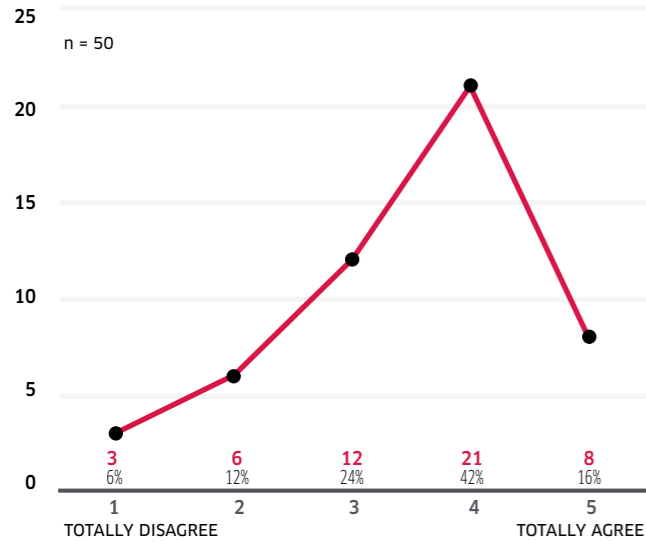
I feel that my capacity as a teacher has improved due to my participation in the Dololearn project

n = 50

1 TOTALLY DISAGREE	2	3	4	5 TOTALLY AGREE
3 / 6%	6 / 12%	12 / 24%	21 / 42%	8 / 16%

I regularly arrange my classrooms with different layouts for active learning

n = 57

1 TOTALLY DISAGREE	2	3	4	5 TOTALLY AGREE
4 / 7%	6 / 10,5%	17 / 29,8%	19 / 33,3%	11 / 19,3%

CONCLUSIONS

new teaching techniques from the Dololearn project". **Group 2** included 28 teachers, who answered a score of 4 or 5 more for the same statement. Interestingly, the group of teachers that felt like they had been able to learn something from the project, scored higher on every question in the interview without exception. These teachers were 27% more likely to have made changes to their own classrooms and the way they teach. They were also more likely to **feel that their capacity had increased**. Additionally, their learners were more likely to be able to move around the classroom, work in groups and collaborate actively during lessons.

The following table shows a summary of the comparison of the answers between the two groups.

These results indicate the **social impact especially within the school community** that can be achieved through such an intervention and pilot project of co-creating solutions. The wider impact to the local community is not measured with this data. However, the informal discussions during this pilot process with teachers, learners, parents and project partners provided feedback and testimonials, which indicate that the **experiences** are aligned with the presented results. We learned that the parents have been interested in activities which they have seen while visiting the schools. A further indicator that we could not measure but that can be readily observed is **a change of the culture at each of the schools** and their communities who are taking on more opportunities for learning and developing progressive solutions for their needs. This **growth mindset and a culture of joint exploration** can form an important part of progress for any community. ●

THIS HANDBOOK has summarises the outcomes of the Dololearn pilot project focused on active learning pedagogy and teacher training, active learning environments and e-learning. We hope that the presented data and feedback can positively impact our education system by presenting stakeholders with alternative and progressive approaches to teaching and learning.

In this phase of the project it has been interesting to reflect on the activities and see the different achievements during the two-year process. If there was one thing that could be improved on, it is communication, a lot of it - one could not overemphasize the significance of communication. The school is a wide community and communication between school management, principles, teachers, learners, parents and project members was not always easy to navigate. A big part of this project was also to be able to do cross-cultural communication, across languages, countries and schools from very different backgrounds. This can be both challenging but also very rewarding with plenty of new lessons to be learned across backgrounds and cultures. We hope that this handbook can be an influencer in encouraging this form of communication in education.

With the Dololearn pilot project we looked to explore ways of improving the Namibian education system and the overall return on investment for the current education budget. Our approach was to learn from the success factors of the Finnish education system and adopting these to a Southern African context. One of the first but perhaps most important lessons learned where that if we want to improve our education system and want to do so at a meaningful scale and pace, we need to focus on how we teach instead of **what we teach**. Changing the curriculum, subject matter and syllabus can be incredibly complex and opens a number of questions including assessment practices, accreditation and certification. Changing **how we teach** instead can be done in a relatively short time and with a fraction of the resources required but leads to greater improvements in terms of effectiveness of our education system.

In addition, we looked to demonstrate the impact that the active learning approach could have. Active learning can promote the delivery of high-quality education not only in Namibia but regionally in Southern Africa. We hope that the insights contained in this handbook will support better informed decisions by policy and decision makers in the field and potentially encourage the adoption of more innovative methods for reforming our education system.

The role of education is clearly emphasized in the United Nation´s Sustainable Development Goals (SDGs) and the Dololearn pilot project directly addresses **SDG Goal 4 - Quality Education**. This should ensure that by 2030, all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education. Achieving said SDG can further be supported by the methods piloted in this project including the delivery of physical learning environments that are child, disability and gender sensitive and provide safe, nonviolent, inclusive education facilities. The teacher training which focused on the adoption of active learning methods is considered a further effective approach to help reach the ambitious goal of providing high-quality teacher training to increase the number of qualified teachers, through international cooperation.

The successful implementation of the Dololearn pilot project can increase the awareness and appreciation and thereby the demand for innovative education models. It should encourage support from teachers, students, parents, public stakeholders and institutions as well as investors and funders of education.

A larger scale implementation of the solutions that have shown to be effective in this pilot study would require the full support of governmental institutions at a ministerial level and an ever curios spirit of exploration, a growth mindset and a passion for learning by all involved.

Thank you for all participants of the memorable learning journey in the Dololearn pilot project.

QUESTION	Group 1 Learned new teaching techniques, score 3 or less n=23	Group2 Learned new teaching techniques, score 4 or 5 n=28
I made changes to my own classroom and the way I teach due to the Dololearn project	2,74	4,11
I can make use of the outside Dololearn pilot classrooms if I want to	2,8	4,04
I can make use of the inside Dololearn pilot classrooms if I want to	2,95	4,15
I feel that my capacity as a teacher has improved due to my participation in the Dololearn project	2,91	4,00
My learners can move around freely during my lessons	2,70	3,54
I feel inspired in my work as a teacher	3,57	4,39
My learners work in groups and collaborate during my lessons	3,52	4,32
I am able to work efficiently during my workday	3,68	4,46
I regularly arrange my classrooms with different layouts for active learning	3,17	3,82