JET EDUCATION SERVICES
THINK EDUCATION. THINK JET.



PRESENTATION

A Case Study of an AI-Powered Mathematics Pilot Programme.

E-Learning Africa Conference, Accra June 2026

Introduction

JET Education Services (JET), in collaboration with **a Finnish organisation (Eduten)**, is currently implementing the EdTech solution targeting learning backlogs in schools at the Grades 3, 4, 5, 6 & 7 (9-13 year olds)

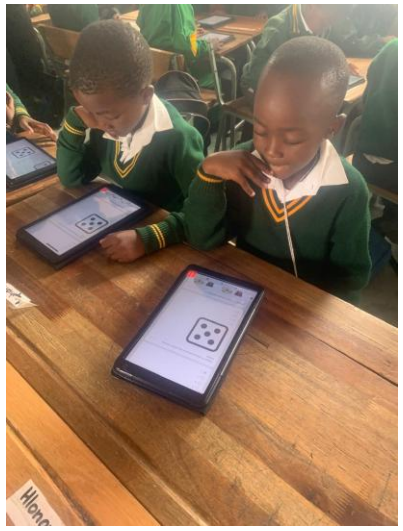
JET has been responsible for implementing the project and all advocacy and communication while **Eduten** has provided the AI Maths programme and the technical support.

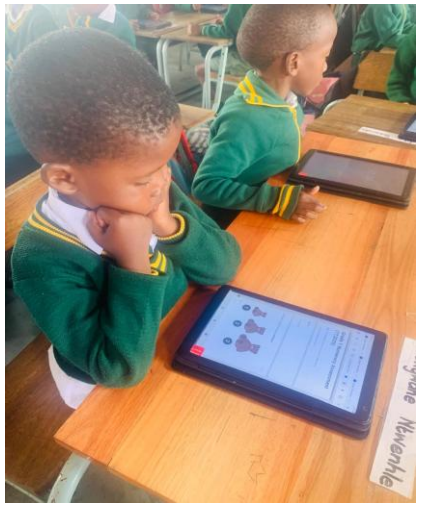
The programme is currently being implemented in resource-constrained rural Primary schools in KwaZulu-Natal (KZN), Northern Cape (NC), Gauteng, Limpopo (LP), and the Eastern Cape (EC).

The presentation outlines the implementation from inception to impact report.









