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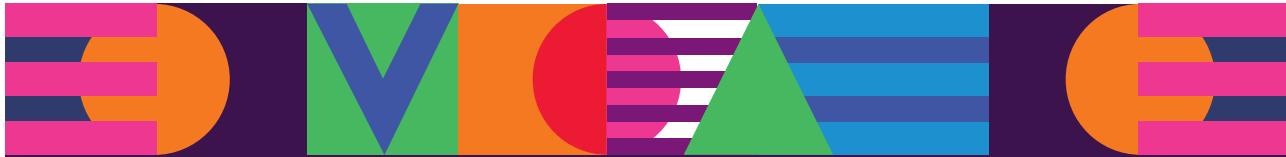
TOPIC 1 – A CHANGING WORLD

Session 1
One compelling goal – addressing youth unemployment

1.1 A Changing World

The Fourth Industrial Revolution (4IR), Artificial Intelligence (AI), catastrophic weather conditions resulting from climate change, epidemics and pandemics such as Covid-19, have resulted in our world changing at a quicker pace than ever before. There is much uncertainty in our lives, but what is certain is that our children will enter a post-school world that will be very different from ours. In order to cope in this changing world and find their meaningful place in a shifting economy, they will need a different set of skills and competencies.

So what does the future look like in this changing world of ours? What we know is that we are entering, if not already in the Fourth Industrial Revolution. We also know that computers are a huge part of our lives, and that the world as we know it now, in terms of jobs and opportunities - especially for young people - will be changed dramatically by these computers.

We know that computers are already being seen as the source of all knowledge (real and fake). We assume that we canuse a computer to find all that we need to know at the touch of a button. We know that computers will bring digital, physical and other systems together that will change our lives and our jobs forever. Computers will be able to do a lot, but there are things, unique to humans, that computers won't be able to do. Computers won't be able to be totally creative - they are not creative beings. They won't be able to form relationships with people and they can't perform unstructured tasks. These are the skills that will not be taken over by computers and which will open up huge opportunities for humans and keep us 'on top of the food chain.'

If we are very conscious of the things that we need and can do that give us the edge over computers, we can stay truly creative. If we can design in a creative manner, we can stay ahead of computers and enhance our creative intelligence. So, if we are to interact with this new changing world as humans, we need to enhance our creative and communicative intelligence. We need to think of ways of being more and more creative. We need to be able to strengthen our communication skills and our relationship intelligence because this is an area where computers can't compete. We need to have the skills and agility that don't necessarily follow structure because we know that computers can only operate in a structured environment. So it is important that we as teachers start to think about what this means for us personally and professionally. What does it mean to be creative, to strengthen communication skills and to have the skills and agility that do not follow structure?

1.2   The unemployment crisis

As we know, very depressingly, South Africa has an enormous employment crisis with large numbers of people unemployed, resulting in our country being labelled as the most unequal society in the world. Even more distressing is the fact that youth unemployment currently stands at 52.8% (and during COVID is closer to 60%). This is a sad prospect for young people's future in South Africa. Schools have a massive responsibility to ensure that the time learners spend at school is a good investment in future proofing them. Let's make sure learners spend their time at school in a relevant and productive way so that they can become successful and fulfilled citizens.

It is during these 13 years that learners have the opportunity to develop the competencies and skills that will make them an integral part of the new world, that will give them the edge over computers and enable them to develop the problem-solving skills needed to cope with any challenges that come their way.

In light of the youth unemployment crisis, we urgently need to ask if the traditional (let's call this 'chalk-and-talk') style of teaching is relevant. Is it perhaps obsolete and irrelevant? Will 13 years of traditional schooling provide learners with what they need to be employable, start their own enterprises or continue with their studies? In other words, are we future proofing our learners?

South Africa: Youth unemployment rate from 1998 to 2018
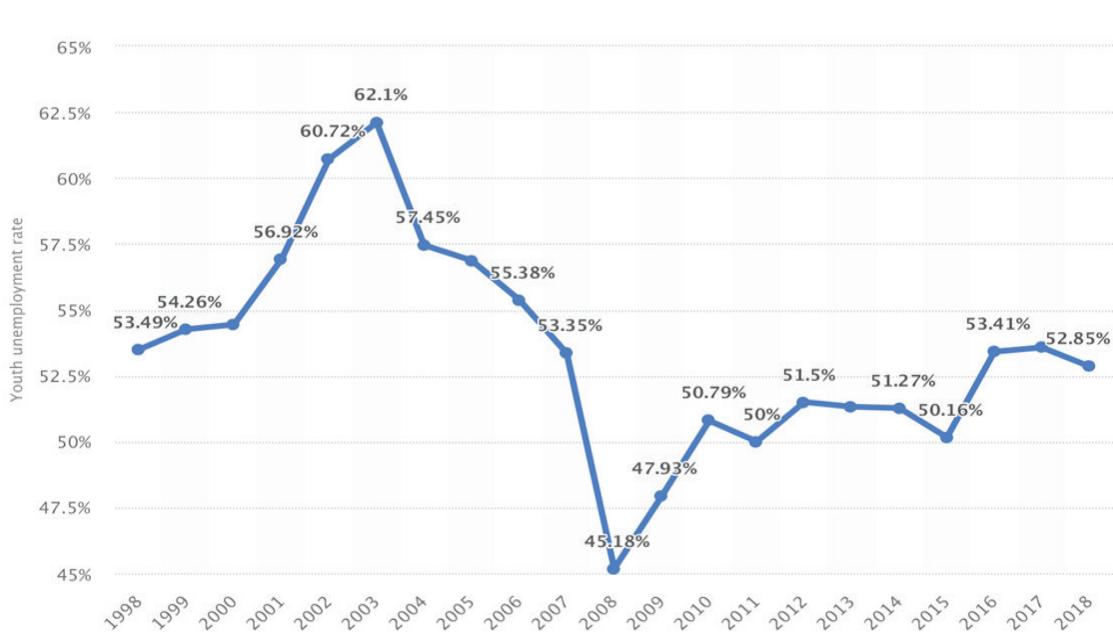
1.3 Teachers need to adapt

21st century learners are very different. They have a different way of approaching the world: they are tech savvy, they are impatient, they want to do things. They don't just want to sit and copy from an outdated textbook. They want to be involved and engaged and they want their classroom to be fun. As teachers, we have the amazing opportunity to meet the different needs of our 21st century learners, but for this to happen, we need to be ready to embrace a more authentic way of teaching that is results driven, action-based and relevant.

Teachers need to be able to reflect on whether they are ready for what it means to prepare learners for our changing world. It is comfortable to stay in one's old way of being and it is easy to use one's old teaching notes, but let's ask ourselves what we need to do to be ready to adapt to this new classroom.

As teachers, we are in an incredibly powerful position to impact the lives of learners in a positive way. It is teachers who learners sit in front of, day after day for 13 years, so it is teachers who need to buy into the fact that they are the most important frontline people to become agents of change in the lives of their learners. As frontline staff, teachers need to assess their changing role in the 21st century classroom, and commit to teaching differently and more effectively. This assessment and commitment may require a shift in mindset and reflection on questions such as: *Am I resilient enough to deal with the new demands of the 21st century classroom? Can I embrace the 21st century skills and competencies I need to help unlock the potential of every learner and help them thrive and become active members of the modern economy?*

Active learning activities **help promote higher order thinking skills** such as application of knowledge, analysis, and synthesis

Active learning activities **engage students in deep rather than surface learning**, and enable students to apply and transfer knowledge better
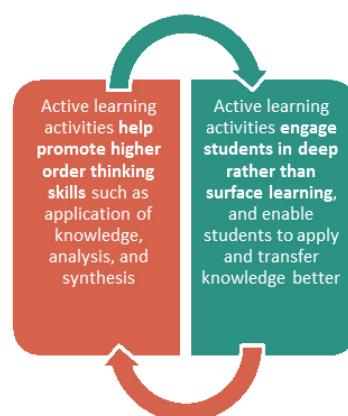
We all want to see our learners have the opportunity to become either gainfully employed as entrepreneurs, be employable and find jobs, or pursue an educational journey after school – and as teachers, we are perfectly placed to make this happen.

GO TO ACTIVITY 1   **THE WORLD AND TEACHING TODAY**
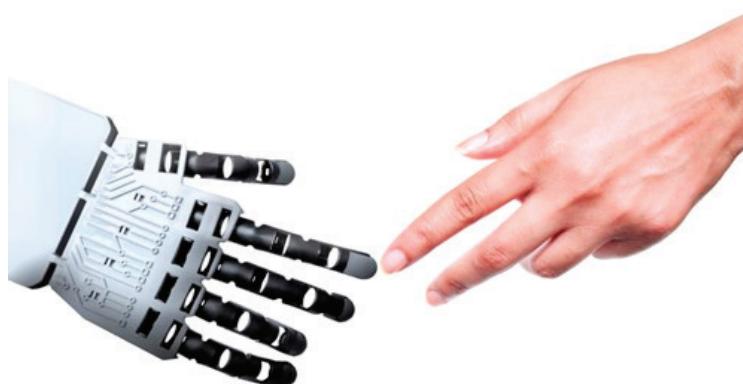
Session 2
Competencies needed for a changing world

2.1 21st century competencies (Character, Thinking and Connection)

The DBE's CAPS curriculum is intended to prepare learners for the changing world and the modern economy and enable them to participate fully in the modern economy. E³ is assisting the DBE by helping teachers unlock 21st-century competencies, such as character, thinking and connection, to ensure that learners can become entrepreneurs, are employable, or are able to further their education (the three Es of E³). This will help to significantly reduce youth unemployment.

Teachers are encouraged to use methodologies such as playful Project-based Learning to help learners during their 13 years of schooling activate and master 21st century competencies. These competencies will become the tools that will enable every young person to become solution-seeking, problem-solving "entrepreneurials."

There are various models used worldwide that define what these competencies are, and the DBE has been guided by the UNESCO-IBE Competence-based curriculum. The goal is for:

"…learners to leave school with the developmental capacity to interactively mobilise and ethically use information, data, knowledge, skills, values, attitudes, and technology; to engage effectively and act across diverse 21st century contexts; and to attain individual, collective, and global good" (UNESCO-IBE).

The DBE established the E³ programme in 2018. This programme uses less traditional and more learner-centred teaching and learning, including projects and games, to deliver the existing CAPS curriculum more efficiently so learners are better prepared for the modern economy. The goal of E³ is to inspire 100% of learners to complete school and for 100% of these learners to start their own enterprises, get a job or study further, i.e., **E**ntrepreneurship, **E**mployability and **E**ducation for tertiary and lifelong learning.

E³s vision is to create a new generation of engaged South African citizens, who are prepared and enabled, through the schooling system, to build the economic engine of the country. By transforming teaching and learning in South African classrooms, the E³ programme seeks to create the building blocks of an entrepreneurial nation, which is capacitated to address socio-economic challenges, including poverty and unemployment. Be it for employment purposes, employability or for further education purposes, an entrepreneurial mindset (opportunity-seeking and problem-solving) is the answer to the problems looming in the changing world post school.

2.2 Efficacy and personal agency for teachers and learners

Learners who are truly successful after leaving school will be those who have had many opportunities to engage in real-life scenarios in a practical way. As a direct benefit of 13 years of this type of learning, learners will develop confidence (because there is a safety net if mistakes are made) as well as self-efficacy and personal agency to accompany their 21st century competencies.

E³ has selected 3 core competencies on which to focus, which will develop and build entrepreneurial 21st-century, solution-seeking mindsets in the South African classroom. These competencies are:

·   Character (Citizenship, Curiosity, Resilience)
·   Thinking (Creativity, Critical Thinking, Reasoning)
·   Connection (Collaboration, Communication, Empathy)
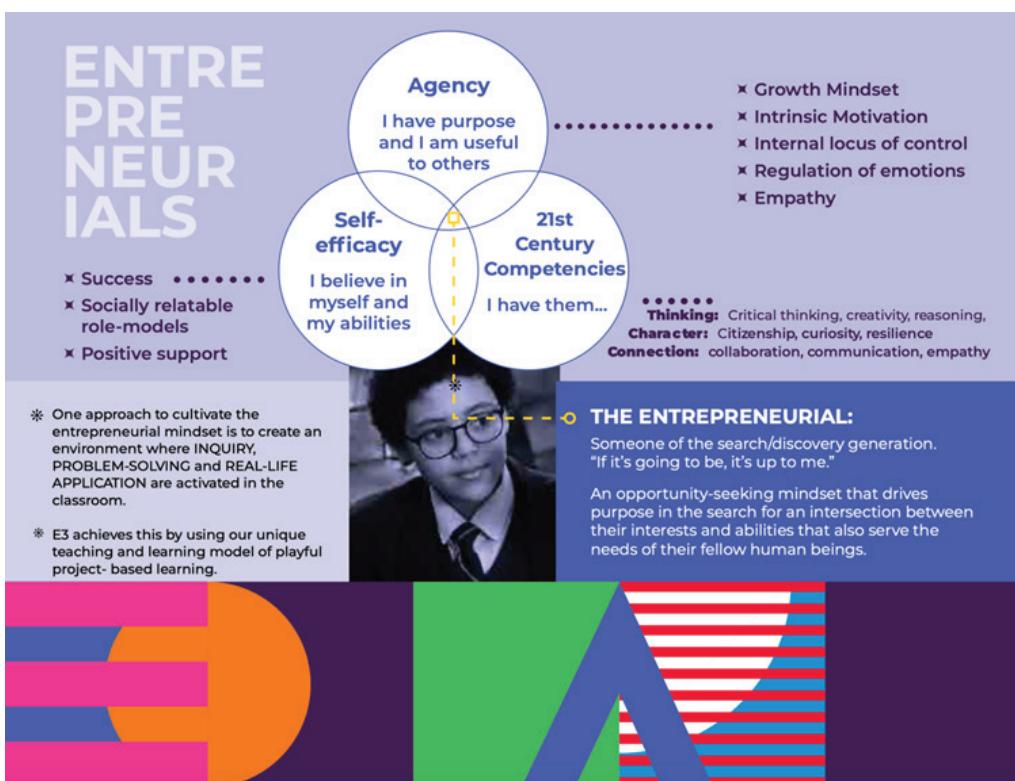
By activating these competencies, E³ believes that the following positive elements - as identified by UNESCO - will follow: lifelong learning, self-agency, and the interactive use of diverse resources and multi-literateness.

Character?
I am a loyal SA citizen who cares for my community. I am curious because I want to make a difference.
I bounce back...I am resilient

I am an E³ success story ...I can re-invent myself when the going gets tough

Thinker?
I love problems - I think of creative solutions and love to reason. I am always asking hard questions because I want answers...

Connector?
I know that working in a team and collaborating with others produces better results. It also improves communication and helps me to 'see'' others as a somebody. I have learned the true meaning of empathy

2.3 Addressing the issues using Project-based Learning (PBL)

The DBE understands the changing needs of education in SA as:
· The need for deep understanding rather than shallow knowledge;
· The need to build understanding across and among academic subjects, as well as within 21st century interdisciplinary themes;
· The need to engage learners with authentic real-world problems, data tools, and experts;
· The need for indicators of progression to allow for multiple measures of mastery

Project-based Learning (PBL) has been identified by E³ as the 'vehicle' to meet these

needs and develop 21st century competencies in learners as this approach provides problem-solving opportunities that stimulate solution-seeking mindsets. E³ recognises the "Instructional Core", i.e., the integration of skilled and knowledgeable teachers, engaged and active learners, and rigorous content — as pivotal to creating the shifts required to drive educational change at scale.

The E³ Project-based Learning programme champions progressive, constructivist methodologies as a way of doing what Bell Hooks (1994) refers to as, "Interven(ing), alter(ing) and disrupt(ing) the classroom atmosphere" in order to shift core beliefs and attitudes about teaching and learning. Through this programme, E³ also aims to realise the following three programme pillars:
·   Equipping learners with 21st-century skills;
·   Developing personal agency through unlocking a mindset that produces value and usefulness to others; and
·   Developing a belief in self and ability.

In this context, our role as teachers is to create positive learning environments by designing engaging and stimulating learning processes and projects. Through the E³ programme, teachers will be empowered to implement Project-based Learning (PBL) and Active Learning Pedagogies to unlock the competencies learners need for future success.

"The E³ value proposition is to provide THE platform for all education initiatives working with DBE schools who are striving to bring 21st-century skills into the pedagogy. Included in this process is the need for all learners to develop curious, enquiring, empathetic minds. They will do this in every subject by being encouraged by the teacher to conceptualise a need, develop a solution and design a project that meets the needs of their environment and that fulfils a purpose within themselves. Teachers will create the opportunity for fun and fascination and provide the direction and guidelines for the three stages of conceptualisation, process and project outcome. From a young age, learners will grow their empathy, become caring and develop a continuous problem-solving mindset that is driven by what they care about. It is this process that will establish hope and belief in the new SA of engaged youth." (Dr Maboya: Deputy Director General, Curriculum Policy, Support and Monitoring in the Department of Basic Education)

Session 3
Teachers, let's reassess our technical teaching skills

3.1 Transmission versus active learning pedagogies - fit for purpose teaching

The world is changing and what happens in classrooms also needs to change to keep up with society. The classroom needs to model society and incorporate activities that are more reflective of the new world so that learners are solving real-world problems that affect them. This authentic engagement with learning will give their lives purpose and meaning.

Teacher-centred learning is no longer appropriate as the only pedagogy in 21st-century classrooms. The way we teach should be fit for purpose. If we are trying to develop real-world competencies in our learners, we need to manage the classroom and recreate the activity in such a way that it feels like a real-world activity. How else will learners be able to assess their competency development? Because we are preparing learners for a different world in which to flourish, they need very different knowledge, skills and competencies, and values.

DID YOU KNOW?

FAIL is your **F**irst **A**ttempt **I**n **L**earning.

DIFFERENCES BETWEEN TRADITIONAL AND ACTIVE LEARNING APPROACHES	
Traditional	Active Learning Pedagogies
Teacher-centred	Learner-centred
Bigger class size	Smaller class size/groups
Isolated curriculum (subjects are taught separately)	Integrated curriculum (inter-disciplinary approaches to subjects)
Product-oriented	Process-oriented
Learning by repetition	Learning through various activities
Concepts are presented as facts to memorize	Concepts are presented as questions to be investigated
Basic learning	In-depth learning
Quantitative evaluation (numerical testing)	Authentic assessment

3.2 The importance of interdisciplinary learning

Knowledge is still important in the 21st century and traditional subjects like History, Geography and Geometry still have value, but we need to start connecting the subjects. They cannot be stand-alone entities. Inter-disciplinary knowledge is the order of the day in the 21st century.

Linked to traditional subjects, we need to add modern subjects such as entrepreneurship. We also need to connect all these subjects and all the knowledge to global issues like climate change and sustainable development. In terms of skills and competencies, many are needed in order to apply 21st century knowledge, and while they are embedded in most school subjects, they still need to be unlocked.

3.3 Character, Thinking and Connection (21st century competencies)

As touched on in Session 2, E³ is focusing on three core competencies to nurture within learners. In order to select these, E³ synthesised the 4Cs, the 6Cs, and various other models into a competency model based on Character, Connection and Thinking.

DID YOU KNOW?

Just-in-time learning is an approach to information and training that requires needs-related training be readily available exactly when and how it is needed by the learner.

- Character refers to the development of citizenship, curiosity, resilience, and the development of an opportunity-seeking, problem-solving mindset.
- Connection focuses on the importance of collaboration, sharing, communicating (especially with empathy), and of seeing everybody as a somebody.
- Thinking refers to creativity, critical thinking, reasoning and problem-solving – all skills our learners will need in a world that is changing rapidly. Clearly traditional chalk-and-talk-teaching alone cannot strengthen 21st century competencies. As teachers, we need to strengthen our technical skills in order to unlock Character, Connection and Thinking - competencies which our learners need to flourish in the new world of work - we must continue to address the different needs of our Millennials and Generation Z learners.

3.4 Active learning promotes the development of competencies

Traditional teacher-centred teaching has a role, as mentioned above, but this traditional role will diminish as teachers see how successfully they can unlock competencies when learners are doing the work and teachers are taking on the role of facilitator.

Millennials and Gen Zs thrive when they are actively involved - when they are doing and not just listening. Research shows that active learning pedagogies (ALPs) are more successful in developing 21st century learning than traditional teaching. According to well-known educationalist, Michael Fullan (2014), Project-based Learning (PBL), which is an Active Learning approach, is probably more closely associated with 21st century learning skills than any other form of learning.

3.5 How to start the journey to Active Learning – classroom management and group work

An immediate starting point is developing and refining your classroom and group management skills. Group work delivers a number of 21st century skills:
· 	Grouped learners lead the discussion, they are actively engaged.
· 	Grouped learners develop critical thinking, communication and teamwork skills.
· 	During group work, it is easier to see each learner as an individual as you visit your small groups.
· 	It is also easy to identify struggling learners and offer them 'just-in-time' learning and scaffolding as needed. This is good activity-based learning which forms part of PBL.
· 	Group work also satisfies social reconstructivism - an active learning approach which delivers the skills and competencies we are aiming for. According to Lev Vygotsky. group work is social because the learner is engaged in the process and learners learn from each other. It is reconstructivist because it is learner-centred and thus allows learners to construct their own understanding.

Active learning all starts with the learner, not the book. It is the best way to 'plug into' Generation Z. Chalk-and-talk can no longer be the only approach. We as teachers need the technical expertise to manage group work and strengthen other technical skills to enhance the learning process.

Session 4
Teachers, let's assess our current mindset and appetite for change

4.1   Are we ready for change?

We at E³ are motivated by a huge compelling goal – that every young South African must be gainfully employed, active as an entrepreneur and be educated for life after school. And we, as teachers, have an enormous role to play in this compelling goal.

As teachers, we need to consider our personal attitude towards change. Do we fear leaving our comfort zone? Or are we just too comfortable? Are we fixed in our ways or are we prepared to grow and adapt?

And so, the question is: Do you have a fixed mindset or a growth mindset? You are in an enormously powerful position to influence the future of learners if you are just willing to embrace change: change in the world around you and change in your own classroom.

So here is a quick checklist for you. Ask yourself the following:

- Do my students have opportunities to be creative?

- Are my students allowed to display their learning in different ways?

- Can my students document and reflect on their learning, exchange ideas and collaborate with others through, for example, *blogging*?

- Do my students have digital portfolios where they can display their progress and archive their work?

- Do I invite guests into our classroom, either live or virtually, to broaden our knowledge and global perspective?

- Are my students aware of how to be safe online and how to be good digital citizens?

- Do I myself model good digital citizenship by being present online and by connecting with others on social media?

- Do I make an effort to connect face-to-face or online with other educators at conferences?

- Do I model a growth mindset by stepping out of my comfort zone and trying new things?

- Do I believe that I would enjoy being a student in my own class?

4.2   A fixed versus a growth mindset

Why do some of us succeed and others not? Carol Dweck did a study to show that there are two mindsets which direct our lives: a *fixed mindset* or a *growth mindset*.

Fixed mindset
Many of us spend our lives trying to prove ourselves. In everything we do, we look for acknowledgement and confirmation: Am I OK? Will people think I am stupid? Am I a loser? Are the talents I have been handed sufficient for success?

The world is changing every day. The days of being an expert because you were "handed" certain talents or specialised in a specific field, e.g., teaching, are over. If you are not prepared to accept occasional failure and change with every setback, and thus learn from your mistakes, you will not be open to growth. Your mindset is fixed.

"A fixed mindset assumes a static stance towards intelligence, character and creative abilities – people with fixed mindsets believe their talents and intelligence are fixed at birth and therefore cannot be improved upon."

As a teacher, you are at the start of a new professional journey. There will be hurdles, but see them as tools for developing professional muscle and personal resilience. You need to keep on growing so that your learners will thrive – success is a personal choice. 'If it's going to be, it's up to me!'

Growth mindset
The other choice (and it is in your hands!) is to accept the following:
· Although I have certain talents, they are merely the starting point of who I can become.
· I believe that I can learn and be an expert at anything if I put in the effort.
· I appreciate feedback and know that making mistakes is part of growth.

"The growth mindset argues that talent and intelligence can be developed over time and with effort. Those with growth mindsets tend to thrive on challenges and embrace failure as a mechanism for learning and development."

What Kind of Mindset Do You Have?

Growth Mindset
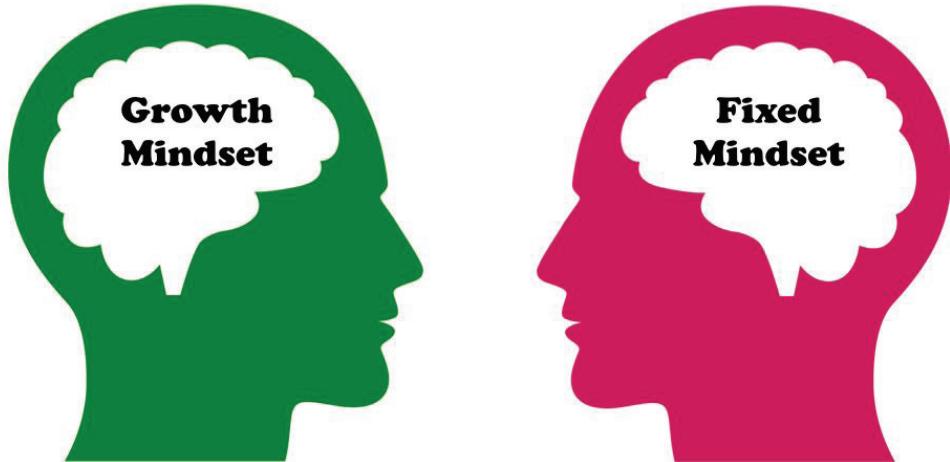
I can learn anything I want to.
When I'm frustrated, I persevere.
I want to challenge myself.
When I fail, I learn.
Tell me I try hard.
If you succeed, I'm inspired.
My effort and attitude determine everything.

Fixed Mindset

I'm either good at it, or I'm not.
When I'm frustrated, I give up.
I don't like to be challenged.
When I fail, I'm no good.
Tell me I'm smart.
If you succeed, I feel threatened.
My abilities determine everything.

Created by: Reid Wilson @wayfaringpath   Icon from: thenounproject.com

GO TO ACTIVITY 2 — **WHO AM I AND WHERE AM I GOING?**

As a teacher, you are at the start of a new professional journey. There will be hurdles, but see them as tools for developing professional muscle and personal resilience. You need to keep on growing so that your learners will thrive – success is a personal choice. 'If it's going to be, it's up to me!'

4.3 The Circle of Influence versus the Circle of Concern

GO TO ACTIVITY 3 — **CIRCLE OF INFLUENCE AND CIRCLE OF CONTROL**

Not only mindset, but also the manner in which you deal with your day-to-day frustrations can affect successful teaching in the 21st century classroom. Some problems can be managed, but others are beyond the control of teachers.

What about focusing on the things you can control and "parking" the situations you cannot control? Why waste time and energy on areas which you cannot influence? According to Steven Covey, every one of us operates in two circles, the Circle of Influence and the Circle of Concern. These circles represent the two areas in which you focus your time and energy. The inside circle represents situations in which you can influence or control, while the outer circle represents situations over which you have no, or very little, control.

Most people waste a great deal of energy and time being concerned about issues that they cannot change. In other words, they spend too much time in their Circle of Concern. Steven Covey believes that successful, people think and do things within their Circle of Influence and do not waste time on issues that they like to complain about but over which they have no control.
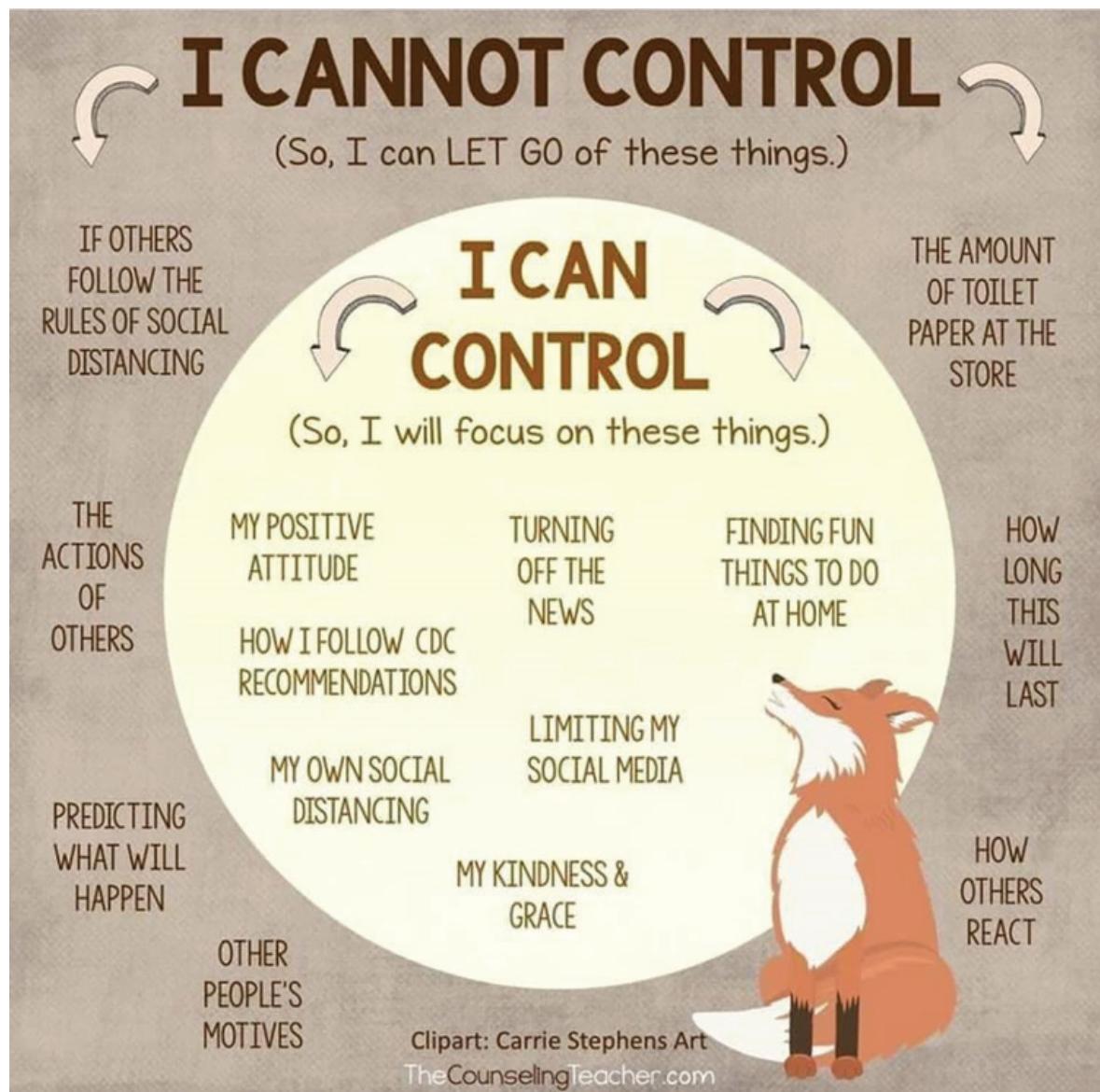
To make a real difference, rather focus on things you can influence. Make a difference, but by focusing your energy on being effective and changing unhappy situations. By doing so, you will be entering a cycle of success: by doing more and more things that you have control over, you are increasing your Circle of Influence and are entering a positive cycle of earning more respect and power.

Where do you spend most of your time and energy? Whenever you're getting worked up over something, ask yourself, "What can I do to change this situation for the better?"

Figure out some good ideas and act on them. If you really can't think of anything, realize that you're wasting valuable time and energy worrying about the issue. Let it go, and redirect your resources to an area where you can actually make a difference.

Some tips:

- Stop worrying about other people. Stay within your Circle of Influence.
- Stop worrying about something that has happened or will happen that
- you cannot control. Worrying paralyses you.
- Plan your actions. Be organised to avoid situations that will land you in
- your Circle of Concern.
- Practise staying in your Circle of Influence so that it grows bigger.
- As it grows bigger, the Circle of Concern grows smaller. You will feel more
- in control. You will be less stressed and become happier.

GO TO ACTIVITY 4 — **PERSONAL AND PROFESSIONAL BRICK WALL**

4.4 New knowledge and mindset are the gateway to change

But, without considering new knowledge about how we react to change, we may never open ourselves up to new beliefs, and maybe our behaviour will never change. And so a growth mindset is one whereby talent and intelligence can be developed over time and with effort. With a growth mindset one thrives, challenges and embraces failure as a mechanism for development. People with a growth mindset listen to new information. They are willing to change beliefs and assumptions and to start behaving differently.

"My effort and attitude determine everything. And so, If it's going to be, it's up to me. It is up to me and my growth mindset to change the world and to be part of E³'s compelling goal."

Session 5
Teachers, how can we embrace change?

As we consider the last session for the Topic: A changing world, we have come to realise that we all need to change and to adapt to the changes around us. How can teachers embrace change?

5.1 Six skills to help you embrace change

Consider these six skills as you reimagine the way in which you teach.

Skill 1 – A growth mindset to start with will mean that you are not afraid to try out any of the skills that follow. You are a risk-taker because you want to learn and you are not afraid of making mistakes.

Skill 2 – Collaborate, pair, share. You are not alone. Your colleagues, technology and your learners are now partners on an exciting new learning journey. Knowledge is constantly changing, so the textbook which is quickly outdated can no longer be the driver. We truly need one another. Pooling knowledge and skills is more productive than going at it alone. 21st century teachers can no longer be lone wolves.

Skill 3 - Our ability to dig deep, face our fears and try out new things in the classroom. With your growth mindset, you will no longer be afraid of taking risks and making mistakes. The 21st century needs more real-life problem-solving, solution-seeking teachers and learners who see so-called failure as a launchpad to new learning.

Skill 4 - Laughter and enjoyment. Have fun with your learners. Make this choice and you will build bridges to your learners. Laughter will also create an enabling environment for

your learners to try out new things without any fear of losing face because of failure. Accept mistakes and forgive yourself for making them.

Skill 5 - Embrace diversity in your classroom. Diversity comes in all shapes and sizes, not only in your classroom, but globally. Classrooms are diverse in terms of race, creed, colour, but also in language and the different ways in which learners learn and make sense of the world around them. Teaching has to become more personalized. Start working in small groups and see each individual learner in the group as a person. Watch your learners grow as you acknowledge them and their uniqueness. Watch yourself grow as they acknowledge you. You will know that you are doing well when you really understand Skill 5.

Skill 6 – Embrace happiness. This sixth skill is really an outcome of the above skills. If you develop a growth mindset, are prepared to collaborate, boldly try out new things, laugh and enjoy the journey with your learners because you see each one as unique and special, you will eventually reach Skill 6: Embracing Happiness. Happiness is a choice, but it is also the result of events in your journey as a teacher.

Event 1 – become a valued member of the teaching community.
Event 2 – you yourself value that community.
Event 3 – that community starts being valued by others. It's all about mindset and accepting that it is OK not to know, but it is not OK to do nothing about it.

Embrace change, become a change leader and watch as your learners follow you. E³ is here to help and support you on this often scary journey. Accept the challenge and change your school. Make it an exciting place where your learners are faced with exciting challenges every day. Make it a place of laughter and happiness, where these problems are solved and successes celebrated.

GO TO ACTIVITY 5 — **THE HAPPINESS TRILOGY**

We have reached the end of Topic 1: The world is changing. We acknowledge our challenges, both those of youth unemployment and the new world of work. We know that we have to adapt our teaching in terms of technical skills and mindset changes. We know that happiness is a choice and that we alone are responsible for the change we want to see. 'If it's going to be, it's up to me.'

GO TO ACTIVITY 6 — **TEACHERS YESTERDAY AND TOMORROW**

GO TO ACTIVITY — **SUMMATIVE ACTIVITY TOPIC 1**

TOPIC 2 – THE DBE PLAN

Session 1
What is DBE-E³?

1.1 The E³ approach

Because of the challenges that 4IR is bringing, the crises emerging around climate change and pandemics, and the alarming unemployment rates (particularly amongst the youth), the Department of Basic Education (DBE) wants to ensure that school leavers have the skills they need to find jobs, start a business or continue to a tertiary career.

E³ ('Entrepreneurship, Employability, and Education') is the national Department of Basic Education programme to ensure that:
- 100% of school learners complete school (and do not drop out); and
- 100% of these school leavers are equipped with the skills to:
    - **E** - become entrepreneurs in the future, i.e., start own enterprises;
    - **E** - become employable, i.e., get a job; or
    - **E** - become educated, i.e., stay at school or join a tertiary TVET, Technikon or University and successfully study further as a lifelong learner.
    - Combinations of the above.

Entrepreneurship
E³ champions learners who are people of the search and discovery generation, who believe 'if it's going to be, it's up to me'. They have a search and discovery, opportunity-seeking mindset that drives their purpose in helping others. They are not linked to a particular age group – rather they display a particular mindset: a common logic that drives their abilities and actions. They exist within established organisations and/or they create new ones.

In order for an education system (starting at school) to develop these learners, every element of the E³ approach must be unlocked. This includes the E³ mindset (self-efficacy, a growth mindset, resilience, an internal locus of control, and intrinsic motivation) and the 21st century skills (foundational literacies, competencies and character qualities, rooted in life-long learning).

Employability
IIn addition to specific skills a job might require, employers are often looking for what is known as 'employability skills' and 'soft skills'. These would include communication, teamwork, problem-solving skills, initiative and enterprise, planning and organising, self-management, and a commitment to life-long learning. Generic employability skills are important because the labour market is intensely competitive, and employers are looking for people who are flexible, take the initiative, and have the ability to undertake a variety of tasks in different environments. Employees with a capacity for change as the environment changes will be in high demand.

Collaboration between different stakeholders should be explored to create opportunities for a transversal solution to youth unemployment. This should start in the classroom and extend to building supportive ecosystems around schools and communities.

Education

As teachers, we are strong models in a learner's world. Good teachers model a love for learning, and continuous learning. This is excellent because one of the E³ goals is for teachers to unlock this love of learning and curiosity about the world within their learners. Thus:

- Teachers should be encouraged to take charge of their own professional development.
- Teachers should truly embrace the concept of lifelong learning in a fast-paced knowledge space.
- The "lone wolves", who in the past, would often embark on quality educational projects alone at their own school will now be acknowledged by "banking" SACE CPTD points for all the hard work they have accomplished.
- Not only will learners' learning improve, but if the process is honest and productive, schooling in South Africa will show positive results.

Of course, our learners should also be influenced to continue learning. In a rapidly changing world, lifelong learning will ensure success.

So not only will you benefit, but your school and most importantly, your learners will also benefit, as will the reputation of South African education, which needs to adapt to a changing world.

Session 2
The E³ process

2.1 Who will manage the process?

The E³ programme was commissioned and is owned by the DBE and is delivered in partnership with C.I.D.A. as the programme management and implementation partner and New Leaders Foundation (NLF), who are now known as DIG, as the monitoring and evaluation (M&E) partner. In addition, since E³ was initially being implemented only in the Intermediate, Senior and FET Phases (Grades 4 – 12), the programme has also partnered with Care for Education, who are experts in the development of thinking skills and competencies needed for a changing world within the Foundation Phase (Grade R to 3 learners). This partnership, in which Care for Education will provide excellent training material and specialist advice, seeks to ensure the continuous engagement of South African learners in active learning approaches, which include Play-based and Project-based Learning, throughout their schooling years.

2.2 The governance structure

The programme also has a robust governance structure to enable strategic focus and accountability. The programme has established two bodies, the Steering Committee and the Advisory Council, to oversee implementation, coordinate different work streams, and track progress. These two bodies comprise representatives from the DBE, C.I.D.A., DIG and Care for Education.

Session 3
How will E³ bring a solution?

E³ is a programme which will, by 2030, bring about a change in the South African national school education system. It will ultimately impact all learners in the SA school system (12.9 million learners).

3.1 The approach: Project-based Learning

Project-based Learning (PBL) is the vehicle that will be used to build the skills needed to achieve employability, entrepreneurial skills and the opportunity to enter tertiary education.

Authentic, real-life scenarios and activity-based learning, which is experiential and practical, and thus more fun and inspiring to learners, will be promoted. Tools and ways of thinking to better solve problems, both alone and with others, will be explored. In this way, learners will develop the relevant skills and competencies needed in a modern economy. There will be an intentional move away from wholly traditional teaching (if chalk-and-talk is fit for purpose, it remains valid) towards a more learner-centered approach that takes a play-based approach.

Research has proven that play is an essential vehicle for learning. Play, by nature, includes many different experiences from free play to more structured experiences. Play is also fluid, as children (and adults) navigate multiple domains of learning at the same time. Stimulating all aspects of a child's development, it is multi-sensory and tailored to the interests and needs of the young person. For example, through role play, children develop their emotional, social, thinking and language skills (Lillemyr, 2009 p.9). The Lego Foundation (2017) refer to five skills for holistic development that highlight the importance of a child's Emotional, Cognitive, Physical, Social and Creative Skills. The Lego Foundation explains that through play, children must experience agency (2017, p.11), be supported rather than directed, exercise choice and voice, and pursue their interests. For these reasons, Project-based Learning is an excellent vehicle or process, as it provides the framework for creating the environment where children can explore their interests through participating in a relevant real-life project that seeks solutions for other people and unlocks their own agency.

3.2 CAPS alignment

In each grade, an anchor subject is selected and an activity-driven project, which covers most of the content, especially in the trimmed ATPs - all the content required by the CAPS in a specific term will be written in such a way that teachers will be provided with a step-by-step recipe for unpacking the project.

Because Term 3 is generally the term in which the CAPS requires projects and case studies to be undertaken for SBA, in the first few years of the pilot, Term 3 will be the term in which PBL will be implemented, driven or anchored by the following subjects:

Grades 4 –6   (Life Skills)
Grades 7 –9   (Economic and Management Sciences)
Grades 10 – 11 (Life Orientation)

3.3 Assessment of the Projects

The project in Term 3 is part of formal school-based assessment and "counts for marks". The results will be recorded on the national assessment database, SA SAMS.

Items on the assessment rubric which are being updated to align with the adjusted ATPs, will be unpacked with teachers during training. The Formal Assessment Task for Term 3 (the term of the pilot) is a project, as opposed to other activities, and teachers need to submit a mark or a grade using the assessment rubric as a guideline. The results are monitored on SA SAMS. In 2021, the adjusted ATPs will be used to guide the content of the projects.

Although there will be a core or anchor subject housing each project as stated above, the project will encourage integration with other subjects, especially the Language of Learning and Teaching (LOLT). With time, teachers will see the value of collaboration in assessment as well.

3.4 Written by teachers, for teachers

To ensure that teachers take ownership of the projects and that the projects are relevant to South African school classrooms, the original projects were written by teachers, and scrutinised by Project-based Learning experts who acted as co-writers and peer counsellors. These projects have been updated and aligned with the trimmed curriculum. Due to Covid-19 restrictions, a team of educators was involved with the writing and it is envisaged that during training, Master Trainers will work with teachers to customise the projects for their local contexts.

Grade 4-11 projects that were written in 2018 and 2019 have been updated and recalibrated based on lived experience of teachers during implementation.

Small-scale trials (E³ "laboratories") will be carried out on different projects in subjects other than those selected for the broad implementation plan. Teachers involved in these projects will conduct small Action Research projects to test the approach and to start building up a local repository of original projects. They will report on the learner engagement, the results, the impact, and advise on to how they may be improved. See Cohorts 1-4 below.

GO TO ACTIVITY 7 — THE DBE PLAN - A GRAPHIC HARVEST

3.5 Theory of Change

NLF has supported the implementation team to develop a detailed Theory of Change (ToC) and Results Chain, which outlines E³'s intervention mechanisms, the pathways to change, and key indicators. The core approach to programme implementation focuses on three key intervention mechanisms, which are enabled by M&E and advocacy.
These are:
· training provincial master trainers to train teachers;
· providing teacher development and support; and
· transforming teaching and learning in the classroom.

The Theory of Change also addresses three critical workstreams to enable the above interventions:
• School Implementation
• Partnerships
• Institutionalisation

3.6 Monitoring, evaluation and learning (SA SAMS)

•   **The pilot**

A three-year pilot (2019 – 2021) was launched at the beginning of 2019, which rolled out E³'s Project-based Learning approach in Gr 4-6 Life Skills, Gr 7-9 Economic and Management Sciences and Gr 10 Life Orientation across 350+ schools. In 2020, the roll-out of Grades 4-10 will extend to 600 schools.

•   **Role of M&E**

The role of the M&E is to support the programme by clearly defining the change that is intended, testing theories and assumptions on how change would be achieved in the South African context, and in gathering evidence against this intended change along casual pathways, from implementation to results, for the purposes of learning and improving implementation.

•   **M&E evidence**

The pilot and ongoing M&E processes will therefore test aspects of, and provide adequate evidence on, the following:
-        the implementation of the programme (number of training sessions and attendance; other engagement indicators);
-        the effectiveness of training and skills transfer (assessment and observations);
-        the quality of teaching (teacher practices reflecting changes in knowledge, skills, attitudes and values) and learning taking place (learner outcomes from SA-SAMS; teacher behavioural indicators); and
-        the changes in learners' knowledge, skills, attitudes and values (survey and results). From a longer-term perspective, it will test the impact of E³ in schools on schooling and post-school outcomes.

3.7 Lessons learnt from the 2019 baseline and plans made to address challenges

The lessons learnt from the baseline study conducted in 2019 are briefly outlined below, and it is these recommendations that have informed the updating of this manual:
Lesson 1. Current understanding of E³ is limited.
Lesson 2. Knowledge of PBL is limited.
Lesson 3. Training did not adequately prepare them for classroom implementation.
Lesson 4. Providing adequate support is needed to manage the rapid E³ implementation and roll-out.
Lesson 5. Failure to clearly and timeously communicate E³ plans, roles and requirements hampers effective implementation.