THEORY of CHANGE

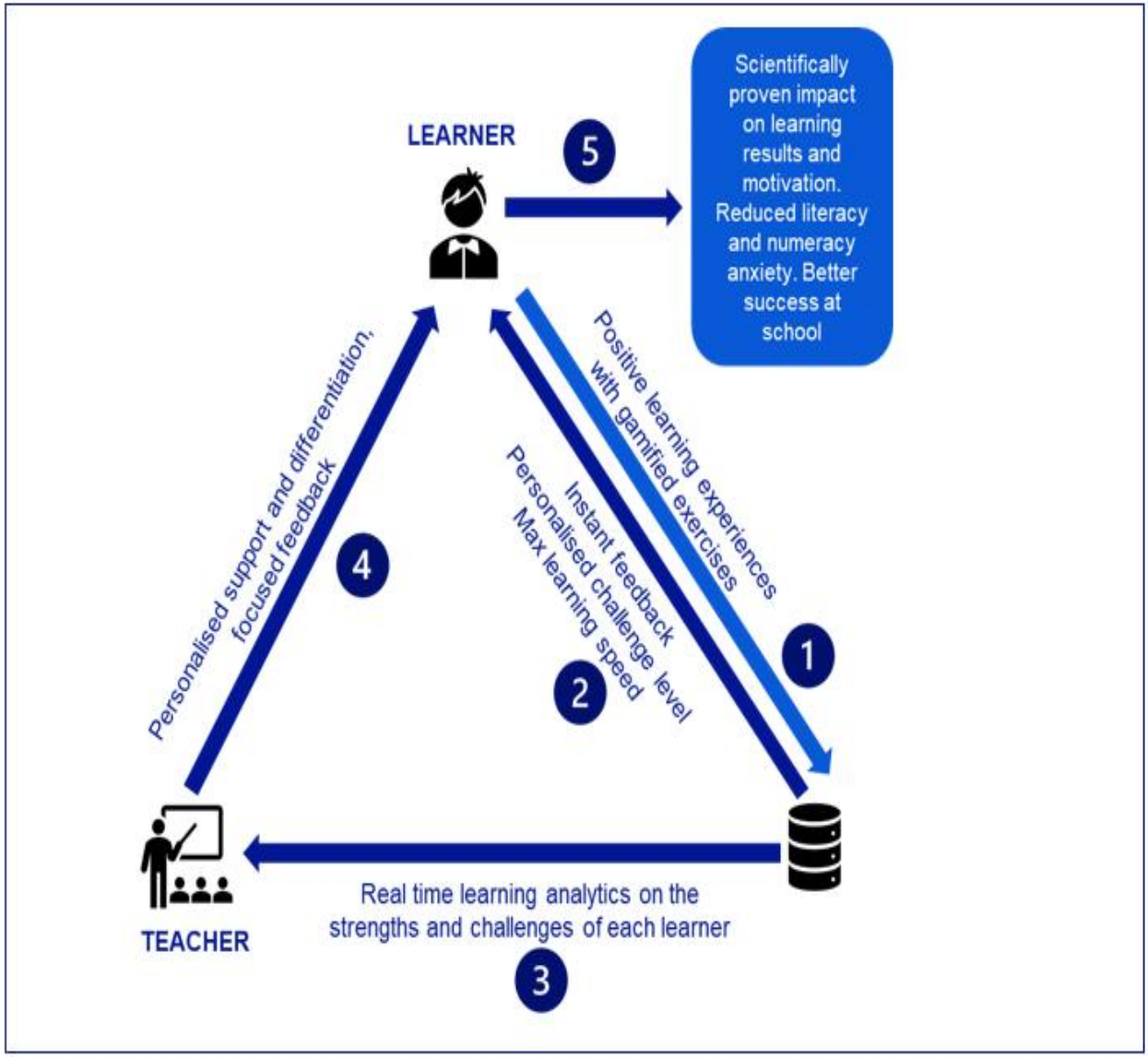
The **theory of change** is built on the **assumption** that **innovative, engaging and personalized technology**, combined with **teacher capacity** building and strong monitoring and data use, can **help learners master core concepts** and **address the learning backlog** crisis.

IF **school leadership** informed on how to support teachers with the implementation of the AI Maths programme, **THEN** school leadership will be **capacitated to support teachers** to deliver quality blended education.