E³ plan of action to respond to the M&E:
Leading to the July to September roll-out, the following support interventions were planned and are being carried out to address identified challenges:

Dec 2019: Tested training manual with Free State DTDCs Jan 2020: A DCES meeting was held to gather first hand feedback. Feedback from the provinces was also included in the update as the manual and projects were checked for language and other changes.

Jan/Feb 2020: Writer's workshop (teachers and officials) (28)

As a result of COVID-19, the roll-out was stopped and the Implementation team decided to focus on learning as we were not permitted to access schools and therefore could not reach learners or teachers. An online course was created and thus far, 130 Master Trainers have been trained to assist in the training of teachers in 2021. This training will start in May 2021 and end in July.

Since the 2019 Baseline Report, a new Synthesis Report (2021) from the monitoring and evaluation team has shown that teachers had a remarkably challenging 2020, struggled with

the new normal (especially the online training) and are needing even more support. Please feel free to ask questions if you are uncertain - you are not alone!!

GO TO ACTIVITY

SUMMATIVE ACTIVITY
TOPIC 2
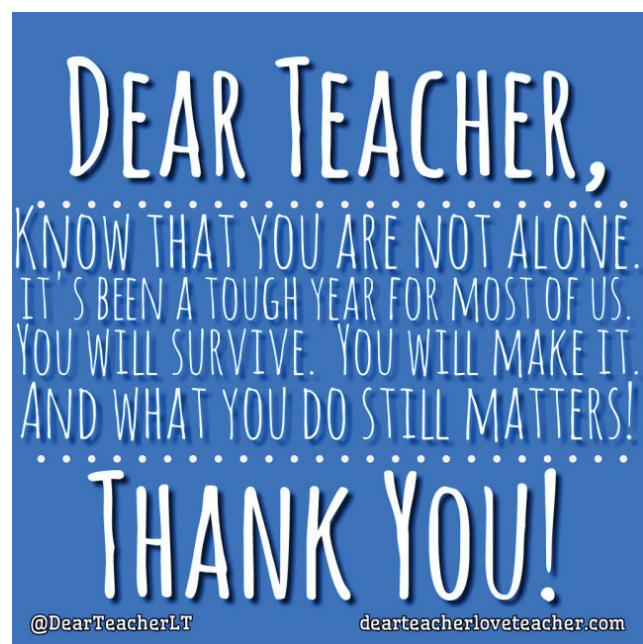
TOPIC 3 – LET'S GET STARTED

Session 1
Project-based Learning and the E³ Learning Model

1.1 What is Project-based Learning?

Project-based Learning (PBL) is a progressive approach which promotes individual and small-group learner involvement in solving real-life problems by developing rigorous research strategies. It's learning by *doing* and focuses on developing specific curriculum knowledge and skills while inspiring learners to question actively, think critically, and draw connections between their studies and the real world. Put differently, Project-based Learning is a *collaborative* – which refers to teamwork, learner-centred learning activity in which learners integrate *knowing* and *doing*. They apply what they know to solve REAL life problems and produce results that matter.

1.2 Why choose Project-based Learning?

In the first phase of learning about how learners acquire competencies, E³ decided that activity-based learning was critical and that Project-based Learning should be the vehicle for organising these activities. Project-based Learning is useful for various reasons.

• **Project-based Learning equips learners with 21st century skills.**
Solving highly complex problems requires that learners have essential skills - reading, writing and maths - and 21st century skills - teamwork, problem solving, research gathering, time management, analysis, and the ability to use high-tech tools.

• **Learning becomes more relevant and meaningful in PBL.**
Bringing the real world into the classroom provides a very powerful learning experience. A

teacher committed to the principles and passionate about the PBL approach will encourage learners to be critical and independent thinkers, and since the projects will mirror the real world, learners will see value and be more committed.

- ***Assessment is more meaningful in PBL as it is authentic.***

The assessment in PBL is more diverse and includes almost all forms of assessment - from the traditional test to observation of research practices. Authentic assessment also involves assessing learners' development while they work in pairs, groups or individually. This is less stressful for the learner and allows for repetition and another chance if the learner was not on point on a specific day.

- ***Project-based Learning accommodates diversity in the classroom.***

Globally, classrooms are becoming more diverse and teachers are faced with the challenge of trying to ensure that learners are all treated equitably. Group work ensures that teachers can customise tasks for individual learners and settle individual queries as they arise.

- ***Project-based Learning gives learners struggling with English (and any other LOLT)***

Above learners are provided with more options for speaking if the leader is empathetic and well-briefed.

A limited ability to communicate, in English particularly, is a key obstacle to many learners' academic success, especially from grade 4 onwards. If teachers group learners purposefully, they can ensure that each group has a strong and empathetic lead speaker from whom they can model conversation. Of course, the assumption here is that English is the LOLT (the language of Learning and teaching – if another language is the LOLT, a language-strong leader will perform the same leadership task). Thus, learners not comfortable in speaking English (or their LOLT) can do so in the low-risk group environment with peers who can help them.

- ***PBL supports group work and collaborative learning as a 21st century skill.***

Much learning is social and learners acquire many new skills from their peers in well-structured group work, especially if teachers organise groups intentionally for the outcome they wish to achieve.

- ***Research supports Project-based Learning.***

A growing body of international research supports the use of PBL. Schools where PBL is practised show a drop in absenteeism, an increase in co-operative learning skills and improvement in learner achievement. The marks actually improve. When technology is used to promote critical thinking and communication, these benefits are further strengthened.

- ***Projects are the formal assessment task in term 3 of the CAPS***

The projects are written to meet the CAPS requirements. Teachers can thus reach the curriculum outcome simply by changing their teaching method. The same information but packaged differently. Project-based Learning is not about the 'what' but the 'how'.

GO TO ACTIVITY 8 — THE EFFECTIVENESS OF E³

1.3 What is the difference between a project and Project-based Learning?

Traditionally, projects were a once-off poster or a flip file consolidating knowledge or content at the end of a chapter or a section of the syllabus. Thus, a project was a product. While Project-based Learning could also feature projects in the traditional sense, in PBL, the focus is more on the process of learning and learner/peer/content interaction than the end product itself. Thus Project-based Learning is not the dessert at the end of a chunk of information but rather a series of structured events that lead to authentic and impactful learning.

1.4 How does PBL work in the classroom?

According to the Buck Institute, learners engage in a project over an extended period of time - from a week up to a term or more - that engages them in solving a real-world problem or answering a complex question. They demonstrate their knowledge and skills by developing a public product or a presentation for a real audience at the end of the project. Importantly, this approach creates many opportunities for teachers to embed 21st century skills for learners to pick up in a real-life way. The educational focus in Project-based Learning is on both the learner and the curriculum. It is an approach through which learners develop drive, empathy, self-efficacy and 21st century skills like creativity, communication, critical thinking and collaboration. This type of learning is activated by experience, not learnt from a textbook. Because it is real, it has purpose for the learner and subsequently for the teacher.

Session 2
The E³ essential project design elements

2.1 Project design

Instead of teaching content, projects should be designed so that the activity allows learners to discover fundamental concepts and key learnings from school subjects and apply them to the real world. PBL helps learners practise these key learnings by using them to solve problems, answer complex questions, and create complex products.

To help teachers implement good projects, the Buck Institute created a set of criteria to be used as a checklist in Project-based Learning design. E³ began using the Buck Model in 2018 as it provided a good foundation to start from. Since 2018, E³ has been developing its own unique South African model of Project-based Learning.

2.2 How do we create successful projects?

To ensure an excellent PBL process, we need the following minimum requirements to be integrated in the project design (which we originally implemented as part of the Buck Design), but which has been adjusted for the South African teaching space:

- ***Challenging problem or question.***

This is a concrete or abstract problem which is real to the learners, in other words, the PBL is centred on a research-type cycle in which a problem is identified, research is undertaken, investigations are done and some or other solution is the result.

- ***Sustained enquiry.***

PBL is different from the projects we are accustomed to. Merely looking up information and summing it up is not enough. It is too shallow and does not demand active follow-up and testing that leads to deeper learning. Sustained enquiry takes time, is taken seriously, and teachers ensure that the activity is iterative, i.e., repeated until learning has taken place. The updated model places more weighting on the iterative element.

- ***Authenticity.***

Authenticity is critical if we are to keep learners involved. The project must be real and start with a genuine problem that the school or community needs to solve.

- ***Student voice and choice.***

If learners have a say in the selection of the project's problem, they work harder because they feel they own it. They also feel they are contributing to solving the world's problems.

- ***Reflection.***

Learners and teachers should be reflecting on various questions during the process. What is being learnt? Why is this learning important and how is this learning being presented? We do not learn from experience; we learn by reflecting on experience.

- ***Critique and revision.***

The outcome of good PBL is work of a very high standard, but this may not happen in the first cycle as teachers and learners grapple with typical challenges. How deep is a good project? How do we integrate the anchor subjects with other subjects? What are we learning? What can we do better?

- ***Public performance.***

The learners' solutions or projects are presented to as wide a public as possible for a few reasons. The work is generally of a higher standard if presented to a larger audience. Public products and performances are a way for learners and the school to communicate with all role players.

- ***Launching the project at school level is important for buy-in.***

Schools involved should announce the launch of all their projects at the start of term 3 or earlier, and also the culmination of the projects in a specified project week towards the end of term 3.

Each grade will manage its own launch. Example: a school competition where the winner is announced in a project week; an entrepreneurship quiz or an appropriate civvies day.

Be creative during project culmination week. All the products and solutions delivered by each grade's projects are up for public display. The broader the community involvement the better for the learners.

Schools will be encouraged to send YouTube videos of the best launch and other celebratory moments to be published on the E³ website and on the WhatsApp group. Enjoy yourself, it's great fun.

GO TO ACTIVITY 9 — BRAINSTORM IDEAS FOR THE LAUNCH

2.3 A uniquely South African PBL Model

As mentioned above, E³ has begun work on creating a uniquely South African model of Project-based Learning. Being iterative is really important to E³ and so we will be testing and developing this model over time to ensure that it is the best model for South Africa and makes the biggest impact on learner achievement.

Our model merges 3 important parts:

• Inquiry-based Learning

• Problem-based Learning

• Design-based Learning

Inquiry-based Learning

In the Inquiry phase, learners focus on investigating an open question or problem by practising their problem-solving skills. In the process, learners generate and answer their own more focused questions, and as a result develop their conceptual and procedural knowledge of a given topic. Teachers encourage learners to ask questions, scaffolding them through the investigation process and moving them beyond general curiosity into the realms of critical thinking and understanding.

Problem-based Learning

Learners work in teams to formulate real-world problems and propose possible solutions. Following a learner-centred approach, teachers scaffold the development of learners' ability to work collaboratively, be self-directed, and to think critically - promoting critical thinking skills, communication skills, and cooperation.

Design-based Learning

In the design phase, learners come up with solutions to complex problems by designing, building and testing prototypes that solve some of the problems they identified in the problem phase. The process requires learners to establish goals and constraints, generate ideas, and create prototypes through storyboarding or other practices.

See the image below for more information about what a South African Playful Project-based Learning project might look like.

GO TO ACTIVITY 10 — HOW CAN PBL START ADDRESSING THE ISSUES OF 4IR AND YOUTH UNEMPLOYMENT?
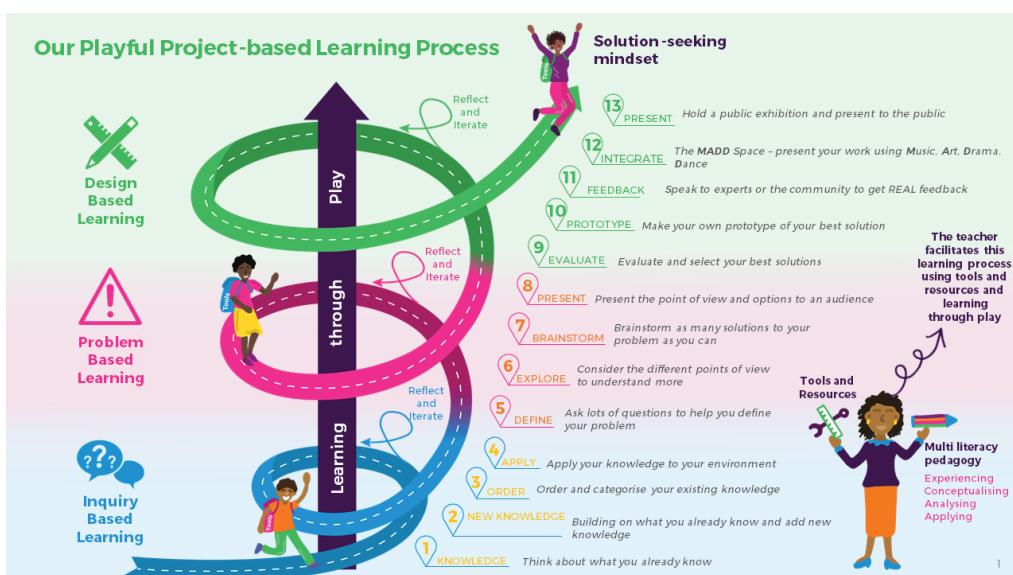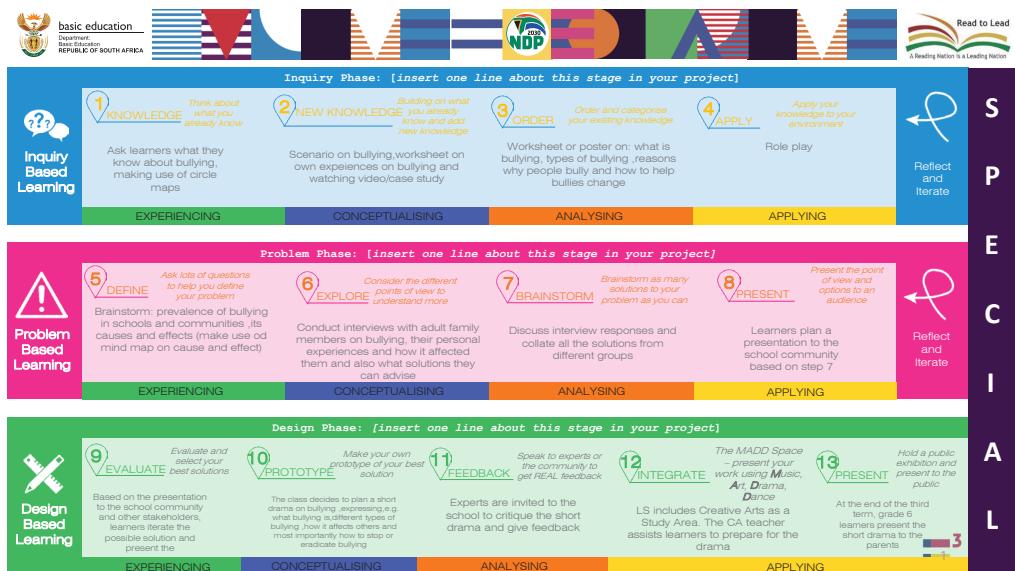
Session 3
My maths project

In this session we hear from an E³ teacher who implemented PBL in 2019 before the pandemic.

3.1 Getting started with my maths project

I am Michelle van den Nieuwenhof and I teach at Brebner Primary School in Bloemfontein. I started experimenting with Project-based Learning after I was introduced to it at the 2019 E³ conference. I realised that I had to make maths more realistic and alive in my class, as that was the only way the learners were going to start to achieve.

My first step was to find a real-life problem, which was quite a challenge. One day, I was attending a sale of repossessed vehicles when the idea came to me. So many vehicles get repossessed in our country, and I thought I should do a lesson on how to buy a car. This was amazing because 1) it was a real-life problem and 2) I was having more problems in my class with the boys - and as you know cars and boys - well, they were hooked immediately.

Once I had the real-life problem I needed to get permission from my principal. Thankfully, I have a principal who is really o,pen minded. I got halfway through my story and he said to me, "Michelle, you go for it. Just remember one thing, you have to make it successful because my neck is also on the line." We decided that I would just do it with my two classes, and the other grade 6 classes would carry on with the normal CAPS. The only condition was that we all had to write the same assessments. The next person I went to was my learning facilitator, who thankfully is also very open minded, and he also said to me, "You know what, go ahead. The only thing I would like is to see all your worksheets and your ideas and you need to just run it by me."- just so he could cover me if there was something that I wasn't doing properly or if there were any queries. So that is where I started.

3.2 Keeping learners motivated throughout

The next step was to make sure I covered all the design elements. So I used the design element logo that E³ gave us at our training. It was important that everything I did was

CAPS aligned, so all my academic planning and all my worksheets were CAPS aligned. I also had to make sure that I covered the design elements. So the first thing I did was pose a challenging problem or a question. Then I had to work out how to sustain inquiry. I decided to introduce a new aspect to buying a car regularly. The first thing I did was visit a car dealer with learners. There the learners got prices and they were all excited. As soon as their interest waned and they weren't quite as inquiring anymore, I introduced insurance, and then I introduced building a garage, and then I introduced fuel consumption. So to sustain inquiry, I kept on introducing new things or new points about buying a car.

For authenticity, it wasn't too difficult, because I chose a real-life problem, and buying a car is a reality to most people and none of our kids had ever been to car dealers or gone with their parents. So the fact that we visited a car dealer and the bank visited us just made it more authentic.

The next thing I had to look at was the students' voice and the students' choice. Well, here they had a voice because they could ask questions. Part of the project was to design questions to ask the car dealers or to ask the insurance or to ask the bank. My final part of the project gave them a lot of voice and a lot of choice. With buying the car, they also had to make a decision - I actually gave them pay slips and then they had to choose which car would suit their budget.

Reflection initially was a problem for me because I wasn't quite sure how I would get the learners to reflect on everything. I worked with the English teacher and we used English reports as part of the reflection for the project.

For critique and revision they had to give a report back.

The public product – well, here the one thing was that we had to report back on. We had a final evening where we invited the parents, the school governing body, the learning facilitator, the car dealership who helped us, and then the banks. So in the report back, there was a lot of public product involved and the learners could thank the companies. A lot of their creativity was exposed in the report back right at the end of the project. For public product, you need to use businesses around you. I used a local car dealer and a local bank. The local car dealer was really open to everything and made it very, very easy. The bank was happy to come and speak to the learners and also give them information about the insurance section of the project. Once I had gone through the whole design element circle, I saw that I had everything covered and I then just linked this to the CAPS.

3.3 Overcoming my challenges

Like with all new things, a person does experience various challenges and I really experienced quite a few. I think the biggest challenge for me was that I was the "lone wolf" on the staff. People thought I was really weird because I had these crazy ideas and it was difficult for me to keep my energy going because I didn't have much support initially. Later on it got better, but thankfully my principal backed me. The other challenge was that PB is noisy and it is messy and I'm quite strict in my class. My class is always relatively neat and the desks are all in a row. And my class was transformed into group work and suddenly there were a lot more papers because we were cutting out things, and it was noisy because we were discussing things. But I got used to that quite easily. The other problem was to start getting the learners to move from traditional talk-and-chalk and traditional teaching to a more dedicated or a more disciplined approach. The learners had to learn to be more disciplined and work, and so that initially was a problem, but towards the end of the project, I didn't even have a problem with that. The other problem, and this is an amazing challenge, I know when I say this you will think, "Oh no, how is this a challenge?" It was a challenge for me to get my learners to leave after maths. They were coming late for all the other classes because they just didn't want to leave the maths class. The classes I had before break used to sit the whole of break and argue and discuss the work. So it was a challenge but it was also a positive.

One of the things that surprised me about the project was, 1) that the learners really started enjoying maths and they didn't want to leave the maths class - that was really great. 2) the learners' marks improved. It was really interesting to note that the weakest learners marks

really, really improved. The middle, average learners also improved but, on the whole, the top learners didn't improve. Maybe they didn't improve because they had reached their ceiling, but I also found that a lot of the top learners really struggled socially. They struggled with the group work. It was frustrating for them that there were people who couldn't do some of the work and I think that it was a really important social experience for them. They had to learn that there are learners who find maths difficult. What was nice was that eventually they were helping the weaker learners, especially with a lot of the direct operations. I found that their direct operations really improved because the stronger learners in the group helped the weaker learners individually. One of the other things that surprised me was the creativity of the learners. I was actually shocked because we as teachers really stifle that creativity, because we are so syllabus bound. When I gave the learners the opportunity for creativity, initially they were a bit wary, but once they got going it was really amazing - it was amazing to see at the report back evening the creativity the learners came up with. I gave them freedom and I said to them, "You know what, this is the topic you have to report back on. But you can do just what you want to. You can decide to do a blog, you can decide to do an interview, you can do a play, you can do whatever you want to." And it was amazing what they came up with.

Another positive for me was that there was definitely a deeper understanding of maths and a deeper understanding for the need for maths. What was also great was the parental involvement. Right from the beginning, I involved the parents. I sent them little notes and little photos of everything and I was surprised with the parent involvement. And what was nice as well was the learners were going home and explaining all this to their parents and they would engage with their parents. So these were a few of the really positive things that came out of the PBL that we did.

3.4 Seeing real excitement

The PBL project caused a lot of excitement amongst the parents and amongst the learners, especially the young teachers that came on board. There were a lot of people saying, "can't we make this bigger?", and there was a lot of involvement from various stakeholders. So with all this excitement, we decided that we were going to start a Parents' Academy and the Parents' Academy would basically be where we engage the parents. We would get together two or three times a term and we would get a speaker speaking about real-life problems that the parents have. At our first engagement with the parents, we involved the Lego Foundation and we got an amazing lady to come and speak to the parents. The 6 bricks approach was followed and parents were shown how to work with the Lego to help their kids in all kinds of ways. From that, we then moved on and we asked the parents what they would be interested in. At our next engagement, we got an old learner from our school to speak about nutrition, we got a teacher to speak about routine, and then we also discussed sleep. And we did all this in one session. Then, to keep the parents going and to keep the momentum going, we started a newsletter. What happened is we had about 250 parents at our first meeting, which then grew to about 300 at our second meeting, and we wanted to engage even more people. So that is when we started with the newsletter. We sent all that out. Something else we planned (unfortunately because of Covid we couldn't go ahead with it) was an Earth Day PBL, and we started with the initiative to get that going. Unfortunately, we couldn't, but I'm sure we will be able to do it at a later stage. Another spinoff that emerged from the energy of the PBL was that everyone was more excited about everything and we could initiate a really nice World Read Aloud Day. We got all the learners to read to each other, for example, the grade 7s read to the grade 3s, the 6s to 2s, the 5s to 1s, and for the grade 4s, we had a different programme. There were many spinoffs from the excitement of the PBL.

3.5 Would I do it again - ABSOLUTELY!

All done and dusted, the question is, *would I do this again? Yes, definitely, definitely, definitely. Was it a lot of work? Yes it was! Was it hard? Yes it was.* But the spinoffs and the energy that came off this project was just worth so much. It created a great excitement towards learning. For the first time, learners were really positive about learning. They sometimes didn't even realise they were learning. They were discussing things young kids would never normally discuss. So for me, I would definitely do it again. The learners today need a different approach towards teaching and I think the most difficult challenge is the majority of teachers just don't realise that. We still teach how we were taught. Remember

the learners have changed completely. The learners today can go to Google, they can get the information they want immediately, but they still need to learn certain skills, and I feel that with the project, I gave them more skills, I equipped them with skills that they need in society. So yes, I definitely would do this again and I would encourage any teacher to really try this.

On reflection of the project, I think I need to question what would I have done differently, and what would I maybe keep the same. I think what I would have done differently is definitely go across the curriculum. When doing this project, I saw great opportunities to go across the curriculum. And especially in our country where a lot of our learners are not English-speaking learners and we teach in English, I think projects like this can improve the language. And I think PBL projects give the opportunity to incorporate English or Afrikaans or Sesotho into their projects and create a bigger academic language for the learners.

Another thing that I would advise any teacher to do is before you engage in a big project like I just did, rather introduce your learners to smaller PBL projects. Introduce them to the PBL way of teaching and use smaller projects to get them used to it so they can develop the skill and the discipline that they need for PBL.The other thing is that I definitely would have used PBL as part of my assessment. Obviously I couldn't because of the agreement I had with my principal - I still had to do traditional assessment. So I think that would have been a plus point - if I could have used the PBL as my assessment.

Another thing is I tried to engage all of the learners all of the time. No matter what method of teaching you use, you're not going to engage all the learners all of the time. You're always going to have disinterested learners. So I think when I do this again, I would definitely focus more on the interested learners. The disinterested learners took quite a bit of my energy and I think it's better to rather put my energy into the interested learners. I had a lot fewer disinterested learners, so that was a plus point. And yes, I think one of the big things I definitely would do different is I would worry less. I was so worried that this wasn't going to work. The learners were working and they were receptive to the change. What I would keep the same is definitely to continue with PBL. I would continue with group work. I would continue with the little bags that I had for each group. Each group had a specific coloured bag. This made the distribution of learning material easier. I would, however, make more mental changes. I would worry less. I would go across the curriculum and try not to want to engage all of the learners all of the time. That is what I definitely would have done differently.

Has this experience changed me as a professional teacher and as a person? Yes, definitely. One of the things that amazed me about myself in this project was it unlocked my creativity. I always thought I didn't have much creativity, but it just unlocked my creativity and now I just see projects popping up. I also had the opportunity to engage with a lot of stakeholders through this project. I worked closely with a local car dealer and also a local bank, and professionally, this also gave me confidence as a person and as a teacher, and it also made me realise that us as teachers really need to up our professionalism and we need to be proud of being teachers. Another thing that came out of this is lifelong learning. I'm doing a lot of studying regarding PBL. I'm even thinking of possibly going back to university and completing my Masters. So these are all things I experienced as a person and as a teacher. Another thing that was really pushed to the limit was my skill. Because I wanted to incorporate various things in the project, I had to up my skills. I had to up my IT skills, I had to up my presentation skills and I had to up my people skills. So that was really a very good outcome. And then lastly, the big thing that changed was I was a happy teacher, and happy teachers give you happy learners, which ultimately gives you happy parents. So the experience changed me as a professional, as a person, and it was a magnificent experience that I wish for every teacher.

GO TO ACTIVITY 11

REFLECTING ON MICHELLE'S PRESENTATION

Session 4
Assessment in Project-based Learning

In this session, we will look at the following; the goal of assessment, the importance of product versus process, peer assessment, self-assessment, and the integration of various subjects to form one deep assessment.

4.1 The goal of the assessment

Ensure you know what the goal of the assessment is:
·   Baseline – where are we before we start? Where do we need help?
·   Formative – how are we doing after each small step?
·   Summative – how did it go after a large chunk of work was completed?
Also: reflect on whether you are assessing the process or the product.

4.2 Product versus Process

Assessing the product	Assessing the process
Measuring the quantity and quality of individual work in a group project.	Evaluating individual teamwork skills and interaction.

Another important consideration when assessing is to reflect on whether you are assessing the process or the product. Often we try to assess too many aspects, both product and process at the same time, and very often just the product and the assessment becomes messy and unfair. Assessing process is key to Project-based Learning. We all understand the assessment of products, for example, a test, a poster project, a homework assignment. These are second nature to us when assessing. We have been trained to collect marks and often the 21st century skills get left behind. Knowledge and curriculum coverage is not negotiable. We all agree on that. But a 21st century teacher will pay attention, special attention, to how learners are learning.

4.3 Group work

Group work is an excellent opportunity to measure the quantity of work and the quality of individual work in a group project. An engaged teacher will use the time when learners are working in groups to make notes on individual teamwork skills and how individual learners interact with others. These are the competencies we need to spend more time on developing. These are the processes we need to be observing.

4.4 Peer Assessment

Learners should be given the opportunity to assess each other's contributions. Consider providing a rubric to foster consistent peer evaluations of participation, quality and quantity of work. Good and solid peer assessment is very powerful and may reveal participation issues that the teacher might not even know about. Learners who know that their peers will evaluate their efforts may contribute more to the group and have a greater stake in the project. Ensure that the rubric you create is easy to understand and fair. Even better, create the rubric with inputs from the class. This is real learning.

4.5 Self-assessment

Give learners opportunities to evaluate their own performance. Help learners reflect on what they have learnt and how they have learnt it. Consider asking learners to complete a short survey that focuses on their individual contributions to the group, how the group interacted together, and what the individual learner learnt from the project.

4.6 Integrate assessment throughout the process

Ensure that groups know how each member is doing by integrating assessment throughout the project: baseline assessment at the beginning to ascertain what they knew before they started. Groups need to know who may be struggling to complete assignments, and members need to know they cannot sit back and let others do all the work.

4.7 Assign specific roles in group work

The roles most often needed for group work include:
a.   Facilitator / Team Leader
b.   Recorder
c.   Presenter
d.   Timekeeper
e.   Artist / Illustrator
f.   Wild card (assumes any role if another role-player is absent)
g.   Human Resources (keeps the peace)
h.   Resource manager (ensures that all members have all the tools and resources they need to complete the project.)

When you first introduce roles, provide clear instructions for the responsibilities that come with each project. Filling out a rubric for each member of the group can help teachers assess individual contributions to the group and the individual's role as a team player. Here is an example of a group work assessment rubric.

Example of a Group Work Assessment Rubric				
Skills	Advanced - exceeds expectations	Competent - meets expectations	Progressing - does not fully meet expectations	Beginning - does not meet expectations
Contributions & Attitude	Always cooperative. Routinely offers useful ideas. Always displays positive attitude.	Usually cooperative. Usually offers useful ideas. Generally displays positive attitude.	Sometimes cooperative. Sometimes offers useful ideas. Rarely displays positive attitude.	Seldom cooperative. Rarely offers useful ideas. Is disruptive.
Cooperation with Others	Did more than others. Highly productive. Works extremely well with others.	Did own part of workload. Cooperative. Works well with others.	Could have shared more of the workload. Has difficulty. Requires structure, directions, and leadership.	Did not do any work. Does not contribute. Does not work well with others.

Focus, Commitment	Tries to keep people working together. Almost always focused on the task. Is very self-directed.	Does not cause problems in the group. Focuses on the task most of the time. Can count on this person.	Sometimes focuses on the task. Not always a good team member. Must be prodded and reminded to keep on task.	Often is not a good team member. Does not focus on the task. Lets others do the work.
Team Role Fulfilment	Participates in all group meetings. Assumes leadership role. Does the work that is assigned by the group.	Participates in most group meetings. Provides leadership when asked. Does most of the work assigned by the group.	Participates in some group meetings. Provides some leadership. Does some of the work assigned by the group.	Participates in few or no group meetings. Provides no leadership. Does little or no work assigned by the group.
Ability to Communicate	Always listens to, shares with, and supports the efforts of others. Provides effective feedback. Relays a lot of relevant information.	Usually listens to, shares with, and supports the efforts of others. Sometimes talks too much. Provides some effective feedback. Relays some basic information that relates to the topic.	Often listens to, shares with, and supports the efforts of others. Usually does most of the talking. Rarely listens to others. Provides little feedback. Relays very little information that relates to the topic.	Rarely listens to, shares with, or supports the efforts of others. Is always talking and never listens to others. Provides no feedback. Does not relay any information to teammates.
Accuracy	Work is complete, well-organized, error-free, and done on time or early.	Work is generally complete, meets the requirements of the task, and is mostly done on time.	Work tends to be disorderly, incomplete, inaccurate, and is usually late.	Work is generally sloppy and incomplete, contains excessive errors, and is mostly late.
TOTAL MARKS (24)	COMMENTS/FEEDBACK:			

Assessment in PBL is generally continuous and formative, but in the projects in this programme, we are fortunate in that the formal assessments for Term 3 in Grades 4 – 6 Life Skills, Grades 7 – 9 EMS and Grades 10 – 12 Life Orientation are the "project" for assessment. Teachers will have the rubrics they usually use for assessment of the projects in their grades. They are found in the actual project notes.

Also, we are hoping that the Life Skills, EMS and Life Orientation teachers will ask other teachers to assist with assessment wherever there is a gain for these teachers as well. We have suggested subjects with which there is possible integration with other subjects.

In conclusion, assessment is a key driver of good Project-based Learning, but each assessment, be it peer, individual or group, should have a purpose - ultimately to consistently develop learners who are well equipped for the new world after school. This can only be achieved if the process of learning is respected. Product important, process critical!

Session 5
Supporting deep learning within Project-based Learning

5.1 Diversity and scaffolding

Diversity
In South Africa, the curriculum and education system as a whole still face huge challenges in responding, in an adequate way, to the diverse needs of the learner population. Overcoming these challenges will contribute to the reduction of the massive numbers of drop-outs, push-outs and failures (White Paper 6, pg 8).

White Paper 6 (DBE, 2001) is the policy framework that directs the building of a single, inclusive system of education and training, built on the principles of human rights and social justice for all learners. The policy framework states that the education and training system should promote education for all and foster the development of inclusive and supportive centres of learning that would enable all learners to participate actively in the education process so that they can develop and extend their potential and participate as equal members of society.

The South African Constitution (Act 208 of 1996) ensures the fundamental right to basic education for all South Africans. Section 29 states that "everyone has the right to a basic education". This requires the development of a system that accommodates and respects diversity, including departmental, institutional, instructional and curriculum transformation. In order to develop such a system, it is important that all teachers develop knowledge and skills to enable them to enact inclusive practice in the classroom.

Part of our responsibility as teachers is to make sure we think of ways to enhance our inclusive practice to ensure all learners in our classes are learning.

Scaffolding
A core component of supporting learning by all is to provide effective scaffolding when required by learners. The term "scaffolding" is a metaphor taken from the building industry – where a scaffold is a temporary structure that is taken away when the building can stand alone (English, ESL and more 2006).

Scaffolding must begin from what is near to the learner's experience and build to what is further from their experience, i.e., moving from the known to the unknown. Vygotskian theory shows that learning starts from the concrete and moves through the representational to the abstract (Woolfolk, 1998). Scaffolding starts with a learner getting a lot of support while they tackle a task, to teachers slowly removing support as the learner masters the task and can cope independently.

How to scaffold: differentiated Instruction for Project-based Learning
A good way to start differentiated instruction is by recognising that every learner is worthy of individual attention and that you should adjust, as far as possible, to accommodate individual needs by scaffolding to support each learner.

Consider the following steps when planning your differentiated approach to teaching.

Step 1: There are different approaches in lesson delivery
In Project-based Learning, learners have many chances to understand the content, so capitalise on the opportunity to get to know learners individually. Before you start planning a PBL cycle, have a goal in mind:

What is Differentiation?
Know the Learner
Assess the Learner
Adjustable Assignments
Questioning Strategies
Curriculum Approaches
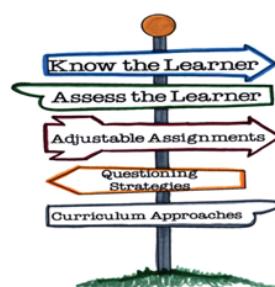
- What skills do you want them to practise?
- What do you want them to show in the end?

Plan questions for ''low'' and ''high'' learners before you start Project-based Learning.
Here are some easy things to incorporate into PBL to deliver your lesson in different ways:

- Videos
- Reading selections
- Writing assignments
- Building a 3D model
- Discussion

Step 2: Different learning styles
One of the essential elements of PBL is student choice and voice. Not only do learners have a choice in how to show what they've learnt in the project they turn in, but they also have several choices throughout the project.

Everyone must do a Project in Life Skills, but it can be done with the strategies and tools that work for the individual student.

PBL gives learners a chance to learn through technology, text, art, multimedia, and much more.

Step 3: Grouping to differentiate
During PBL, strategically shuffle groups around often. Not only does it keep it fresh and new for learners, but it allows for the teacher to implement differentiated instruction through grouping.

- Different groups to try in your classroom:
- Create similar groups and pool a small group of struggling learners.
- Group mixed groups.
- Group learners by interests.
- There are a lot of choices during PBL, so get some learners together that make the same choice!
- Try groups of 2, 3, or 4 people.
- Try partnerships of 1 boy and 1 girl.
- Allow time for learners to work independently but provide a space if they want to work in a "whisper group".
- Give group members roles based on their talents and affinities.

Step 4: Using a rubric to differentiate
Create rubrics for each PBL activity and give them to learners before you even start the activity so that they know what you expect to see by the end of their project.

Step 5: Enrichment for advanced learners
Create extra challenging activities as part of differentiation. Challenging advanced learners is equally important as helping those who struggle. Build varying challenges into your Project-based Learning because it allows you to differentiate for those learners without having to do anything extra during the actual activity.

5.2 Every teacher is a language teacher

In the South African context, you are likely to find many learners in your classroom being taught in a language that is not their home language. This means that it is every teacher's responsibility to support the language development of learners regardless of whether you are a language teacher or not. Teachers of every subject need to understand that the learners' ability to access subject content is enabled or limited by their language proficiency.

Teachers play a critical role in supporting language development. Beyond teaching children to read and write in school, we need to help children learn and use the academic language related to the various school subjects. We need to help them become more aware of how language functions in various modes of communication across the curriculum. As teachers, we need to understand how language works well enough to select materials that will help expand our learner's language competencies and to plan instructional activities that give learners opportunities to use the new language they have learnt.

Teachers need to understand how to design the classroom language environment so as to optimise language and literacy learning and to avoid linguistic obstacles to content area learning (Wong, Fillmore & Snow, 2000, p. 7).

Teachers need to have a basic understanding of the order of language acquisition and how to support each stage. Research has identified stages of language acquisition. Every teacher should be aware of what these are and know some simple strategies for supporting learners in each of these stages. The table below unpacks signs of each stage. This will help you better understand and assist struggling learners.

Language Acquisition Stage	Description of stage	General Support Strategies
Pre-Production	Silent period. Absorbing, not speaking.	Emphasise listening. Use visuals. Speak slowly, shorter words, gesture.
Early Production	Learner uses short words and sentences but is still doing more listening than speaking.	Develop new vocabulary. Use visuals. Pair work.
Speech Emergent	Speech more frequent, words and sentences are longer. Context clues. Vocabulary begins to increase.	More academic vocabulary. Use visuals and make connections with learners' background knowledge as much as possible.
Beginning Fluency	Speech is fairly fluent in social situations with minimal errors. Academic language is challenging.	Work in pairs and groups to discuss content and process the new language. Ask critical questions. Model academic language. Visual support and vocabulary.
Intermediate Fluency	Commenting in the social language is fluent, and is beginning to offer opinion or analyse a problem.	Identify and model key academic vocabulary and phrases. More academic skills, brainstorming, prioritising, category summarising, compare and contrast.
Advanced Fluency	Fluent communication in all contexts. Comfortable when exposed to new academic information.	Continue with visual support, building on background knowledge, pre-teaching vocabulary and making connections between content areas. Offer challenging activities to expand vocabulary.

A learner with poor language ability in the LOLT may be misunderstood as "slow" or uninterested. It is critical that teachers recognise that learners who are not engaged or participating in class may be experiencing a language barrier or maybe they just need more time. A basic understanding of language acquisition would help teachers understand that

if, for example, a new language learner is ''silent''; this is not because s/he is ''slow'', but because s/he is absorbing and listening deeply. (I.e., s/he is in the Pre-production Period of Silence and this is normal and actually an extremely important stage.)

GO TO ACTIVITY 12 — **SPINNING A YARN**

Session 6
Supporting deeper learning in PBL - Classroom Management and group work

6.1 Group work and assessment of group work

Project-based Learning can demand different and often unpractised skills from more traditional teachers. Teachers need to try to create conditions in the classroom for PBL to thrive. This requires classroom management strategies and positive behaviour management techniques that allow for a learner-centred classroom.

Classroom management strategies need to support collaboration and a productive group work environment. This requires careful planning and defined roles for each member of the group. Opportunities should be created for individual tasks, group work and reflection. How do we manage our classrooms during PBL? Here are some considerations to assist you in managing your classroom:

1: Keep learners busy
If learners are engaged, they are less likely to misbehave. Use Project-based Learning activities that have printable guides and sheets to help learners organise their work, and have easy access to "Just-in-time" information either from textbooks, the internet or printed out information sheets which you can later collate and use to form a generic toolkit. Textbooks take on a different role in PBL: they are useful for research and no longer drive the lesson.

Take the time to plan each day of your PBL with a fresh activity that will have learners asking many questions, because this is the beginning of critical thinking. Each day should have a specific task or topic, but different learners might be working towards it in a different fashion - probably very different from your own strategy. Allow them the freedom to explore different ways of solving a problem.

DID YOU KNOW?

"In an effective classroom, students should not only know what they are doing. They should also know why and how." Harry Wong

2: Teacher involvement is critical
In the past, some teachers have used projects as a chance to let the learners "get on with it on their own" and would be unavailable to learners. This is not Project-based Learning! In PBL, teachers take on the role of facilitator. Take the time during PBL to walk around and talk to your individual learners. Because everyone is very busy, this is an excellent opportunity for one-on-one conversations with the learners in your class, especially those

who shy away from attention.

Don't wait for the "usual suspects" to raise their hand and ask for help. Engage each learner in discussion and ask them questions about the topic. Groups are a safe space for shy learners to find their voice. This allows you to build relationships with your learners and let them know that you're nearby and paying attention to what they're doing.

3: Engage struggling learners by selecting suitable tasks which will empower them.
Target the learners that you know struggle in class. Diversify the activities so that every learner is working on something s/he is good at!

Plan out the questions you'll ask these learners and be prepared to listen to what they have to say. Don't be afraid of silences. Learners sometimes take time to formulate their answers. Give them space and do not give in to the need to fill the silence with your own words. Let them take responsibility for filling that space.

4: Have a variety of topics for learners to explore
During Project-based Learning, we want learners to ask questions and dive deeper into the topic. If possible, have computers, books and other media available so that no learner has ever really completed the task. Expect more from learners. They should be working against time. This will force the group leader or timekeeper to manage time, encourage creativity and result in high productivity. If learners are really "into" a topic, they won't stop engaging. They will look for more information on their own. This is a part of learning that needs to be instilled in learners because they aren't always allowed the freedom to explore a topic.

5: Universal classroom management strategies
·   Model ideal behaviour.
·   Let learners help establish guidelines.
·   Document rules and consequences.
·   Avoid punishing the class.
·   Encourage initiative.
·   Offer praise – catch the positive.
·   Use non-verbal communication.

These are links to online resources about classroom management.

https://performingineducation.com/classroom-management-and-project-based-learning
20 Classroom Management Strategies | Prodigywww.prodigygame.com › blog › classroom-management-strategies/

6.2 Group work and assessment of group work

Collaboration is meaningful for different types of learning. Incorporating collaborative Project-based Learning during class time is an excellent way to help learners develop and practise problem-solving skills as well as teamwork and collaboration.

Collaborative learning refers to learning in and through groups by interaction and dialogue. Mirroring one's own beliefs and ideas is a process that creates inter-subjective and meaningful knowledge. Collaborative learning enables you to negotiate and create new meaning. It is part of our active engagement in the world and is shaped by our dynamic relations with the world.

Learning in Project-based Learning is fundamentally a social process that involves participation in group learning. This collaborative work in the group can be the most rewarding and productive part of learning, as people work together and help each other to understand what was uncovered in research and how it can be applied to the problem presented. This applies to teachers and learners. Collaboration allows you to develop the

security and authority needed for taking responsibility for your own learning and is an essential skill you need in your career as you will be invariably working as a team member.

Step 1: Purpose
- Think carefully about how learners will be physically arranged in groups. Think about how the layout of your classroom will impact the class activity. Will learners be able to hear one another clearly? How can you moderate the activity to control volume?
- Insist on socially appropriate conduct between and among learners to respect people's differences and create an inclusive environment.
- Share your rationale for using group work. Learners must understand the benefits of collaborative learning.
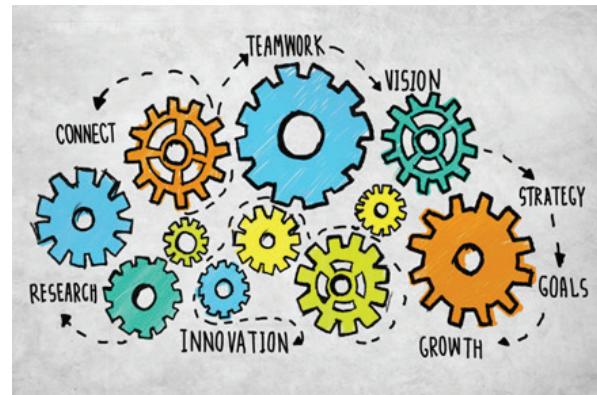
Step 2: Introducing the group activity
- Decide on group size. The size you choose will depend on the number of learners, the size of the classroom, the variety of voices needed within a group, and the task assigned.
- Decide how you will divide learners into groups. Randomly assign learners to groups by counting off and grouping them according to a number. Another idea is to hand out coloured cards and group learners according to the colours they choose.
- Allow enough time for group work. Recognise that you won't be able to cover as much material as you could if you lectured for the whole class period. Cut back on the content you want to present in order to give groups time to work.
- Have learners form groups before you give them instructions.
- Explain the task clearly. This means both telling learners exactly what they must do and describing what the final product of their group work will look like.
- Set ground rules for group interaction. Especially for extended periods of group work, establish how group members should interact with one another, including principles such as respect, active listening, and methods for decision making.
- Encourage the learners to ask questions. Even if you believe your instructions are crystal clear, learners may have legitimate questions about the activity. Give them time to ask questions before they get to work.

Step 3: Monitoring the group task

- Monitor the groups but do not hang around. As learners do their work, circulate among the groups and answer any questions raised. Facilitate more than teach.