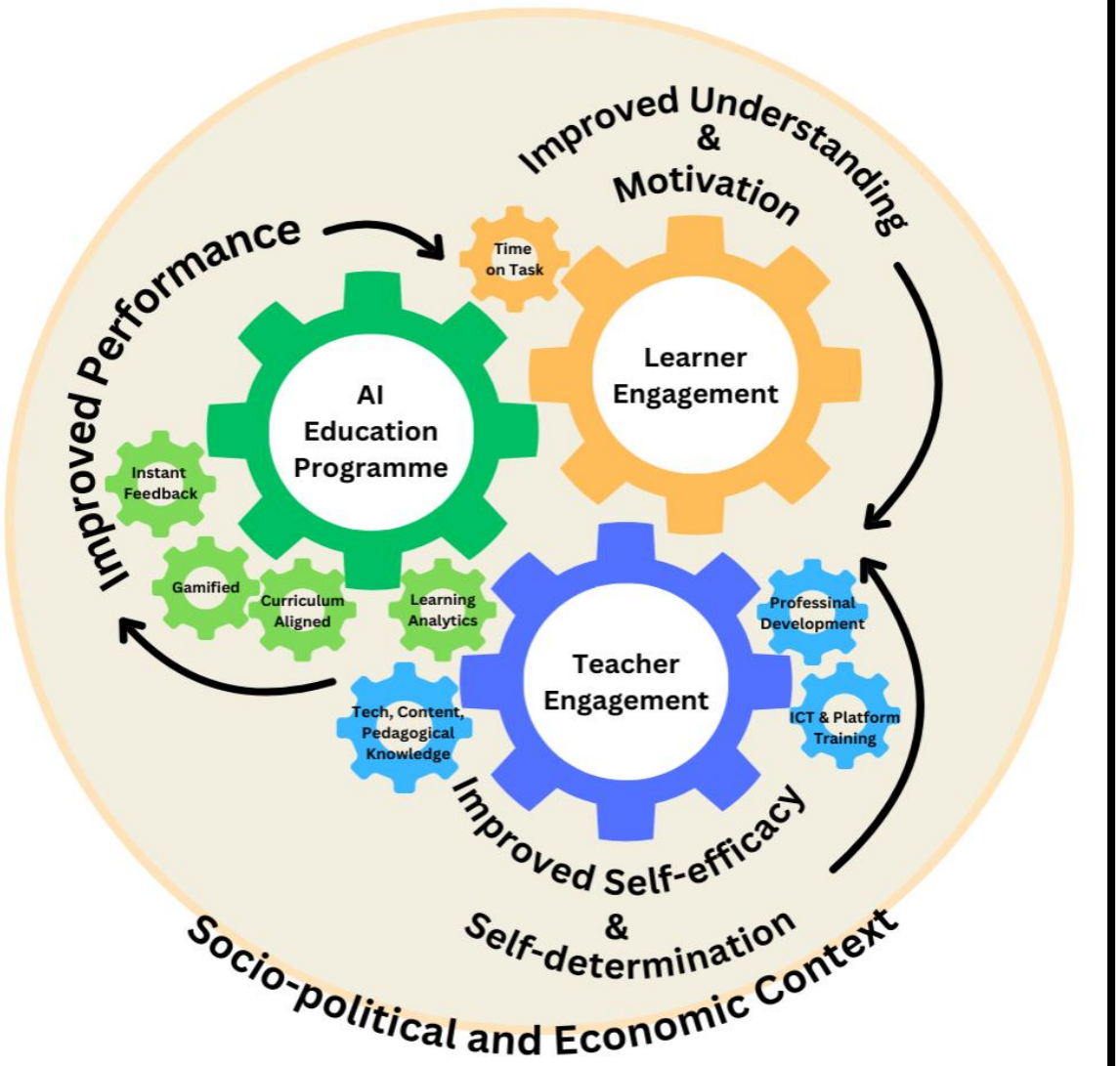
IF **teachers receive training, mentoring and support** in how to integrate the AI Maths programme into their lesson planning, **THEN** they will **see the value of AI Maths** to their teaching and learning.

IF the **teacher's pedagogical content knowledge** is enhanced through training, support and the itegration of the AI Maths material and resources, **THEN** the **teachers will adopt a blended approach** to cultivate holistic and differentiated learning environment

And **IF** **learners are provided with opportunities** to use the AI Maths programme and provided with guidance and support from their teachers, **THEN** learners will receive quality differentiated education which unlocks and **develops their full potential** in Maths.



A Human-Centred Theoretical Framework for the integration of AI in Mathematics Education



The proposed **theoretical framework** asserts that the successful integration of AI technologies in educational settings necessitates a **human-centred approach** that prioritises both teacher and learner engagement.

Drawing upon the work of scholars like Bandura (1997) on **self-efficacy**, Ryan and Deci (2000) on **self-determination** theory, and Vygotsky (1978) on sociocultural learning, this framework emphasizes the interconnectedness of key factors that influence the effectiveness of AI-driven interventions, **recognizing the crucial role of teacher agency and the social context of learning in fostering learner maths knowledge and understanding.**

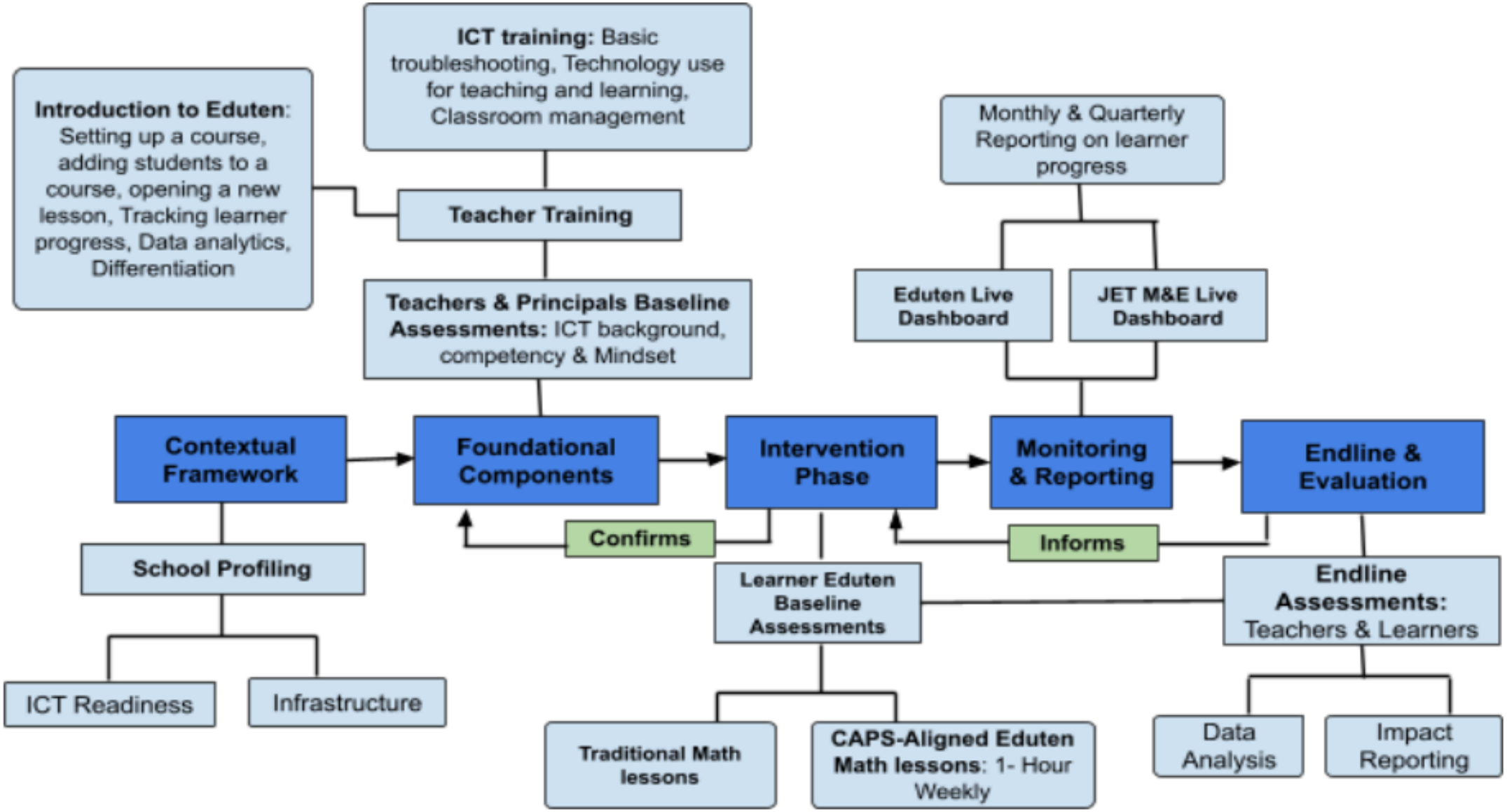
For Context
- School Profiles and contextual factors