- Avoid interfering with group functioning. Allow time for learners to solve their own problems before you get involved.

- Be slow to share what you know. If necessary, clarify your instructions, but let learners struggle - within reason - to accomplish the task.

Step 4: Ending the group task

Provide closure to the group activities. Learners tend to want to see how their work in small groups was useful to them and/or contributed to the development of the topic.

Oral reports: Have each group give one idea and rotate through the groups until no new ideas arise.

Written reports: Have each group record their ideas and either present them yourself or have a group member do so. One variation on this is to have groups record their conclusions on a section of the blackboard or on flipchart paper that is then posted on the wall.

To conclude session 6, successful PBL depends, in part, on confident classroom management – especially the ability to structure and manage groups. Group work is not simply a rearrangement of desks, it is much deeper. Group work should be about collaboration and participation of all learners as they focus on accomplishing a task. As learners actively work together, they engage with information and concepts far more deeply than if they were merely sitting and listening to you talk. Group work is also one of the best strategies to stimulate 21st century competencies such as connection and thinking.

Group work and all that goes with it can be a huge shift, especially if straight lines and quiet classes are the norm in a school. Learning to structure and manage groups and plan effective group work tasks is a process, it will take time and there will probably be some bad days as you and the learners adjust to all the newness. But please continue to try, because eventually you will see such huge and positive results in your learners that you will never go back.

GO TO ACTIVITY

SUMMATIVE ACTIVITY TOPIC 3
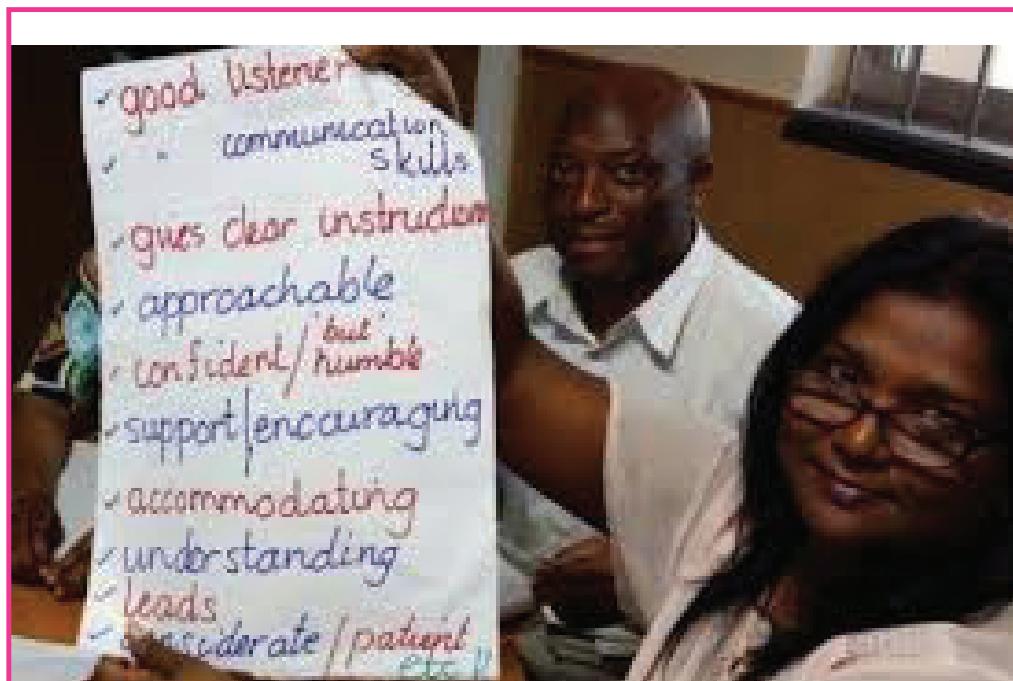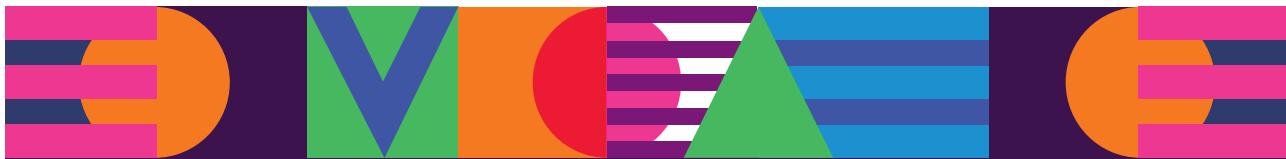
TOPIC 4 – THE PBL LEARNER AND THE PBL TEACHER

Session 1
A learner-centred approach

1.1 What kind of learner is envisaged

We have discussed the entrepreneurial, search and discovery and, solution-seeking mindset that is critical for success in our changing world. Although not all learners will become entrepreneurs, we should think of them all as ''entrepreneurials'' - a generation of young people with an opportunity-seeking mindset that drives their abilities, actions and purpose in helping others.

In order for an education system (starting at school) to develop these learners, every element of the E³ approach must be unlocked. This includes the E³ mindset (self-efficacy, a growth mindset, resilience, an internal locus of control and intrinsic motivation) and 21st century skills (foundational literacies, competencies and character qualities, rooted in life-long learning).

The diagram below, designed by Fadl of the CCR, unpacks the unique qualities needed by 21st century learners in order to thrive in a changing world.

Knowledge
"What we know and understand"

Interdisciplinarity
Traditional (i.e., Mathematics)
Modern (i.e., Entrepreneurship)
Themes (i.e., Global Literacy)

21st Century Education

Skills
"How we use what we know"

Creativity
Critical Thinking
Communication
Collaboration

Character
"How we behave and engage in the world"

Mindfulness
Curiosity
Courage
Resilience
Ethics
Leadership

Meta-Learning
"How we reflect and adapt"

Metacognition
Growth Mindset

GO TO ACTIVITY 13 — GENERATIONAL GAPS

E³ has synthesised all of the attributes of Fadl's model on the previous page as well as other key features identified as success factors in the 21st century in a learning model which includes the process (circle) towards achieving the E³ competencies, character, thinking and connection.

Our learners are different, which means it's time for a major overhaul of the way in which

The E³ learning model

Fosters purpose-driven learning, mindset and competency development every day in every classroom.

Character: citizenship, curiosity, resilience

Thinking: creativity, critical thinking, reasoning

Connection: collaboration, communication, empathy

INSPIRATION — Making the learning journey worthwhile

TOOLS & IMPLEMENTATION — Providing engaging and varied pedagogies towards life-long learning by doing (eg. PBL)

COMPETENCIES — Globally acknowledged Fit for the 21st Century and the 4th Industrial Revolution workplace

CAPS — Curriculum and Assessment Policy Statements (currently content-focussed)

MINDSET CHANGE — Develop entrepreneurial mindset, agency and self-efficacy

REFLECTION — Creating the opportunity and developing the ability to pause and think about learning

Develop **teacher agency** to ALSO **assess competencies** in school-based assessment

Diverse modes of assessment (e.g. peer group/self-assessment)

Assessment: **of learning** *as and for learning*

basic education — Department: Basic Education — REPUBLIC OF SOUTH AFRICA

we teach. Knowledge transmitted from a textbook to a passive learner can no longer deliver good results – our learners are millennials who need to be actively engaged to thrive, and we owe them all the strategies we can offer them to flourish in a vastly different world.

Session 2
Generation Z (GenZ)

The learners in our classrooms are mainly Generation Z (people born from the mid-1990s to the early 2000s). Their mindsets are very different from our own. In a sense, both young teachers (Generation Y) and their learners (Generation Z) are already "entreprenerials". Even though they will not necessarily start their own businesses, they share a common mindset.

Let us focus on the needs of this generation so that we can understand their learning preferences. Our learners are Generation Z and we need to find a language that communicates the best with them.

2.1 What are the characteristics of GenZs?

Teachers often complain about the lack of discipline in their classes and their learners'

fascination with their cell phones and subsequent loss of interest in the lesson. Younger teachers have greater tolerance for their learners' attitudes and learning styles, but without a definite plan to engage their GenZ learners, classroom time will not be productive. By focusing on the needs of Generation Z, it will become clear that a whole new approach and a break from chalk-and-talk teaching is the most efficient way to engage the learners in our classrooms.

The learners of today have certain characteristics that make them unique and there are things that excite them.
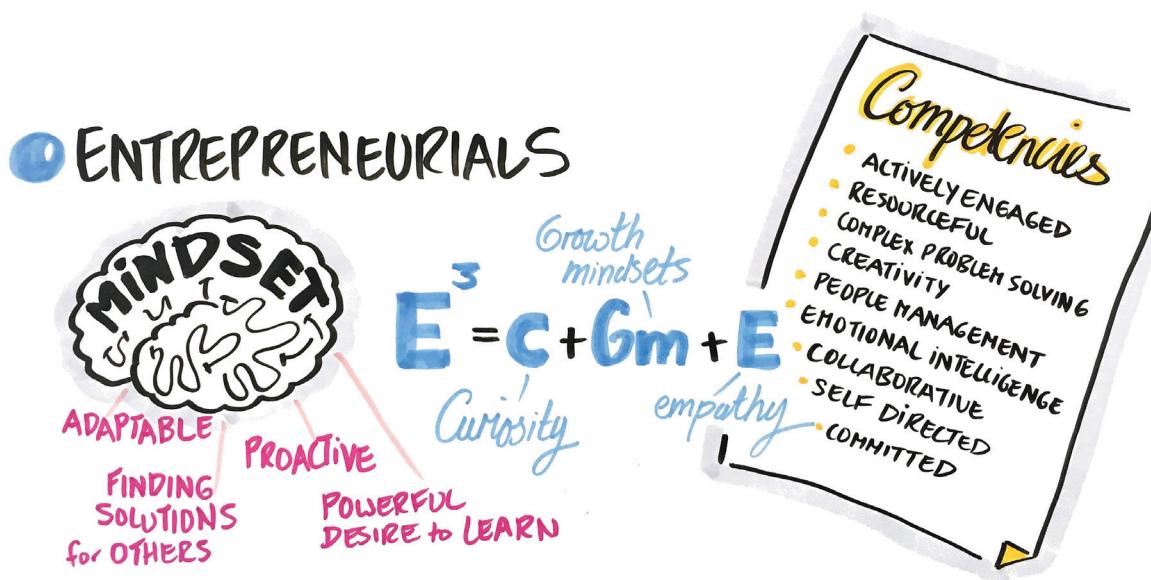
Technology
Of course they are technologically inclined! GenZs are known as neo-digital natives. The rest of us are technology immigrants! They cannot imagine a world without technology – and are not awestruck or intimidated by it.

GenZs don't use technology for the sake of using it. For them, it is simply a way to get what they want, be it information, entertainment or connection. Technology immigrant (BBTs – Born Before Technology) found friends on the playground; GenZs find them on social media sites. BBTs used libraries; GenZs use google. BBTs went shopping; GenZs shop online.

There are many, many differences between the generations that all highlight the fact that there is a poor fit between GenZs and traditional teaching. It is not possible or fair to reshape GEnZs to fit an outdated educational system. What we need is to shift education so that it 'fits' and meets the needs of these young people.

Multi-tasking
GenZs know no other way. On the day that they were born, they were probably filmed and pictures and announcements were sent around the world at the press of a button. This is how they were welcomed into the world. Whether multi-tasking is productive, which is another topic altogether, the point is, this is how they operate: watching TV with headphones, jamming their favourite songs, texting a friend, and telling you how their day went - all at the same time. Life happens quickly.

What they do should matter

Their parents tell them that they can become whatever they choose to – and they choose to do things that matter.

GenZs are often criticised for having a close-to-zero attention span, but if they are passionate about something, they can focus on it for hours. Take for example, video games - boredom is not a result of lack of attention; it is a lack of passion. If they understand the value of what they are doing, chances are they will see it through. But don't think that you can con them into "value". They are very perceptive and anything that smells of "plastic" or is fake is a certain no-go zone. They want authentic, they want real, and they want it now. It is no use telling them that they will reap the rewards of what they are doing now sometime in the future. They need to know upfront, otherwise they simply won't commit. Generation Z is passionate about a real and authentic experience.

Opinion is important

GenZs' opinion is important. The modern learner wants and needs to be heard and their opinions matter. This goes two ways. Firstly, they want to be heard. They were not brought up with the motto - "children should be seen and not be heard" – they were encouraged to be seen AND heard. Their parents engaged them in discussion about almost everything; they were expected to express themselves. Hence the constant blogging, vlogging, uploading, updating and saying. They believe that their opinion matters and will be heard. They are master negotiators – they've been trained that way since birth. Secondly, since they get immediate feedback at home, they want it everywhere. Not many things are quite as devastating as being ignored or brushed off. They need to be heard and acknowledged. Furthermore, they are especially sensitive to the opinions of their peers.

Please note
Cultural environment does play a role, however. With many young South Africans growing up with their grandmothers or non-literate parents, this may not be true in many, particularly rural, families.

Work and play – in the same day

Work and play is inseparable for the modern learner. Learners learn through play, and it is critical that we structure our teaching around this fact. Also, they may have watched their parents slaving away to give them everything they want, and they are silently rebelling against the institution of working your life away. They have tasted a fun-loving life, and they want to live it.

GenY are known for having big dreams and aspirations and making them happen - provided they are passionate about them, they are meaningful, and they can accomplish them in a playful way. Generation Z, however, is a little more cynical, and more cautious. They were born during a time of financial recession, a boom in violence and terrorism, and they live in a world that has never felt safe. Unlike previous generations, who have strong opinions about issues like sexuality and diversity, GenZs are more accepting of people who are different. Since they were born, multitudes of people have migrated from their home countries and there is no country that remains homogeneous. The result is multi-cultural classrooms where learners are exposed to 'foreignness' daily.

Please note
In South Africa, GenZs are a little more serious as they are often the first generation to go on to tertiary education and the sacrifices of their parents and the extended family can be heavy burdens to carry.

Generation "Why not?"

By no fault of their own, GenZ is not used to the word "no", simply because they have not heard it that much growing up. This is the 'why not?' generation. The modern learner thinks critically and always questions. They want to negotiate and are willing to compromise. Their parents were unlikely to deprive them in the same way they were denied. And whenever "no" was imperative, it was softened with an alternative. They could not have ice-cream, but what about frozen yoghurt? These were also the children who got spared punishment, and served time-out instead – somewhere on a designated chair or in their rooms. Punishment does not serve them well.

DID YOU KNOW?

Boomers are people born between 1946 and 1964. Comically referred to as "helicopter" parents, they can be overprotective and take an excessive interest in the life of their children

Up tempo – quick, quick, quick!

GenZs are racing cars, so to speak. They are used to instant, online everything. They want things to happen quickly, they multi-task and their lives happen quickly, thus their learning needs to be up tempo as well.

Structure and instruction

This may seem like a contradiction – coming from a generation which seems to break all the previous generation's rules, but they were often raised by helicopter parents and thus are used to, and even enjoy, some structure.

A world in pictures

These "screenagers" as GenZs are sometimes called, are naturally more comfortable in image-rich environments. They love pictures, whether posting selfies on the 'gram or learning through pictures, the visual aspect of learning is imperative for this generation.

Just do it!

GenZ is the 'just do it' generation. The modern learner is hands-on – they want to participate and not just observe. They prefer to try stuff by themselves – to explore the world and their environment on their own. They are actively involved in whatever happens on the screen in front of them. This is why play-/activity-based learning engages them.

Social connection and team players

Last but by no means least, is social connection. Generation Z needs to collaborate. They do not alienate themselves with technology, but it is actually how they connect. It is not uncommon for two friends sitting next to each other to communicate via texting. That is simply another way they connect. GenZs seamlessly move between physical and virtual interaction and are much more positive about being team players than operating in isolation. They are also much more inclusive than generations before them, as well as more comfortable and more accepting of diversity. This is the generation for whom gay culture and xenophobia are almost not an issue. They are very tolerant of "different-ness". Their interaction, if data is available, is likely to be mostly virtual and their social circle smaller and more cohesive ("tighter"). They have a strong sense of identity and will even create a virtual image or personal brand to use in virtual communication. How do we equip ourselves for these learners in our classrooms? We have to do things differently – chalk-and-talk is no longer relevant as the only way!

2.2 Why PPBL is perfect for GenZ learners

Project-based Learning is the pedagogy driving the E³ programme. GenZs respond very well to Project-based Learning because it ticks many of their satisfaction boxes. In the last section, we discussed the characteristics that are unique to the modern, GenZ learner, and in this section, you will find out how seamlessly Project-based Learning links with these characteristics.

Technology: They are ready for the Fourth Industrial Revolution and they are already semi-geared for the new world of work, which means that they will be more likely to find work. Project-based Learning is a natural learning space for research, and 21st century research is linked to technology.

Multi-tasking: The ability to move from one discipline to another and to integrate tasks is key if learners want to flourish in the modern economy. Because Project-based Learning is a series of integrated activities, learners practice multi-tasking in an authentic way.

The learning should matter: A Project-based Learning activity is driven by a challenging problem or an important community question, one that has meaning to the learner.

Their opinion matters: This is the 'why not' generation. One of the key outcomes of project-based learning is the promotion of critical thinking. GenZs fit into the project-based learning base naturally.

Work and play all in the same day: Project-based Learning is activity based. Learners are involved in purposeful play as they learn and this is exactly what this generation wants.

Up tempo: Project-based Learning moves at a pace that is directed by the learners. They determine their own tempo to their own satisfaction.

Structure and instruction: Despite being an organic process, good Project-based Learning is highly structured, which is exactly what GenZs need - structured creativity.

A world in pictures: Project-based Learning introduces various learning styles as groups try to solve a real-life problem. Visual learning, especially via YouTube and using Google, is a key tool.

This is the 'just do it' generation: Project-based Learning expects intuitive action as solutions to challenging problems are being found. Often instinctive trial and error are the beginnings of solutions to complex problems.

Social connection and team players: Group work and collaboration is integral to Project-based Learning and for developing 21st century skills. This is exactly how GenZs thrive, by communicating and connecting - and this is not necessarily done face-to-face.

Project-based Learning is the approach driving the E³ programme. Project-based Learning allows GenZs to thrive and learn in a way that not only challenges them but allows them to develop the skills needed for the changing world of work.

Session 3
The 21st century teacher

Many teachers are readier than ever to move to more authentic, results-driven, active learning approaches because they know their learners will benefit. As teachers, we need to reflect on what our purpose is as educators. Are we ready for the roller coaster ride? What competencies do we already have, and which competencies do we need to develop so we can offer our learners the best education possible - an education that will ensure they play

an active part in the South African economy when they leave school. What do we need to model to help them, in turn, develop purpose as learners?

The E³ competencies, which you are already familiar with, reflect what both learners and the teachers need to flourish in a changing world and to maximize the benefits of Project-based Learning. 21st century teachers should focus on the three competencies to start the journey of self-development: character, connection and thinking.

3.1 Character

Character embraces citizenship, curiosity, resilience and mindset - four attributes of the strong character underlying exceptional 21st century teachers. Let's unpack each.

- **Citizenship**: 21st century teachers care about their learners, about their country, and what competencies their learners need to find their place in society. As citizens of our nation, learners have the right to live here, to work here, start enterprises, and continue to develop themselves, and we as teachers should protect these rights at all costs. We are part of the team of nation builders.

- **Curiosity**: Successful teachers of the 21st century are curious and think, "What can I learn to make my teaching more relevant?" Because learners are tech savvy, teachers need to hone their tech skills too. Computers have taken the place of pens and pencils. Coding, robotics, the use of smartphones in the classroom and digital communication strategies, AI and blockchain, have all become part of the teaching repetoire. Start increasing your vocabulary. And if you don't know enough, find out to satisfy your curiosity . But also be curious about your own emotional development. Who are you as a person? Are you afraid of change? Are you a worrier or a warrior? Do you have the courage to embark into the unknown? Do you fear failure? Are you mindful? Do you stop for a moment to think about your professional purpose?

- **Resilience**: 21st century teachers can adapt to almost any circumstances to satisfy the needs of their learners. They are resilient - when things go wrong they bounce back. They reflect and then change the plan until they are satisfied that what they are offering is what the learners need. They have the mental ability to recover when things do not go according to plan.

- **Mindset is critical**: Keep learning. One of E³s driving goals is the promotion of life-long learning. As new tools and new technologies keep emerging, learning and adapting is essential. Develop your growth mindset and believe you can and stop worrying about things beyond your control. Focus on what you can do, and you can do anything! An effective 21st century teacher knows that learning about the latest gadget can truly transform students' education. So stay up-to-date on new trends because you know what your learners need to flourish.

3.2 Connection

Connection is the second most important competency group. 21st century teachers need to connect with technology but also with warm bodies - other people. They are thus collaborators and communicators, and show empathy as they connect.

- **Collaborator**: Today's tech tools allow us to connect with anyone, anywhere, anytime. Do you have a question for an expert or a colleague? Simply connect via social media, follow, join, ask or tell. Collaborate as a professional. Start or join a PLC. Learning is more effective when you can share ideas and knowledge with others. Sharing your expertise and experience, and communicating and learning from others is an important part of the teaching and learning process, and especially relevant in the 21st century.

- **Communicator**: 21st century teachers are often great communicators. Recent technological advances have affected many areas of our lives including the way we communicate, collaborate, learn and of course teach. These types of tech advances are important but the really challenging skill, ironically called a soft skill, is communicating for personal and professional development, face to face. Develop your confidence; speak up in meetings. Show kindness when dealing with learners one-on-one; show empathy when sharing learner problems with parents. Renew your effort to become a great interpersonal communicator in a century in which the tendency is to hide behind technology. 21st-century teacher show empathy. They are aware of their learners' future and know that good opportunities arise from great education. They strive to ensure that no child gets left behind. So they focus on preparing today's learner for what's to come in the future. They lobby for their learners. Today's classrooms are filled with children who need somebody to look out for them, to give them advice, to encourage them and to listen to them. Empathy is the ability to understand and share the feelings of others. This is not a far step from the entrepreneurial mindset that understands and sees the problems that others are experiencing and then wants to find a solution to help them.

3.3 Thinking

Thinking, the third E³ competency, covers creativity, critical thinking and reasoning.

- **Creativity**: Out-of-the-box solutions, fit for purpose groupings and custom-designed activities designed to address specific learner issues, and then linking all of this to the CAPS - this requires teachers to move out of their comfort zones and away from mere tick boxes. We invite you to grow your teaching toolbox and explore creative new strategies you have not tried before. Teach with WhatsApp, have learners start blogs or have them move about their communities, gathering information to share in class. Only then, go back to your textbook.

- **Critical thinking**: If you have ever wondered about the true value of group work and active learning in particular, then consider this: active learning helps promote higher order thinking such as the application of knowledge, analysis and synthesis. Clearly this is where critical thinking is developed. As a teacher, start engaging in deep rather than superficial learning and know how to apply and then transfer what you've learnt to the real world. Stay relevant by developing your own critical and problem-solving skills. PLCs are the group work of professionals. Join or start one today!

- **Reasoning**. Reason is defined as a cause or an explanation or justification for an action or event. Thus, the competency of reason is the ability of the mind to think, understand, and form judgments logically. Interestingly, there's a close connection between reason and emotion. As a teacher, you should be asking "Why?" - looking for reasons for learner behavior as opposed to making assumptions. No learner is the same, so judgment of the learner should be well considered before creating a label that a learner may have to carry for the rest of their life.

To conclude, 21st century teachers are different from traditional teachers in one huge way: they care - about their learners, themselves, their environments and their nation. They have a compelling purpose to make their classrooms places of discovery and joy, and they are prepared to learn and do almost anything in the service of their learners.

Session 4
The PBL facilitator – re-imagining traditional teaching

4.1 What used to work

Successful teachers in the not-too-distant past were those who were 100% prepared. They took time to study the lessons from the textbook and even made themselves notes so that

they would be able to answer all questions. They were strict but fair, and allowed no noise in class. Everyone worked quietly and studiously. They were truly organised and masters at their trade. They also suited learners from that generation and were equipped with the skills needed for that time.

Why is this style of teaching no longer successful today? Reflecting on the above, there are glaring problems which lead to very important questions:

· Can a teacher today ever be 100% prepared? Why? Why not?
· Is the textbook the best driver of a lesson? Why? Why not?
· Can teachers prepare well enough to answer all learner questions? Should they be there to answer their questions? What is their role?
· Is the word 'teacher' still relevant?
· Is a teacher who allows no noise in the classroom fair?
· Is a silent classroom an educationally sound learning space?
· What are the characteristics of teachers who are masters of their trade in the 21st century?

4.2 What will work in the 21st century

The Buck Institute of Education has listed a number of standards to describe the successful Project-based Learning facilitator:
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PBL facilitator	Traditional teacher
Designs and plans A learner problem arises and a lesson is created around it. She knows her curriculum and this will help her to link the problem to relevant CAPS information/knowledge transfer.	Selects a textbook and writes a lesson plan for that lesson. Sometimes uses scripted lesson plans.
Aligns to standards Knows the CAPS and links lessons to outcomes and expectations from the CAPS.	The textbooks are already CAPS-aligned so teacher does not need to take out her CAPS document at all.
Builds the culture Understands that school culture plays a huge role in modelling appropriate and meaningful relationships.	Classroom culture is not her concern. Who learners are and what they think is not her concern – as long as they do their work and keep quiet. She demands respect. Being kind leads to undisciplined learners.
Manages activities The project is designed around practical real-life solutions. There is very little transmission teaching. Learners are given a task with clear instructions and the teacher observes learners and helps them when needed. She is a class and activity manager.	There are no classroom activities. She presents the lesson and asks learners to summarise that lesson or even do a creative summary on a poster as a project.
Scaffolds student learning She understands that all learners are different and learn in a variety of ways. She sees her role as that of supporter, as each individual learner is helped to climb to the next level because of her one-on-one coaching.	She never allows group work and seldom has a private one-on-one with any of her learners. Once she has taught her lesson, she gives learners work, usually the questions at the end of the chapter, and she goes back to her marking. She has so many exercises to mark.

Assesses student learning In her classroom, there are 3 types of assessment and each is treated differently and has a different purpose: Baseline – Where should we start? Where are the gaps? Formative – How are we doing, every little step of the way? Summative – How did we do when tested on a chunk of work?	The marks that she allocates are used to decide whether a learner is successful or not. Paper and pen tests, she believes, are a solid gauge of learner progress, and knowledge and information are assessed because statistics give the best results.
Engages and coaches Her role is to pay attention to the needs of every learner and to offer them support, not via formal teaching, but by one-on-one coaching, especially as they work in groups.	No activities or homework are done in class. Classroom time is for her lesson, so she has no opportunity to coach learners or observe their progress.

Teachers need to reassess their roles. The time for good lecturing has passed. The time has come to put learner needs and their problems at the centre of lesson and to do everything in our power to make school useful for life after school, to help learners know and believe in themselves and to give them space to become problem solvers themselves, and, of course, to have fun! Learners go to school not to WORK, but to LEARN!

GO TO ACTIVITY 14 — HOW ARE YOU DOING?

GO TO ACTIVITY — SUMMATIVE ACTIVITY TOPIC 4

TOPIC 5 – THE GRADE R TO 12 PROJECTS

Session 1
A continuum of ALPs from grade R to grade 12

We are motivated by a huge compelling goal: that every young South African must be employed as an entrepreneur, have a job, or pursue an education journey after school. In Topic 5, we'll be examining the actual projects per grade that were undertaken in the past, and present small updates on the 2021 projects, which are not so different, but which have an Inquiry-based Learning, Problem-based-Learning and Design-based Learning, element to them. All the projects are driven by a community problem and link with real-life issues that prepare learners to deal with the changing world of work of the 21st century and how they contribute to youth unemployment by developing solution-seeking mindsets as learners tackle these projects.

During 2020 and 2019, E³ worked with Care-for-Ed (CfE) and the Six Bricks project as our Foundation Phase partners. The core objective of CfE is to mentor and train educators on ways to incorporate learning through play in their classrooms with the added benefit of providing blocks for this Play-based Learning. CFE advocates for learning through play because we know that play is a child's way of exploring the world, learning about consequences, how things fit together and how relationships work. It empowers children to become creative, engaged and lifelong learners. For this reason, teachers should be encouraged to include play-based pedagogy into their everyday teaching.

Care For Education is partnering with E³ to ensure that all children in the Foundation Phase are exposed to Play-based Learning - we are part of the continuum to ensure that all children throughout their 13 years of schooling develop the critical foundations needed to unlock 21st century skills.

In the 2021 projects for Foundation Phase, E³ will be trialling the CfE Six Bricks and other manipulatives (especially found objects like stones and waste, e.g., bottle tops) to build a purposeful playbox for teachers to use in encouraging Play-based Learning. Mini projects will be created for Grades R to 3 using these manipulatives in the course of each project, which will also follow the sequence of the PPBL discussed in the previous topics.

The CfE training in using the Duplo blocks that formed part of their initiative delivered excellent feedback: buy-in and an enthusiasm for implementation. There were noticeable changes in mindset and attitude towards Play-based Learning for most teachers. E³ are looking forward to presenting our brand new Foundation Phase projects, which will combine the Duplo manipulatives with other found and waste objects from the environment.

Session 2
The process of creating E³ projects and addressing training needs

We at E³ believe that for a project to be meaningful, it has to be driven by a challenging problem or critical question. The project has to be real and one that learners care enough about to want to solve. Thus, all the projects that form part of the E³ grade R-11 project bank were created around burning issues identified by teachers and provincial officials.

Challenges like poverty, cultural identity, the need for socially relatable role models, unemployment, climate change, career preparation for a changing world drive the E³ projects.

Written by teachers for teachers, E³ and teachers together have developed content for the projects or learner challenges that have been inserted into specific pre-agreed subjects in each grade. The grade R-3 projects integrate the subjects, Grade 4-6 projects are anchored in Life Skills, Grades 7-9 in Economic Management Sciences, and grades 10-11 in Life Orientation.

2.1 Project Assessment

Because the School Based Assessment in the third term is usually a project, these projects count for the school year marks necessary to pass the specified subjects and the relevant grades. Major learner-run projects that are grade specific are produced and updated annually and engage learners in solving a real-world problem or answering a complex question. The classroom mirrors the real world as far as possible. This year's projects are aligned to the 2021 ATPs.

Why this process?

The success of this pedagogical approach is that learners develop deep content knowledge as well as critical thinking, creativity and communication skills in the context of doing an authentic and meaningful project.

It is inspiring to see that since the inception of E³ in 2018, with the annual upgrades by teachers at a writers' workshop, the projects are improving and the learning is deepening. And the idea is that, with every year, new tools will be added to take each project to a new level. This year, we have added Inquiry-, Problem- and Design-based Learning as well as thinking maps which learners complete whilst chatting in their groups. This makes the learning visible. Even more inspiring, is the rise of new E³ believers who are creating their own projects in subjects that have not been included.

You met Michelle in Topic 3. She is one of a number of teachers who have taken the challenge of Project-based Learning. For them, there is no better way to teach. They endured the challenges but have also tasted the success of well-implemented Project-based Learning. E³ encourages individual teachers to create especially inter-disciplinary projects of their own and to share them with us.

The next phase in our PBL journey is to create projects which cover more than one subject across the curriculum. E³ aims to build an online projects data-base which will include, compare and contrast the best international and national practice. On this data-base, you will be able to access;

A.   A data-base of our own South African projects as well as international best practice
B.   Thinking tools from well-established partners (see thinking maps on page 56).

The South African E³ team are working together with the Ontario Department of Education and the I Think Centre at the Rotman Business School in Toronto. A national teacher website and especially our Teacher Connect WhatsApp platform are already providing open-source, first-rate facilitation materials as a core resource base for teachers. Not only will the resource bank grow, but so will the different approaches to training and development.

Good teachers are lifelong learners and the learning is also self-initiated because these teachers are purpose driven and their motivation is intrinsic - it comes from within. As part of E³, teachers will be offered many opportunities to learn and grow. They can successfully complete online training as an initial part of the process. The WhatsApp-based training, in which you are currently engaged, is at the White Belt level - the first belt of the teacher's

Black Belt programme that is currently being developed. After each session of each belt, you will earn stripes and badges, which will lead you to the next level of belts. There will be options for School Management Teams (SMTs) to sharpen their skills. All these programmes will be submitted to SACE for CPTD points.

Professional Learning Communities (PLCs) with our partners, the VVOB, competitions, and even a new National Teaching Awards (NTA) category for outstanding teachers are being explored.

Experienced coaches are assigned to implementing districts to support teachers for whom PPBL appears daunting. Your happiness and development are in your own hands. E³ will be there to support you every step of the way because, like Barack Obama, we also believe that: From the moment students enter a school, the most important factor in their success is not the colour of their skin or the income of their parents, it's the person standing at the front of the classroom. The future of a country depends on its teachers."

These resources have been created by Thinking Schools South Africa at admin@thinkingschools.org.za

tssa
Thinking Schools South Africa

THINKING MAPS APPLICATION TIPS

When you are **Defining…**

Key Words used	Questions asked	Applications
Tell me everything you know about this topic, List, Define, Note the key points, Name all the types (of fractions, forces, habitats, plants, animals, qualities, points of interest) in this topic. Brainstorm, discuss.	What do you think this word means? What did we learn about this topic? What are the main issues raised in this video/book? What are all the points you want to make (or learn) about this topic? What are all the ways of getting to this answer/number?	Formative Assessment of what students already know about a topic. This includes misconceptions, which you can be aware of. A starting point to gather all ideas – firstly your own, and then perhaps more from peers, video or written material; or pre and post revision.

…then the Thinking Map to use is

Note: You can use the Circle Map to measure growth in your thinking, such as checking and self-correcting information that is incorrect and adding new information in a different colour.

THE CIRCLE MAP

All information is gathered here

Topic

i.e. what you know

How you know goes in the outer rectangle: sources, experiences, influences, points of view
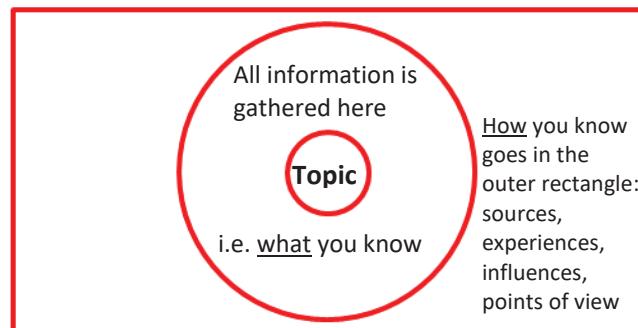
When you are **Describing…**

Key Words used	Questions asked	Applications
Describe feelings, attributes, characteristics, properties, adjectives, qualities. Use each of the 5 senses to explain how it feels, smells, sounds, tastes, looks.	How would you describe this in your own words? What is this really like? Which words would paint a vivid picture of it in your mind?	Generate rich and original adjectives before writing – to describe a setting, a character, or situation. Considering the properties of materials or visuals in Natural Science, Design and Technology or Art.

…then the Thinking Map to use is

Note: The Bubble Map is for adjectives only.

It is not a Spider Diagram! (If you are looking for a Spider Diagram, either collect main ideas in a defining Circle Map or main headings in a classifying Tree Map, in which case you can also add sub-points under those headings).

THE BUBBLE MAP
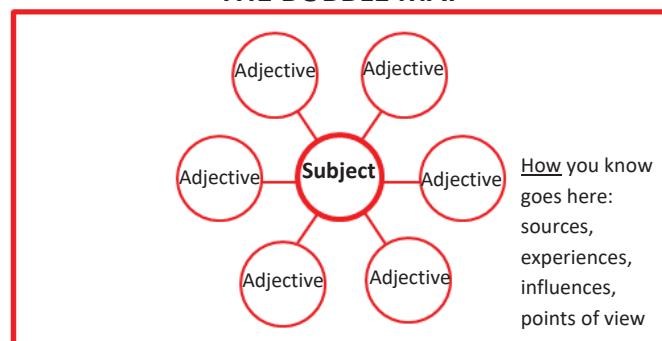
Adjective
Adjective
Adjective
Subject
Adjective
Adjective
Adjective

How you know goes here: sources, experiences, influences, points of view

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tssa
Thinking Schools South Africa

When you are **Comparing and Contrasting…**

Key Words used	Questions asked	Applications
Compare/contrast, discuss similarities/differences, distinguish between, differentiate, what things/concepts have in common or not.	What are the similarities and differences between A and B? What do they have in common? What is unique to only one of them? What distinguishing features help you identify them from each other?	Compare and contrast characters in a book/film, two shapes, methodologies, countries, time periods, formulae, technologies, types of plant or animal. Clarifying identifying properties that enhance understanding of forms, functions, applications and meanings.

…then the Thinking Map to use is

Note: Be careful to connect the lines to the rights places, based on the properties that link or differentiate A and B. Use the most striking or meaningful similarities and differences without mechanistically mirroring them (e.g. tall and short may be less distinguishing than that A is gangly and B is well-dressed). A and B can have different numbers of differences.

THE DOUBLE BUBBLE MAP
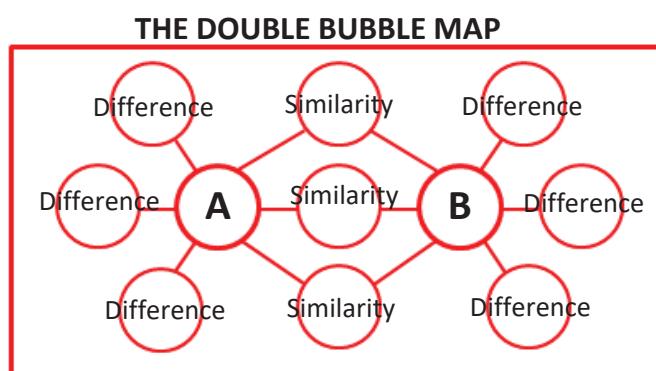
When you are **Classifying…**

Key Words used	Questions asked	Applications
Classify, sort, group, categorise, give related detail, types of, kinds of, list and elaborate, taxonomy	How might you group the main ideas, supporting ideas and details in this topic? What are the key headings in this unit of work/project/talk/essay? Can you sort all the information you have gathered into key concepts? What important details do you want to add under each heading?	Making notes or summaries in any content area – students think about the category headings and the details of what they learn. Categorising information from a Circle Map in preparation for writing about a topic or giving an oral presentation. Collecting information under predetermined headings whilst reading a text.

…then the Thinking Map to use is

Note: Be careful to draw the Tree Map exactly as structured here.

You can use the Tree Map to give students an overview of a subject, to see what is coming up and how units of work fit in. It is also extremely useful for revision.
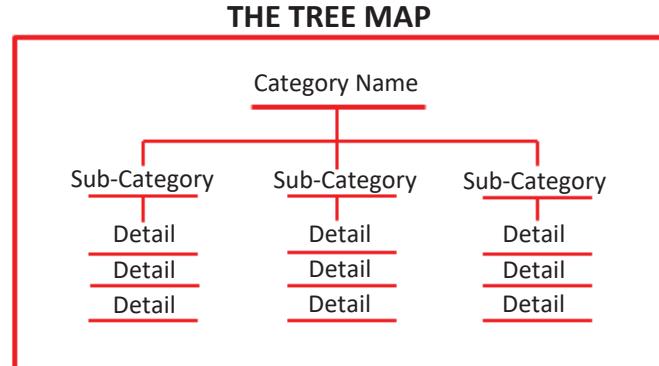
THE TREE MAP

These resources have been created by Thinking Schools South Africa at admin@thinkingschools.org.za

tssa
Thinking Schools South Africa

When you are **Sequencing…**

Key Words used	Questions asked	Applications
Sequence, map the steps in this project, put in order, order, recount/re-tell, what happens next, cycles, patterns, processes, change, solve multi-step problems	What is the process/project you are sequencing? What is the step-by-step sequence of events in the process/project? What are the sub-stages? Is each step in the right order?	Mapping a sequenced step-by-step project in PBL. Life Cycles and processes in Natural Science/Social Science. Time lines in history. Planning the sequence of a story for writing/recording the sequence of a story. Recording a thought process, such as in problem solving.

…then the Thinking Map to use is

Note: Make sure that the Flow Map has arrows showing the order of events/stages. For life cycles it becomes a circle.

General Note: Whilst it is vital to apply the Thinking Maps with the elements of each map exactly as they were designed, please don't squeeze student thinking to the size or number of circles or blocks. Freehand maps that are corrected as they develop, capture more expansive thinking!

THE FLOW MAP

Stage 1 → Stage 2 → Stage 3

Sub-stages can be added if required (optional)
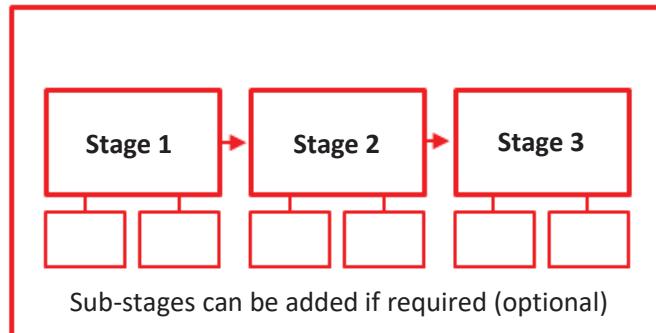
Session 3
The E³ project package for each grade

The projects you will be receiving were originally written for teachers by teachers. You and your colleagues supply the problems driving each project, and your updated notes on the original projects are included in this edition of the project. Thank you very much for owning the projects and also for taking the projects to a new level. The result is projects that are stronger and more robust, but also much more creative. They also offer the learners deeper cognitive challenges in this first implementation, using the new E³ conceptual framework.

For this year's E³ projects, you will receive the following: three booklets per grade: 1 Teacher's Project Notes; 2 Learners' Workbooks and 3 Resources.

1, the Teacher's Project Notes give you a step-by-step description of all the lessons, lists of resources, some background, and research and our rubrics have also been added to the end of the Teacher's Project Notes. The Planner per grade is included in the Teacher's Notes. This is a change from the past where you had a one-page overview of each planned lesson. WE have changed our plan in order to save the provinces on printing costs. The Learners' Project Workbooks are still divided into worksheets, which ensure that learners remain engaged every step of the way.

To recap, you will receive three booklets per grade. E³ has equipped you for a successful journey in driving your project. Use these resources. They will lighten the load and ensure that the learning is activity-based and then - have fun!

Session 4
The Grade R to 3 Projects

In the foundation phase, learners will tackle problems linked to the CAPS curriculum. The projects will be integrated and incorporate Life Skills, Languages and Mathematics. Teachers and learners will be encouraged to start a Purposeful Play Box and collect "found objects" such as cardboard boxes, material scraps, wool scraps, bottle tops, plastic bottles, etc. These, along with manipulatives in the form of plastic blocks (which will be provided for each learner) will be used by learners to solve the problems. The process will be the same as the higher grade, but the time frame per project will be shorter and the activities suited to learners who may still be learning to read, write and manage their number concepts. The projects are designed to bring play back into the classroom in a purposeful way and stimulate competencies such as collaboration, creativity and critical thinking. The projects are multisensory and integrate all developmental areas.

4.1   Grades 4 to 6 Life Skills

Grade 4: the problem we are solving in Grade 4 is that of cultural identity. South Africans get to celebrate heritage day on the 24th of September, which sits in term 3, making it the ideal time for this project. Although we have this wonderful day to celebrate our rainbow heritage, there is still a level of ignorance, distrust and fear between different cultural groups, which can lead to rejection and anger.

In this project, we focus on the burning issue of a lack of cultural pride and identity. Learners will showcase and celebrate traditional and cultural foods through a recipe book, a poster, and then create a specific menu to celebrate Heritage Day. The aim of the project is to improve cultural awareness in the school by celebrating different cultures through sharing our favourite foods.

Grade 5: the problem that is presented in Grade 5 Life Skills is that of water scarcity. Once again, the assessment for term 3 includes a project. This project has been set out for you,

including its rubric. We all know that South Africa is a water-scare country, which means that this essential source of all life on the planet needs to be respected, protected and conserved. In this project, learners will create and present a project where they inform their peers about the importance of water and motivate them to save and protect water. This project is designed to develop the learners' thinking skills.

Grade 6: the problems we are addressing in the Grade 6 E³ project is that of bullying. The assessment for term 3 also includes a project and there is no extra load on teachers since the project has been set out in all its phases and we have included a rubric for assessment. Let's unpack the project. Bullying has always been an issue in our schools and its impact has been underestimated until this year, 2021, when a learner committed suicide after a bullying episode at school. Many provincial Education departments decided to have dialogues and campaigns to raise awareness on bullying. Teachers, learners and parents need to be made aware of the impact of bullying on the learners. Importantly, bullies also need help to stop the act of bullying.

The grade 6 learners will be asked to design an information leaflet on bullying to assist the school in dealing with bullying. The leaflet will include information on : what is bullying or what constitutes a bullying act, types of bullying, reasons why people bully and how to help bullies.

An alternative project is: Writing a section for the school policy on bullying, including all the information in the information leaflet.

The public event: For the public event, we propose that the entire school community, that is teachers, learners and parents, all be invited. Other stakeholders will also be invited. These stakeholders include amongst others, the Department of Health (psychologists, psychiatrists, nurses, etc.) and the South African Police Services. The project develops empathy towards each other and decision making skills when they come across a bullying act. They also learn that small bullies, if not attended to, will grow into bigger bullies and become violent members of the community. On this day, all members of the community work together towards finding a solution to this undesirable act. Learners become part of the community in resolving challenges facing the community. They also learn how to collaborate and work together to solve a problem. It also elevates their communication skills and raises curiosity and problem solving skills in finding solutions to challenges facing them at school, but ultimately also in life.