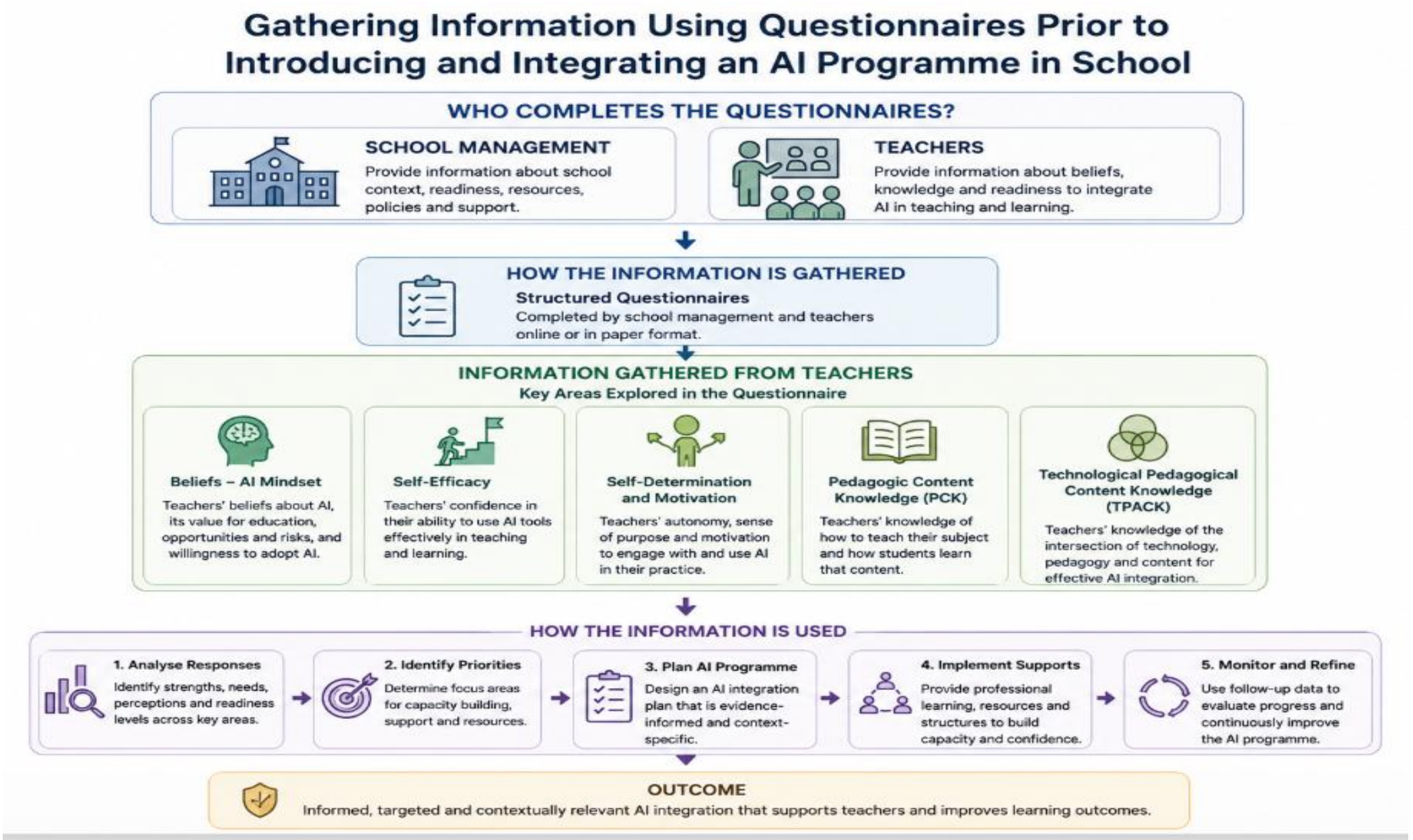
For Teachers:
- Beliefs - Mindset, Self-Efficacy, Self-Determination and Motivation
- Pedagogic Content Knowledge
- Technological Pedagogical Content Knowledge

For Learners:
- Engagement - fun, relevant and easy to use
- Motivation
- Performance
- Reinforcement

AI Programme:
- Contextualised
- Ease of use
- Aligned to Curriculum
- Relevant to teaching and learning
- Inform the teaching and learning