Session 5
The Grade 7 to 9 Projects

Grade 7: The problem we are solving in Grade 7 is that of organising a successful Entrepreneurs Day to raise money and leave a legacy for the school. The E³ project solution is to conduct an entrepreneurially-driven Entrepreneurs Day. It starts with a journey of discovery and research into what entrepreneurship is, what characteristics entrepreneurs display, and what skills are needed to succeed in the world of business. The end-of-project display of work is an Entrepreneurs Day which the Grade 7s organise and where their different groups will sell their products or present services at their stalls. The CAPS outcomes for term 3 integrated into the project include among other aspects of entrepreneurship, the characteristics and skills of an entrepreneur, a SWOT analysis, principles of advertising, budgeting for the Entrepreneurs Day, and an income and expenditure statement, as well as the actual hosting of the Entrepreneurs Day. The assessment for term 3 includes a project for 50 marks, thus there is no extra load on you. The project has been set out and even includes a rubric.

Let's unpack the project itself. Grade 7 learners will form groups and these groups will take the form of a small business. The groups brainstorm ideas for a product or service they can present and will then start generating ideas of how to run a profitable stall at the

Entrepreneurs Day. Throughout the term, the groups/small businesses will work on various aspects of entrepreneurship, such as advertising and budgeting, to ensure that they prepare their stalls for the Entrepreneurs Day.

The public event: Organising the Entrepreneurs Day can be a challenging experience for younger learners, but with the guidance of their teacher this can be a rich and fulfilling experience which not only involves learning, but also provides them with first-hand experience of the entrepreneurial world and allows them to feel a sense of pride in fundraising for their school.

The competencies and skills in this project: The fact that the learners have used entrepreneurial skills to run a business is a great way of feeling accomplished and will start stimulating their minds to think critically and creatively about the possibility of becoming entrepreneurs in the future. These skills are aligned with the competencies promoted by E³. Collaboration and teamwork, communication and critical thinking, and the formation of a resilient, self-reliant and driven character that seeks to solve local problems.

Grade 8: The problem that we are solving in Grade 8 is the importance of identifying socially relatable role models in developing entrepreneurship and leadership skills. The E³ project solution is to identify and do research on an inspirational role model. The end-of-project event is the celebration of this local hero where learners will provide visual representations of the hero. The CAPS outcomes for term 3 integrated into the project include, among other aspects of entrepreneurship, the forms of ownership and how small businesses and entrepreneurs play a role in sustainable job creation and the sustainable use of natural resources. The assessment for term 3 remains a case study that is provided.

Let's unpack the project itself. Grade 8 learners will form groups and these groups will identify a local hero in their community that they would like to interview. The group prepares questions for the hero and then conduct the interview. The heroes could come to the school or can be interviewed on video. The groups then capture this information and prepare a visual presentation of their local hero for a public display.

The public event: The sky is the limit and depending on what is manageable by the school, there are many possible opportunities for a public event. There could be a gallery where presentations of local heroes are showcased in a type of walk of fame, also the local hero could be invited to the school for a fireside chat.

The competencies and skills in this project: the learners have used and acquired numerous research, interview and writing skills as well as the skills that are aligned with the competencies promoted by E³. Collaboration and teamwork, communication and critical thinking that seeks to solve local problems.

Grade 9: The problem we are solving in Grade 9 is how starting a business and creating self-reliance can be a solution to problems such as poverty and unemployment. The E³ project solution is to identify a viable business idea, create a business plan and present the business plan to a panel of judges. The end-of-project events are the showcasing of their businesses through a display and also a business presentation. The project runs over two terms and thus the CAPS outcomes for term 3 and term 4 integrated into the project include, among other aspects of entrepreneurship, the functions of a business and the various components of a business plan. The assessment for term 3 remains the analysis of business functions through either a presentation or a poster with all the rubrics provided.

Let's unpack the project itself. Grade 9 learners will form groups and these groups will identify a viable business idea. The groups will then work through the components of the business plan and create a business plan that they will present. The groups will then showcase their businesses through a display and also do a business presentation to a panel of judges.

The public event: The public event is twofold. Firstly, the groups will showcase their businesses through a display where people can walk around and see what the various businesses do. Secondly, the groups will present their business plans to a panel of judges taking the form of a Dragon's Den.

The competencies and skills in this project: The learners have used skills that are aligned with the competencies promoted by E³. Communication and collaboration to work together to create and present a business plan, and critical thinking and creativity to identify a business that can solve local problems.

The projects for Grades, 7, 8 and 9 EMS all aim to solve local problems. They have meaning for our learners, they are fun and most of all, they develop the skills that our learners need for changing the world of work.

Session 6
The Grade 10 and 11 Projects

Grade 10: The driving question that the Grade 10 learners will explore is: How would you share information about careers of the future with grade 9? High school learners can no longer rely on their knowledge of traditional careers when planning their futures. The 21st century world of work is a vastly different space. The E³ solution is for the grade 10 Life Orientation class to plan a future-focused career expo to expose grade 9s to new career options as well as to equip themselves with skills in logistical planning, engaging with speakers, presentation skills and much, much more.

This project consists of three phases: *Inquiry phase*, *Problem phase* and *Design phase*, each with a sub question to help scaffold learners in the process of finding out about careers and how they might prepare content for the expo. Learners will use a series of thinking tools to help make learning visible, conduct interviews and engage in group work, which will help them to develop their skills and create an innovative and exciting careers expo for grade 9 learners. In this process, learners cover the following term three CAPS content Careers and Career Choices, which encompasses diversity in jobs, work settings, workplace environment and conditions, skills and competencies, and opportunities in different fields.

In addition, the following competencies and skills covered in this project include planning, logistics and problem solving skills as well as soft skills like teamwork, collaboration, presentation skills and critical thinking and analysis.

Grade 11: The Grade 11 project deals with risky behaviour, risky situations and its impact on healthy lifestyles of South African Youth. This issue is supported by the survey that was conducted recently, where risky behaviour like, substance abuse, sexual behaviour, teenage pregnancy, STIs, teenage suicide, hygiene and dietary choices, as well as unsafe road use were identified.

The project further helps learners to address these situations and investigate mitigating factors to address these. Learners also learn about the impact of these on their personal lifestyles. Learners gain skills of decision making, making informed decisions and learning how to solve the problems they face as teenagers. Learners learn how to improve their communities and make them safer for everybody.

Learners carry out deep research on these issues within their own contexts/communities and conduct interviews with community members on addressing these societal ills. Learners learn to collaborate with the larger community in seeking solutions to mitigate risky behaviours and situations.

Learners do a presentation to the entire school community and other stakeholders to share their findings on risky behaviour and situations that are prevalent in their contexts. They also share findings on how to address these behaviours and make their communities safer.

TOPIC 6 – SUPPORTING E³ AND PBL IMPLEMENTATION

Session 1
Coaching and mentoring

At the end of 2019, the E³ monitoring and evaluation team analysed the results of their data. They found that there was an outcry for more teacher support toward helping children become more actively engaged in the classroom and better prepared for the 21st century and the challenges of the Fourth Industrial Revolution. As a result, the team decided to appoint co-facilitators and coaches who could assist provincial master trainers to train teachers as well as to visit and support schools during the implementation of the third term active learning projects. The role of the coaches included five areas. Planning, observation, support, reporting and reflection.

COACHES		
AREA		
Planning	To meet the DCESes and be assigned co-training sites with the DCESes.	Provide coaches with a letter of introduction to schools from the DG. Facilitate their meetings with the DCESes in order to establish the protocols per province.
	To engage with Principals and SMTs to set expectations.	Ascertain with the DCESes as to how the coaches should liaise in terms of the best strategy to engage with principals.
	To create a space for dialogue with the teachers to plan how to implement the PBL project in the classroom in terms of logistics and mindset.	Provide the Project Planner as a guide to PBL in the classroom.
Observation	To observe every teacher in their mentee group.	Provide a reflection and feedback template with space for additional insights from coaches.
Support	To ensure SMT support (informing, information gathering, etc).	Provide a list of probing questions.
	To identify challenges and brainstorm solutions with teachers after observation visits.	Provide an observation template with space for additional insights from coaches.

	To listen to, acknowledge and document learner stories in terms of the overall goals.	On the observation template, there will be a space for feedback on learner engagement, competency development and stories. (Verbally, voice notes, reports, etc.)
	To utilise WhatsApp group communication with their teachers as part of the support process (once a week).	Remind coaches to get phone numbers and create a WhatsApp group and "meet" them on a group once a week to track project progress, facilitation issues, challenges, etc.
	To initiate PLCs and create a sustainable plan for PLCs (also in order to achieve SACE points).	VVOB to assist in training of coaches. Assist the coaches to plan for meetings, ensure 4 solid interventions that are action research-based and which deliver results and documented as specified by SACE so that they can upload 10 points.
	To train how to facilitate a PLC.	Included in VVOB training
Reporting	To E³ (verbal, videos, voice notes, written reports).	Set the expectations for what reports are required in a document in the training.
	To provide Website uploads.	Orientate them to the E³ website and show them the protocols as to how to upload their stories, feedback, etc.
	To participate in Coaches' WhatsApp group.	E³ to set up a Coaches' WhatsApp group.
Reflection	To conduct a reflection process at the end of term 3 with their teachers during the last PLC.	Provide a framework for reflection guided by input from the M&E team.
	To attend an E³ reflection session with E³.	Provide a framework for reflection guided by input from the M&E team.

Session 2
Mobilising the district and the DTDCs

2.1 Mobilising the districts

Mobilising the districts will involve an advocacy campaign to make sure that the E³ message reaches everyone. It began in early December of 2019 with the Minister's Meeting with District Directors, and the DBE MaLekgotla. E³ participated in the Director General's Provincial Engagement in all Provinces and nearly 33 000 concepts and other documents were circulated. Finally, E³ is included as a standing agenda item on all reporting structures.

2.2 Why it is important for districts to be mobilised?

Firstly, the districts work directly with circuits and schools, and their main function is the implementation and management of the National Curriculum Statement. They are there to provide support to Deputy Chief Education Specialists, and to provide oversight and support to schools. They implement and oversee school competitions, advocate E³ during engagements with structured meetings with principals, engage with teacher unions at the local level, and they include E³ in the District Management Plans and Annual Performance Plans.

2.3 The role of the District Teacher Development Centres

The DTDC start by doing the skills audit and then plan and implement teacher training programmes. They are responsible for capturing and submitting SACE points and they are the liaison between relevant stakeholders, such as teacher unions and other entities. They also coordinate the National Teacher Awards and attend the Provincial Teachers Training Committee Meetings.

The DTDC will take charge once the annual teacher training plans are approved and budgets are provided, and then training planning sessions will take place during September and October for the following year.

Other Important information
You might want to know that the funding for the DTDC is provided through the ETDP-SETA and the 1% Levy, and that the training is demand-driven, which makes it fit for purpose.

Session 3
PLCs and the power of PLCs

3.1 What are Professional Learning Communities?

Professional Learning Communities are groups of professionals in our present context, such as teachers, who decide to come together to learn with and from each other on needs they themselves have identified.

PLCs are communities that provide the setting and the necessary support for groups of classroom teachers, school managers and subject advisors to participate collectively in determining their own developmental trajectories and to set up activities that will drive their development. PLCs are fully embedded in South African policy, as cited in *the integrated strategic planning framework for teacher education development*.

> *"PLCs are communities that provide the setting and necessary support for groups of classroom teachers, school managers and subject advisors to participate collectively in determining their own development trajectories, and to set up activities that will drive their development."* *(ISPFTED, p.14)*

3.2 Why are PLCs important to E³?

E³ teachers will be at the forefront of changing teaching and learning in South Africa. In order to be the trailblazers and tone setters of change, E³ teachers need to become reflective practitioners who engage in lifelong professional development and action research. This includes engaging with likeminded teachers on the implementation of Project-based Learning in classrooms.

PLCs offer the platform for this engagement and E³ has chosen PLCs as one of the key mechanisms so support teachers. Global research confirms that exchanging experiences and learning from each other directly is a form of support most appreciated by teachers.

The very nature of PLCs allows teachers to direct and take charge of their own professional development. The following characteristics of PLCs confirm this. PLCs are driven by the needs of teachers and focus on content and real classroom issues. They allow for the sharing of materials and teaching strategies and support innovation by infusing new ideas into teaching practice. PLCs support collaboration and create a safe space for teachers to share ideas and collaborate in their learning. They allow teachers to profile models of best practice to provide guidance to fellow teachers and create a platform for coaching and expert support. They provide opportunity for feedback and reflection and create the opportunity for teachers to meet regularly to discuss teaching and learning.

PLCs are the perfect professional model to support the change we want to bring. E³ hopes to encourage and support teachers to establish PLCs to plan and reflect on the implementation of Project-based Learning and the activation of 21st century competencies in learners. When establishing your own PLC, consider the following essential ingredients of effective PLCs:
- There must be mutual trust and respect amongst members, in other words, a safe environment to openly share.
- Members, in this case teachers, must set the agenda. Members must be motivated by a sense of collective responsibility for student learning.
- PLCs need to be supported by the school management and successful PLCs need to be skilfully facilitated. When necessary, input from external experts must be sourced.

3.3 What can you expect from the E³ team?

The E³ team will support teachers to establish PLCs. The E³ coaches will play an ongoing supportive role to the PLCs. Some PLCs will be facilitated using technology where teachers will connect with other teachers at a distance while other PLCs will rely on more direct forms of face-to-face dialogue.

In conclusion, peer learning and collaboration among teachers is amongst the highest indicators of effectiveness in teacher development. It allows teachers to learn from colleagues, transfer that knowledge to their classroom practice, and be reflective about what they have learnt.

GO TO ACTIVITY 15 — **PROFESSIONAL LEARNING COMMUNITIES**

Session 4
Celebrate and support visits

4.1 School visits
There are two types of visits to school – 'Celebrate and Support' visits and Monitoring and Evaluation (M&E) visits. The visits are very different in terms of function.

Annual school visits are planned to a sample of E³ schools with the purpose of celebrating success and offering developmental support.

The impact of the pilot is being measured by a professional monitoring and evaluation team. Their processes measure the mindset and competency of teachers and learners, as well as the development of schools and surrounding stakeholder communities towards the goals of E³.

This formal monitoring and evaluation process rigorously engages with key stakeholders and conducts classroom observations to inform the teacher development model.

Session 5
Supporting schools - The partnership and stakeholder relationship workstream

Teachers need to extend teaching beyond the walls of their classrooms by collaborating with partners to create innovative learning environments.

Teachers are encouraged to actively engage with civil society and business to create expanded learning opportunities around their classrooms to support the building of 21st century skills and competencies in their learners.

5.1 How do we go about rethinking teaching and learning in 21st century classrooms by activating partnerships and networks?

Teachers need to engage with partners to introduce learners to a range of possibilities and resources in the classroom. Engagement with partners will, enrich the teacher's understanding of active learning pedagogy, bring the curriculum to life, create authentic learning experiences for the learners. Central to authentic teaching are realistic real-life problems, which are interesting because they are more relevant, complex and challenging than more simplified educational ones.

Engagement will link learners to real-life problems and hands-on experiences, as well as to socially relatable role models. Global research has confirmed the value of this approach to improve teaching and learning. Hargreaves and Fullan tell us teachers who aim to create innovative learning environments should build and maintain the capital they need as organizations. This includes social capital, intellectual capital and professional capital. This can be done through forging alliances, partnerships and networks. Partnerships are not only about enriching learning environments within but extending their boundaries outwards and creating networks in the process.

5.2 What are the implications for teachers?

Teachers need to understand their role. The role of the teacher is to design and facilitate authentic learning experiences by bringing the outside world into the classroom. Teachers need to establish and build relationships with business and civic society in order to facilitate these real-life experiences. Teachers need to actively use learning experiences to link learners with the outside world and build networks and opportunities.

Teachers need to rethink the role of extra and co-curricular programmes, the role of play, and how to facilitate the process effectively for optimum learning. These present learning opportunities for both learners and teachers.

The E³ team will provide support to this process by setting up a national platform. The E³ program envisions creating a platform for all education initiatives working with DBE schools who are striving to bring 21st century skills into the pedagogy both in the class and out. E³ will establish partnerships with a number of role players, such as civil society organizations, volunteers, and businesses and government departments, to create ecosystems around schools. These ecosystems will support and add value to the efforts by the teachers in the classroom so that learners are integrated into a broader ecosystem of support and opportunity.

Teachers are encouraged to visit our website to meet our signed-up ecosystem partners and see what they are up to in E³ schools around the country, using this information to build their own ecosystems of support around their schools and classrooms.

Session 6
Parent power

6.1 Parent involvement is part of the success

The E³ programme has the vision of mobilising parents so that they are aware of, know about and enthusiastically support their children, the teacher and the school to implement the E³ model and Project-based Learning to activate 21st century skills and competencies. This involves making parents active partners in the learning journey by forming strong partnerships between parents, teachers and schools to create a learning community.

This partnership is more than parental involvement in social events, fundraising efforts or the traditional involvement in the PTA. Rather, it's about ongoing collaboration focussed on supporting the goals of activating these 21st century competencies. An active and thought-through mechanism needs to be put in place to support parent involvement in activating 21st century competencies. Research has proved that bridging the gap between home and school improves learner functioning and performance. An integral part of the process is to acknowledge the worth of parent involvement in the process.

The school management team is a key custodian of establishing relationships between school, community and parents and must play the role of mobilising the parent partnership component. The South African Schools Act cites the importance of school-driven, capacity-building programmes for parents which should include strategies to motivate parents to engage in learner's education.

Teachers in turn, need to give parents an active role in the innovation in the classroom, starting with the shared vision. They need to build shared values and responsibility for the outcomes. This should include the building of understanding of the new approach and creating excitement to build support.

By sharing the new approach and building a common vision, parents become equal active partners on the journey. They feel empowered and capable with their knowledge of the

learning process. Parents become real partners in changing teaching and learning.

Advice to teachers: make the parents a real part of the learning journey. Efforts must be collaborative and genuine. There should be meaningful roles for each party to play and these must be clearly communicated. Foster interaction around the curriculum and Project-based Learning, and include public events to celebrate each project after completion. Profile lifelong learning as important for both parent and learner. At school level, teachers should lead change in the school and advocate for active learning pedagogies at school meetings.

6.2 What can be done to activate this vision?

Schools can start parent empowerment programmes to develop the understanding commitment to the common goal and to develop an understanding of their role. These parent programmes should be needs-driven, focus on building an understanding of 21st century skills and competencies, and should include the vision of support to out-of-school learning.

GO TO ACTIVITY 16

GO TO ACTIVITY SUMMATIVE ACTIVITY TOPIC 6

TOPIC 7 – INTERCONNECTEDNESS AND SELF-DETERMINATION

Session 1
Self-determination theory and the power of happiness

Behavioural economists and behavioural science specialists link playful Project-based Learning to not only the achievement of THE one compelling goal, i.e., reducing youth employment and giving young people a place in the economy, but also to creating purpose and meaning in the lives of learners and teachers.

1.1   Self-determination theory

Welcome to this brief introduction of Project-based Learning and its foundations in self-determination theory. A good place to start is with economic historian, Stephen Davies, who dates the modern form of the school all the way back to 1806, the year Napoleon defeated Russia. Stung by its humiliation, the Russian state took the advice of a leading intellectual and advised a programme of compulsory and rigorous education. The purpose of education was mostly to train young men to be obedient soldiers and not run away in battle.

This form of schooling introduced many of the features we now take for granted, such as children sitting in rows of desks in front of a standing teacher, a set school day (punctuated by the ringing of bells), and a predetermined syllabus. This form of education proved very effective in its intended aim of producing uniform and obedient soldiers, and spread throughout America - and then the rest of the world. The model continued to prove effective and was great for the economy throughout the industrial age of the 1900s. Most men worked in factories and the demand for an obedient and uniform factory worker was high.

GO TO ACTIVITY 17

1.2   A changing world

However, today, in a world that's dominated by new technologies that are rapidly changing, a very different kind of worker is needed. The top skills required to enter the working world in 2021, among others, include complex problem solving, critical thinking, creativity, emotional intelligence and judgement, and decision making. This is a far cry, perhaps even the opposite of what is required to be a soldier or a factory worker. This form of education took no interest in the happiness and the passions of the teacher in teaching and enriching the lives of their pupils, nor of the student to explore, learn and create.

The need for a new form of education is clear. Project-based Learning has the potential to solve all of these problems. PBL is a dynamic method of teaching, which gives the students the opportunity to develop knowledge and skills through engaging projects set around challenges and problems they may face in the real world. This allows to them to learn and develop skills through doing. In the words of Swiss psychologist, Jean Piaget, "Knowledge is the consequence of experience".

Further, by allowing pupils to work in their own way, PBL begins to cater to the 21st century skills required by the workplaces of today and moves away from industrial age values. Pupils will develop their complex problem-solving and critical thinking skills, their creativity and their ability to manage and coordinate with other people, as well as many of the other skills required for the modern day workforce. It gives the students autonomy over their learning, which not only allows them to develop their skills of self-management and to work at their own pace and style, but also provides one of the main foundations of intrinsic motivation and happiness, as we will see in a moment.

The learning achieved is authentic, grounded in real-world experience and practice, and does not solely rely on lecturing and memorisation. Until now, the education system has relied on stringent structures, syllabuses, schedules, and targets and deadlines to motivate both teachers and students to achieve their prescribed outcomes. This system is reinforced by both rewards in the form of good grades and recognition, and punishments in the form of failure and detention and the like. PBL gives up a lot of the system's control over the process and the syllabus and puts control in the hands of the teachers and learners.

1.3   Intrinsic and extrinsic motivation

Many of the traditional rewards and punishments are no longer as effective as they were, leaving us with a problem on how to remotivate the pupils to succeed. We cannot punish them as we used to. This question leads us to the latest scientific understanding of human motivation and the difference between intrinsic and extrinsic motivation:

- Extrinsic motivation refers to behaviour that is driven by external rewards such as money, fame, grades, praise and typical punishment. This type of motivation arises from outside the individual by external forces.

- Intrinsic motivation refers to the behaviour that is driven by internal rewards, in other words, the motivation to engage in a behaviour arouses from within the individual because the behaviour itself is naturally rewarding and desirable to that person.

Furthermore, the result of behaviours that are driven by these two different kinds of motivation are fundamentally different. Extrinsic motivators drive performance only so long as an external reward is offered, whereas intrinsic rewards continue to motivate because the reward is internal. When an extrinsic award is dropped, motivation also drops, and in the case of education and learning, this is the opposite of what we would like to achieve. Not only do extrinsic rewards fail to motivate once they are removed, they can even undermine any intrinsic motivators that were present in the first place.


GO TO ACTIVITY 18

1.4   Why extrinsic motivation fails

This phenomenon is referred to by behavioural scientists as *motivation crowding*, and could be the reason why the natural desire of a child to learn seems to so often be undermined by the education system.

Furthermore, extrinsic rewards are only proven to be effective in motivating algorithmic and rote behaviours, such as the rote factory work of the 19th Century, but they are unable to motivate complex thinking processes and creativity. This is a key point because PBL and the skills required during the 21st century workforce rely almost exclusively on this kind of thinking and creativity.