Design and Implementation




Gathering Information Using Questionnaires Prior to Introducing and Integrating an AI Programme in School
WHO COMPLETES THE QUESTIONNAIRES?
SCHOOL MANAGEMENT
Provide information about school context, readiness, resources, policies and support.
TEACHERS
Provide information about beliefs, knowledge and readiness to integrate AI in teaching and learning.
HOW THE INFORMATION IS GATHERED
Structured Questionnaires
Completed by school management and teachers online or in paper format.
INFORMATION GATHERED FROM TEACHERS
Key Areas Explored in the Questionnaire
Beliefs – AI Mindset
Teachers' beliefs about AI, its value for education, opportunities and risks, and willingness to adopt AI.
Self-Efficacy
Teachers' confidence in their ability to use AI tools effectively in teaching and learning.
Self-Determination and Motivation
Teachers' autonomy, sense of purpose and motivation to engage with and use AI in their practice.
Pedagogic Content Knowledge (PCK)
Teachers' knowledge of how to teach their subject and how students learn that content.
Technological Pedagogical Content Knowledge (TPACK)
Teachers' knowledge of the intersection of technology, pedagogy and content for effective AI integration.
HOW THE INFORMATION IS USED
1. Analyse Responses
Identify strengths, needs, perceptions and readiness levels across key areas.
2. Identify Priorities
Determine focus areas for capacity building, support and resources.
3. Plan AI Programme
Design an AI integration plan that is evidence-informed and context-specific.
4. Implement Supports
Provide professional learning, resources and structures to build capacity and confidence.
5. Monitor and Refine
Use follow-up data to evaluate progress and continuously improve the AI programme.
OUTCOME
Informed, targeted and contextually relevant AI integration that supports teachers and improves learning outcomes.

School Profile and Needs Assessment

Focus Area	Question	Response
WifiSchool Profile	School Name	
	Primary/Secondary	
	School Address	
	Principal and Deputy's Names	
	Contact Details	
	Number of Teachers	
	Number of Learners	
	Dedicated ICT classroom	Yes/No
	Number of Working ICT Devices	
	WiFi Connectivity	Good/Poor/None
	Average Class Size	
Teacher Profile	Level of Qualifications	Diploma/Bachelors/Post Grad
	Years of Teaching Experience	0–5/6–10/11–20/21+ years
	Level of ICT Competency	Basic/Intermediate/Advanced
Learner Profile	Home Language	
	Travel Distance home to school	0–5km/6–10km/11–20 km/21km+
	Mode of transport	Walk/School Bus/Taxi
	Learner Access to Technology at Home	
	Barriers to Learning	Transportation/Hunger/Lack of Support/Health Issues/Language Barriers/Societal issues
Community Profile	Community Description	Rural/Urban/Peri-Urban
	Major Economic Activities	Employment statistics
	Access to Infrastructure	Electricity/Water & Sanitation/Internet Connectivity
	Parental/Guardian Involvement	Very Active/Occasionally Active/ Rarely Involved/Not Involved
Needs Assessment	Top 3 School challenges	
	Top 3 Community challenges	
	Existing Partnerships/Support Programmes	
	Suggestions for Key areas requiring support	

Anticipates Challenges Early: Identifies potential risks and barriers before implementation, allowing for proactive strategies.

Promotes Stakeholder Buy-In: Involving teachers, parents, and community leaders resulting in smoother adoption.

Aligns with Broader Educational Goals: Helps integrate the AI initiative into existing school improvement plans and national curriculum standards.

Ensures Contextual Relevance: Helps tailor the AI programme to meet the specific needs, resources, and realities of the school and its community.

Identifies Infrastructure Gaps: Assesses access to essential technology like electricity, internet connectivity, and devices.

Evaluates Teacher Readiness: Determines teachers' ICT skills, self-efficacy and training needs for successful integration of the AI programme.

Facilitates Targeted Support: Pinpoints specific areas (training, resources, infrastructure) where additional investment is needed.

Highlights Learner Needs and Barriers: Reveals socio-economic, linguistic or learning challenges that could impact AI programme adoption.

Supports Equity and Inclusion: Ensures that marginalized or disadvantaged groups are considered in programme design and implementation.

Enhances Sustainability: Builds a strong foundation for long-term success by understanding and planning for the local context.

Examples of Questionnaires and Surveys – Teacher ICT Readiness

- Before implementing any Edtech programme, it is essential to assess teachers' existing ICT skills to tailor support effectively
- Pinpoint areas of support and provide training prior to implementation
- Teachers' digital competencies vary widely, especially in resource-constrained settings. Knowing where each teacher stands ensures the provide the necessary support which helps reduce anxiety around using ICT in their classroom

Teacher Readiness in Integrating Technology in the Classroom

Thank you for participating in our survey. Your responses are confidential, and we do not collect any personally identifiable information. Your individual responses will be kept strictly confidential and used for research purposes only. Please respond to each question using the provided scale.

Email *

Valid email address

This form is collecting email addresses. Change settings

1. What are your initial thoughts or feelings about integrating technology into your teaching practices? *

- Very Positive
- Positive
- Neutral
- Not helpful
- Very unhelpful

6. Have you used digital technology devices like tablets as teaching aids to teach mathematics? *

- All the time
- Yes
- Neutral
- Occasionally
- Not at All

7. Have you been exposed to any digital learning platforms? *

- Many
- More than a Few
- Neutral
- Few
- Not at All

Examples of Questionnaires and Surveys - Mindset

Using Carol Dweck's psychological theory on Mindsets – provide workshops for teachers on Mindset

- Highlights to the teachers their mindset interpret and perceive the abilities of their learners
- Fixed Mindset (ability is fixed and reluctance to embrace new strategies)
- Growth Mindset (Embrace challenges – ability can be developed through effort and learning)

Type of Statement and Category	Strongly Agree	Agree	Disagree	Strongly Disagree
1. Your intelligence is something very basic about you that you can't change very much. (ability mindset – fixed)	0	1	2	3
2. No matter how much intelligence you have, you can always change it quite a bit. (ability mindset – growth)	3	2	1	0
3. You can always substantially change how intelligent you are. (ability mindset – growth)	3	2	1	0
4. You are a certain kind of person, and there is not much that can be done to really change that. (personality/character mindset – fixed)	0	1	2	3
5. You can always change basic things about the kind of person you are. (personality/character mindset – growth)	3	2	1	0
6. Music talent can be learned by anyone. (ability mindset – growth)	3	2	1	0
7. Only a few people will be truly good at sports – you have to be "born with it. (ability mindset – fixed)	0	1	2	3
8. Math is much easier to learn if you are male or maybe come from a culture who values math. (ability mindset – fixed)	0	1	2	3
9. The harder you work at something, the better you will be at it. (ability mindset – growth)	3	2	1	0
10. No matter what kind of person you are, you can always change substantially. (personality/character mindset – growth)	3	2	1	0
11. Trying new things is stressful for me and I avoid it. (ability mindset – fixed)	0	1	2	3
12. Some people are good and kind, and some are not – it's not often that people change. (personality/character mindset – fixed)	0	1	2	3
13. I appreciate when parents, coaches, teachers give me feedback about my performance. (ability mindset –growth)	3	2	1	0
14. I often get angry when I get feedback about my performance. (ability mindset – fixed)	0	1	2	3
15. All human beings without a brain injury or birth defect are capable of the same amount of learning. (ability mindset – growth)	3	2	1	0
16. You can learn new things, but you can't really change how intelligent you are. (ability mindset – fixed)	0	1	2	3
17. You can do things differently, but the important parts of who you are can't really be changed. (personality/character mindset – fixed)	0	1	2	3
18. Human beings are basically good, but sometimes make terrible decisions. (personality/character mindset –growth)	3	2	1	0
19. An important reason why I do my school work is that I like to learn new things. (ability mindset – growth)	3	2	1	0
20. Truly smart people do not need to try hard. (ability mindset – fixed)	0	1	2	3

Scores of each of the participants

1 = 45 Strong Growth Mindset
2 = 45 Strong Growth Mindset
3 = 33 Strong Fixed Mindset
4 = 40 Growth Mindset with some Fixed ideas
5 = 53 Strong Growth Mindset

6 = 59 Strong Growth Mindset

7 = 44 Growth Mindset with some Fixed ideas
8 = 44 Growth Mindset with some Fixed ideas

AI-Mindset
GAAIS – General Attitude to Artificial Intelligence Systems

- Helps to understand teachers' views on AI and an insight into how it might influence their levels of anxiety or resistance or over-enthusiasm

Number	Item	SDA 1	DA 2	Nei 3	A 4	SA 5
i1	For routine transactions, I would rather interact with an artificially intelligent system than with a human					
i2	Artificial intelligence can provide new economic opportunities for this country					
i3	Organisations use artificial intelligence unethically					
i4	Artificially intelligent systems can help people feel happier					
i5	I am impressed by what artificial intelligence can do					
i6	I think artificially intelligent systems make many errors					
i7	I am interested in using artificially intelligent systems in my daily life					
i8	I find artificial intelligence sinister					
i9	Artificial intelligence might take control of people					
i10	I think artificial intelligence is dangerous					