INTRINSIC VS. EXTRINSIC MOTIVATION: WHY WE DO WHAT WE DO

Because of the interest and enjoyment in the task itself

- Enjoyment
- Purpose
- Growth
- Curiosity
- Passion
- Self-expression
- Fun

Intrinsic

Extrinsic

Because of the outcome that will result by doing the task

- Promotions
- Pay raises
- Bonuses
- Benefits
- Prizes
- Winning
- Perks
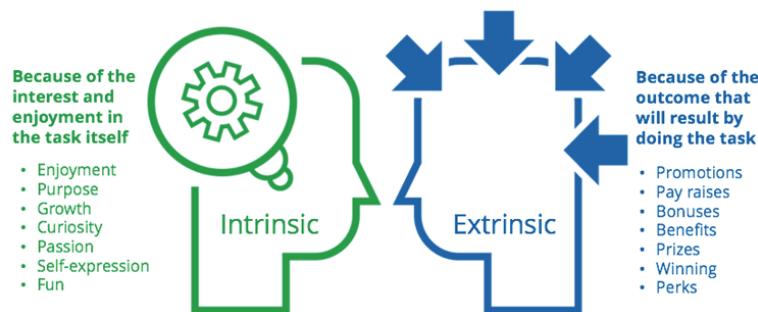
It is now clear that PBL will have to rely exclusively on intrinsic motivation and extrinsic motivators and as such, your typical grades and punishments will have to be dropped. But how do we cultivate intrinsic motivation when it cannot be dispensed by the system? Rather, it is in the hands of the students themselves to have any control over their internal motivations. The answer is that we are going to have a lot more influence on intrinsic motivation than what was once thought.

Self-determination theory helps develop intrinsic motivation.

> *"Self-determination theory suggests that people are motivated to grow and change by three innate and universal psychological needs. This theory suggests that people are able to become self-determined when their needs for competence, connection, and autonomy are fulfilled."*
> *(Deci and Ryan, 1985)*

SELF-DETERMINATION THEORY

Competence

Humans' three basic needs

Relatedness

Autonomy

need to be effective in dealing with the environment

need to have a close, affectionate relationship with others

need to control the course of their lives
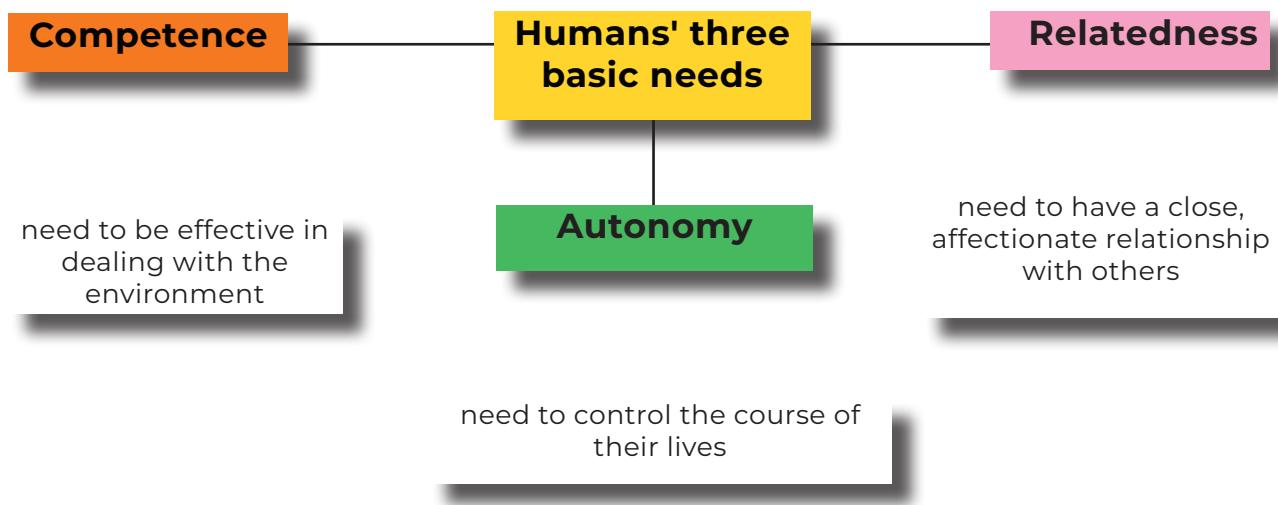
Once teachers understand that competencies are indispensable, and that they appreciate the value of interconnectedness and close relationships with others (like the learners, colleagues and parents), all they need from their SMTs and principals is some freedom to try out new ideas within the safe space of their classrooms. They will then begin to display the third component of self-determination: autonomy:

> *Autonomy can be defined as the ability of the person to make his or her own decisions. Defined from a human resources perspective, it denotes a (relatively high) level of discretion granted to an employee in his or her work. In such cases, autonomy is known to generally increase job satisfaction. (Wikipedia, 2021)*

GO TO ACTIVITY 19

Session 2
TeacherConnect unpacked

You will have been introduced to TeacherConnect at the beginning of this course. In case you want to share the information with a friend who wants to join E³, a quick recap:

TeacherConnect is a WhatsApp-based platform that enables us, the E³ team, to interact with a group of users such as the Master Trainers and teachers.

It is not the same as being on a group on WhatsApp where many people see each other's conversations. Instead, TeacherConnect is an information sharing platform that uses machine learning and a set of keywords to deliver relevant and valuable information to you on demand when you ask for it within WhatsApp. TeacherConnect will also give you access to support from our coaches and technical support team, all within WhatsApp.

2.1 Getting connected

There are two ways to connect on TeacherConnect:

Option 1 Message 'hi' to 0600 60 33 33.

Option 2 Click on the WhatsApp icon on any of our sites. Here you will find tons of useful content, news and updates from E³ and other DBE teams. Be sure to save the TeacherConnect number as a contact on your phone.

2.2 Using TeacherConnect

1. Accessing resources. Send the word 'hi' to the TeacherConnect number at any time of day or night to receive a list of available news and resources.

2. Message the word 'E³' to go straight to the latest E³ news and resources.

3. Message the word 'support' to contact our tech support team in case you are ever having trouble with any of our E³ tech systems.

4. Message the word "coaches" to reach one of our coaches who are there to support you with questions relating to Project-based Learning.

5. Message the word "PLC" to link through to our digital community of PBL teachers.

6. Message the word "projects" to go directly to the latest list of PBL projects in the E³ project library.

Session 3
The Teacher's Black Belt System

Tom Ryan, the designer of the new, more comprehensive Project-based Learning model, to which you were introduced in a previous module, is a retired academic from the UCT School of Business where he was the director of the MBA programme. For twenty years he has used the problem-based approach as a basis for the design and delivery of learning and development experiences. The questions many concerned educators are asking today revolve around how we are going to prepare our learners for the maze that is going to be the post-Covid-19 world, a world that is going to change significantly in terms of how we do things, how we learn, and how we educate. It is going to be accelerated by the Fourth Industrial Revolution (4IR) and the increasing role that technology would play - the metaphor of a maze really gives us a sense of what it might be like.

How do we enter this maze, knowing that we have many choices, that there are many dead ends, and that we have to somehow find our way through this maze. We suggest again that PBL is a way of achieving that.

Let's remember the "whys" of deepening the initial model used by E³ using the three-stage learner process, which starts off with Enquiry-based Learning, then moves on to Problem-based Learning, and finally to the design thinking, which involves designing and building prototypes.

How might this work? A final recap of the new PPBL model will show how the three stages integrate so many levels of cognitive development. Learners will be so engrossed in meaningful real-life activities that they will not realise how deeply and in how many diverse ways they are thinking.

Let's look at water pollution. An enquiry-based learning would start off by trying to understand the nature of water pollution. What is water pollution? How does it happen? There is general knowledge around water pollution and the mechanisms that cause it. Once we have that knowledge, we move on to Problem-based Learning and we look at a real world pollution problem, for example, it may be a rural community that is suffering from water pollution. We'd look at the causes and effects of water pollution within that community and then propose some solutions. Once we have a set of solutions, we then go in and select the best solution and then design and build an artifact that would help implement the solution. In this case, it might be a low cost water filter. In the last phase of PBL, we actually design, build and test a low cost water filter and see how well it works. This is a brief description of the nature of PBL.

What happens when learners learn from projects? Again, I am going to use the metaphor of a maze. You have a frustrated learner at the entrance of the maze, not knowing where or how or what is going to happen. In a PBL process, the first stage provides a learner with autonomy. It is a learner-centred process. It increases the voice and the choice of the learner in the learning process. Once the learner has a measure of autonomy, he or she can start inventing, making or experimenting with things. This process of inventing, making and experimenting increases their ability to think in terms of systems, improves their design thinking, and improves their computational thinking. As these levels of thinking improve, they increasingly develop the 21st century skills they need to develop a growth mindset, as well as an empathetic mindset.

And these three collectively lead to what we may call E³ readiness. That is the readiness for the world of work, the readiness for the world of entrepreneurship, and the readiness to continue their education. So, how might we implement this? The E³ PBL programme is designed to help you do this, to help you implement PBL in your classroom and other learning spaces, and to help you better prepare your learners for the post-Covid-19 maze.

We at E³ are motivated by a huge compelling goal: that every young South African must be gainfully employed as an entrepreneur, have a job, or pursue an educational journey after school.

This last session will be reflecting on agency and looking at the importance of our motto: 'If it is going to be, it is up to me!' Teachers need to believe in their power, to be the change agents for their learners' futures, to become entrepreneurials, even if they are not actual entrepreneurs:

4.1   What does it mean to be an entrepreneurial?

An entrepreneurial, like a millennial, is a noun. It is someone who says 'if it is going to be, it is up to me.' Entrepreneurials are people of the *search and discovery* generation. They have a mindset that drives their purpose as they look for that intersection between their own interests and abilities and that thing that will serve the needs of their fellow human beings. So what is it that makes up an entrepreneurial mindset?

Well, there are three main things. One, is agency. The second self-efficacy, and thirdly, solution-seeking. So let's start with agency. Agency means that I have purpose and that I am useful to others. To have agency and a sense of purpose, one must have a growth mindset, one must be intrinsically motivated, one must have an internal locus of control, one must be able to regulate one's emotions in the face of adversity, and one must have a high level of empathy.

We have looked in previous sections of this process of what it means to have a growth mindset, that state of mind where one is willing to listen to new information, change one's assumptions, change one's truths, and change one's behaviour patterns. Intrinsic motivation is where one is driven by the desire to do things from inside, not through reward and recognition. The internal locus of control is where one doesn't blame external elements for the things that are happening to one - where one has a sense that they can make a change and that they don't have to wait for others. The regulation of emotion is something entrepreneurs have.

They get up after failure, they shake themselves off, and they describe their experience in positive terminology rather than in failure language. And of course, that underlying element of empathy where you stand in another person's shoes and you see the world from their perspective - then you try to find a solution to their problem.

4.2   Self-efficacy

And so the second element of self-efficacy is one where I believe in myself and my abilities. Self-efficacy is an amazing quality that entrepreneurials have when they believe that they can do something, even if perhaps they don't have the skills to do it. They just go out and try. And what makes the self-efficacy possible is where entrepreneurials have had a taste of success. It is like that first time when the ball connects with the bat and you feel it flying out of the park and you know that you can do it, and even though you might fail a number of times again, you have tasted that success, and so you keep on trying.

Self-efficacy is also helped enormously by the exposure to socially relatable role models - when you can see yourself mirrored in someone else and you can see their success and you know that you can do what they can do. When entrepreneurials are surrounded by socially relatable role models, they are far more likely to develop self-efficacy. Positive support also helps to develop self-efficacy, which we all respond well to as teachers, coaches and parents.

Wherever someone is trying to do something, such as trying to get a ball onto a bat, there is generally someone cheering them on: a cheerleader, a coach, a teacher, a parent. These are the crucial support structures that help someone to develop self-efficacy. So agency, self-efficacy and finally, solution seeking.

4.3   Solution-seeking

People with an entrepreneurial mindset, even if they are not actual entrepreneurs, are solution seeking. They cannot help themselves. They are of that *search and discovery* generation which says 'if it is going to be, it is up to me.' *If there is a problem that I can see in front of me, I will find a solution.* The solution-seeking entrepreneurial follows a process of curiosity - they are endlessly curious. They see things in front of them and think *how did that happen? Why is that like that? How can I make it better?* They have a questioning mindset. They are continually probing and questioning to find that piece of information that they particularly need to solve that problem, and then they explore and find ways of prototyping and developing minimally viable products that can be successful.

Of course, they then reflect on the feedback that they received and then maybe even change their idea. They may even change their solution as they realise that there is maybe something else that will be better, and of course, they start all over again. They iterate over and over again, improving and improving until they find the solution.

And so in the process of Project-based Learning we're wanting our young learners to leave school with agency, self-efficacy and a solution seeking mindset. But not only do we want them to have that, we also want them to develop a whole series of tools in their toolbox; what we call competencies - those things that they'll reach for when they are faced with a particular dilemma.

The DBE has used the UNESCO model, the competency model to guide the competencies that will be embedded in Project-based Learning. E³ has taken these competencies and simplified them. The UNESCO competencies are globally acknowledged and they are fit for the 21st century and the 4th Industrial Revolution workplace. The E³ competencies distilled from the UNESCO competencies are the following: character (what is in my heart); thinking (what's in my head); and connection (our togetherness).

Character

Character is all about how one is as a citizen. How one is in one's circle of influence, how one is in one's community. It is about being curious, about looking out for those opportunities to help others, and of course, in the face of adversity, it is about being resilient.

Thinking

This is what is going on in your head. It is the ability to be creative and to see innovation and solutions. It is the ability to think critically, analyse and ask the question, *is this real or fake information? What insights can I add to this information that I am receiving? And how do I reason and make sense of what I am hearing?*

Connection

The third is connection, about the "we". It is about collaborating with others, listening to them, hearing their opinions, and taking what they have and using that information. It is about the ability to communicate effectively and being able to articulate one's own point of view while listening to others, and finally, that critical element of empathy. In the process of connection, we are able to see other people's point of view, to feel their emotions and to feel their pain - you need to be the change that you want to see in the world. You need to walk the talk and become this champion, this coach, this cheerleader and this socially relatable role model that learners see in front of them every day.

Learners need to see you displaying agency, self-efficacy, being solution seeking in your own class - you, their teacher with a strong character, being thoughtful and being collaborative - just like the wonderful role model we had in Nelson Mandela.

And so for the 13 years that learners are at school, and some of them in your class, they need to see a great, strong, resilient, curious, enthusiastic example before them every day. They need to see someone who is an entrepreneurial. They need to see someone who inspires them to study further, be a great employee or start their own enterprise.

Go out and teach them by using great activating teaching methodologies of Playful Project-based Learning to do and to be all of these things. Thuma mina - 'If it is going to be, it is up to me.'

GO TO ACTIVITY — SUMMATIVE ACTIVITY TOPIC 7

Institutiona-lisation

...of Active Learning Pedagogies
...to ensure local, provincial and national DBE structures support

School implementation

...ensuring teacher training & support & growth of tribe
...as well as engaging learners, and SMTs

Partnerships and stakeholder relationships

...to ensure that schools are hub of an eco-system supported by civil society, HEIs, NGOs and parents...

Topical Glossary

Topic 1	
Agency	Power, capacity, ability to do something – to bring something about – to be instrumental in what happens, etc.
Agility	Ability to move quickly and easily – can be physically or mentally
Entrepreneurials	Refers to people that may not necessarily run or own their own businesses but they think like an entrepreneur, i.e. they practice a solution-seeking mindset
JIT – just-in-time	A concept originated in the east where a manufacturer would not manufacture goods or parts in advance and stock them up; instead, they would manufacture them as and when needed.
Millennials	Baby Boomers were born between 1946 and 1964 Generation X was born between 1965 and 1979/80 Generation Y, or Millenials, were born between 1981 and 1994/6 Generation Z are the newest generation, born between 1997 and 2012/15
Reconstructivism	A belief that nothing can stay the same; that we need to reform all the time to adapt to an ever changing world.
Scaffolding of learning	A process in which teachers model or demonstrate how to solve a problem, and then step back, offering support as needed. The theory is that when students are given the support they need while learning something new, they stand a better chance of using that knowledge independently. It could also simply mean building on prior knowledge.
Teacher-centred	Refers to learning situations in which the teacher asserts control over the material that students study and the ways in which they study it—i.e., when, where, how, and at what pace they learn it.

Topic 2	
Baseline	Meaning where to start a process; the best starting point from which to build something; a baseline assessment would serve to assess where that starting point should be, etc.
Concurrent	Two or more things happening at the same time or simultaneously.
Contextual	Depending on the surrounding circumstances;
Growth mindset	People believe that their most basic abilities can be developed through dedication and hard work—brains and talent are just the starting point. This view creates a love of learning and a resilience that is essential for great accomplishment.
Institutionalisation	The action of establishing something as a convention or norm in an organization or culture.
Intrinsic	Belonging naturally to or being essential to someone or something.
Learner-centred	An approach that places the learner at the centre of the learning. This means that the learner or student is responsible for learning while the teacher is responsible for facilitating the learning
Literacies	A major difference between Multiliteracies and the conventional view of literacy is that in Multiliteracies perspective, literacy is not restricted to printed or written forms of language but instead, it involves multiple modes of representation, such as music, gestures, and pictures
Locus of control	Students with an internal locus of control might blame poor grades on their failure to study, whereas students with an external locus of control may blame an unfair teacher or test for their poor performance
Mandatory	Required by law or compulsory
NSLA	National Strategy For Learner Attainment (NSLA)
Resilience	The capacity to recover quickly from difficulties; toughness.
Self-efficacy	Refers to an individual's belief in his or her capacity to execute behaviours necessary to produce specific performance attainments. Self-efficacy reflects confidence in the ability to exert control over one's own motivation, behaviour, and social environment.
Verbatim	Copied, quoted, or translated in exactly the same words as were used originally

Topic 3	
Authentic	Describes something that is real or genuine and not counterfeit. … In addition to describing something real, the adjective authentic describes something reliable, based on fact, and believable.
CALP	Cognitive Academic Language Proficiency The language necessary for day to day living, including conversations with friends, informal interactions. The language necessary to understand and discuss content in the classroom.
Carte blanche	It means that the person is free to do or say whatever he or she pleases. … When used in the sense of giving someone free rein, you say the person has been given "carte blanche," and not "a carte blanche
Collaborate	To work jointly with others or together especially in an intellectual endeavor
Debrief	A series of questions about a completed mission or undertaking
Differentiate	Treating people or things taking their differences into account; accommodating the differences among people.
Discourse	A discussion about a topic either in writing or face to face. An example of discourse is a professor meeting with a student to discuss a book. Discourse is defined as to talk about a subject.
Dynamic	Characterized by constant change, activity, or progress. "a dynamic economy"
Homogeneous	Of the same kind; alike
Hover	Looking over someone or something; being there all the time – watching.
Inclusive practice	Teaching in a way that: respects the diversity of students. … ensures different students' learning needs and preferences are met, regardless of their backgrounds, learning styles or abilities
Iterative	The repetition of a process in order to generate an outcome. The sequence will approach some end point or end value. Each repetition of the process is a single iteration, and the outcome of each iteration is then the starting point of the next iteration.
Metaphor	Using one thing to refer to another thing – to improve the understanding – e.g. She is a rock. In other words, we can rely on her; she is strong, etc.
Rigorous	Extremely thorough and careful.
Simulation	Imitation of a situation or process, especially for learning purposes.

Synthesise	The combination of components or elements to form a connected whole.

Topic 4

AI	The ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings.
Blockchain	A public electronic space built around a system that can be openly shared among disparate (from different places) users to create an unchangeable record of transactions, each time-stamped and linked to the previous one. … Each digital record or transaction in the electronic ledger is called a block.
Hone	To sharpen; refine; polish, etc.
Model	A thing used as an example to follow or imitate.
Organic	Describes when something happens naturally; not engineered or orchestrated; left to develop on its own, etc.
PLC	Professional learning communities (PLCs) tend to serve two broad purposes: (1) improving the skills and knowledge of educators through collaborative study, expertise exchange, and professional dialogue, and (2) improving the educational aspirations, achievement, and attainment of students through stronger leadership and …

Topic 5

Advocates	Promote or recommend a specific policy, programme, etc.
Continuum	An arrangement of descriptions, for example there are several different levels of heat between very cold and very warm
Trialling	Testing of something
Manipulatives	Any concrete objects that can be used to build or represent something
Mirrors	When your behaviour reflects that of another person
Inter-disciplinary	Relates to more than one branch of knowledge (subject)
Thinking tools	Diagrams and technologies to assist with creative thinking
Open source	Some computer applications are based on a language that allows anyone to alter it to suit their own needs - it is also free to anyone

Black Belt	The top level a karate (or similar) participant can reach - like a qualification in Karate
Stripes and badges	You earn various stripes and badges as you progress through the training programme
Daunting	Seems difficult and intimidating
Peers	Those on your level
Attributes	Characteristics
Vivid	Very clear
Mechanistically	Like a robot
Gangly	Tall and thin
Taxonomy	The science of classification of things or systems
Expansive	Covering a wide area
Robust	Strong and in good shape
Cognitive	To do with intellectual activity
Multisensory	Involving or using more than one of the five senses
Developmental	To do with the development/ growth of someone
Legacy	Something of value left for those that come after you - next generations
SWOT	Refers to a tool that organisations use to make plans - they identify their Strengths, Weaknesses, Opportunities and Threats =S.W.O.T
Socially relatable role models	A role model that you can connect with - not a total stranger to your society or community
Fireside chat	Very informal chat - storytelling
Viable	Can be done
Dragon's Den.	Name of a British TV show where entrepreneurs explain their business ideas to a panel of experts

STIs	Sexually Transmitted Infections
Mitigating	Making something less bad or severe - make more acceptable

Topic 6

Protocols	Set of rules
Mentee	The one that is being mentored/ coached
Probing	Inquiring or searching for answers, etc.
Demand-driven	Exists because it is in demand/ needed by others
Embedded	Deeply rooted inside of a person or something
Infusing	To fill something with other things - mixing with
Capital	The value that someone or an organisation has - all the skills, knowledge and expertise
Ecosystems	All those things living/present in a specific space that interacts with each other to make progress possible
Custodian	Someone that looks after something
Rigorous	Very thorough (taking care to be accurate and proper)
A far cry	Very different from

Topic 7

Phenomenon	Something that is observed
Autonomy	Control
Indispensable	Cannot do without
Metaphor of a maze	Like a puzzle of paths and directions to follow to get to a solution
Dead ends	When you cannot make further progress

Engrossed	Takes up all the attention
Artifact	An object made by a human being -usually of cultural or historical significance
Computational	Using analytical processes to solve problems
Dilemma	A situation where a difficult choice has to be made between two or more choices
Distilled	Without any impurities - left with only the important elements
Adversity	Difficult or unpleasant circumstances