Number	Item	SDA 1	DA 2	Nei 3	A 4	SA 5
i11	Artificial intelligence can have positive impacts on people's wellbeing					
i12	Artificial intelligence is exciting					
i13	An artificially intelligent agent would be better than an employee in many routine jobs					
i14	There are many beneficial applications of artificial intelligence					
i15	I shiver with discomfort when I think about future uses of Artificial Intelligence					
i16	Artificially intelligent systems can perform better than humans					
i17	Much of society will benefit from a future full of Artificial Intelligence					
i18	I would like to use Artificial Intelligence in my own job					
i19	People like me will suffer if artificial intelligence is used more and more					
i20	Artificial intelligence is used to spy on people					

Examples of Questionnaires and Surveys - Self Efficacy

Teacher self-efficacy reflects their belief in their ability and for AI Maths, their belief in being able to successfully integrate technology and adapt teaching methods – provide support on pedagogy.

Part 1: Instructional Self-Efficacy (10 minutes)

Question		Response				
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	I can effectively adapt my teaching methods to meet the diverse needs of my students.	1	2	3	4	5
2	I am confident in designing engaging and interactive lessons that promote active learning.	1	2	3	4	5
3	I can readily integrate technology into my classroom to enhance student learning.	1	2	3	4	5
4	I am skilled at assessing student progress and adjusting my teaching accordingly.	1	2	3	4	5
5	I am comfortable and confident using a variety of instructional strategies, such as differentiated instruction, cooperative learning, and project-based learning.	1	2	3	4	5
6	I can effectively differentiate instruction to meet the needs of struggling and advanced students.	1	2	3	4	5
7	I am skilled at providing clear and concise explanations of complex concepts.	1	2	3	4	5
8	I can foster a learning environment that encourages curiosity and questioning.	1	2	3	4	5
9	I am confident in my ability to motivate students and help them reach their full potential.	1	2	3	4	5
10	I can effectively address challenges and disruptions in the classroom without losing my composure.	1	2	3	4	5

Identifying levels of self-efficacy helps support teacher professional development that builds confidence and reduces resistance to change.

High self-efficacy is linked to perseverance, resilience, and commitment to continuous learning and embracing new approaches

Scoring: (Each item scored 1-5)

Score of 10-50 = Needs improvement in instructional practices.
Score of 51-70 = Competent in most instructional areas.
Score of 71-90 = Highly effective and confident in instruction.
Score of 151-200 = Highly effective and confident in classroom management

- Part 2: Classroom Management Self-Efficacy (10 minutes)

Question		Response				
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
11	I can establish and maintain clear classroom rules and routines.	1	2	3	4	5
12	I am confident in addressing disruptive behaviour effectively and efficiently.	1	2	3	4	5
13	I can create a positive and supportive classroom environment where students feel safe and respected.	1	2	3	4	5
14	I am skilled at building and maintaining positive relationships with students.	1	2	3	4	5
15	I can effectively deal with conflict and disagreements between students.	1	2	3	4	5
16	I am comfortable communicating with parents and guardians about student behaviour and performance.	1	2	3	4	5
17	I can effectively manage student emotions and create a calm and focused learning environment.	1	2	3	4	5
18	I am confident in my ability to handle unexpected challenges and disruptions in the classroom.	1	2	3	4	5
19	I can adapt my classroom management strategies to meet the needs of different groups of students.	1	2	3	4	5
20	I am optimistic that I can create a classroom where all students feel engaged and motivated to learn.	1	2	3	4	5

Training: School Management and Teachers

- **Programme Awareness Sessions (Q&A)**

1. Local Education Authority
2. Principals and
3. Teachers





- **Training Workshops**

1. Training Videos (1 hour)
2. Face to Face (90 Minutes)
3. Remote (1 hour)

- **Support**

1. Identify a “Champion Teacher”
2. Set-up WhatsApp Group – general information

a. Open lines of communication (phone, email)
b. Provide “refresher” infographic sent via WhatsApp

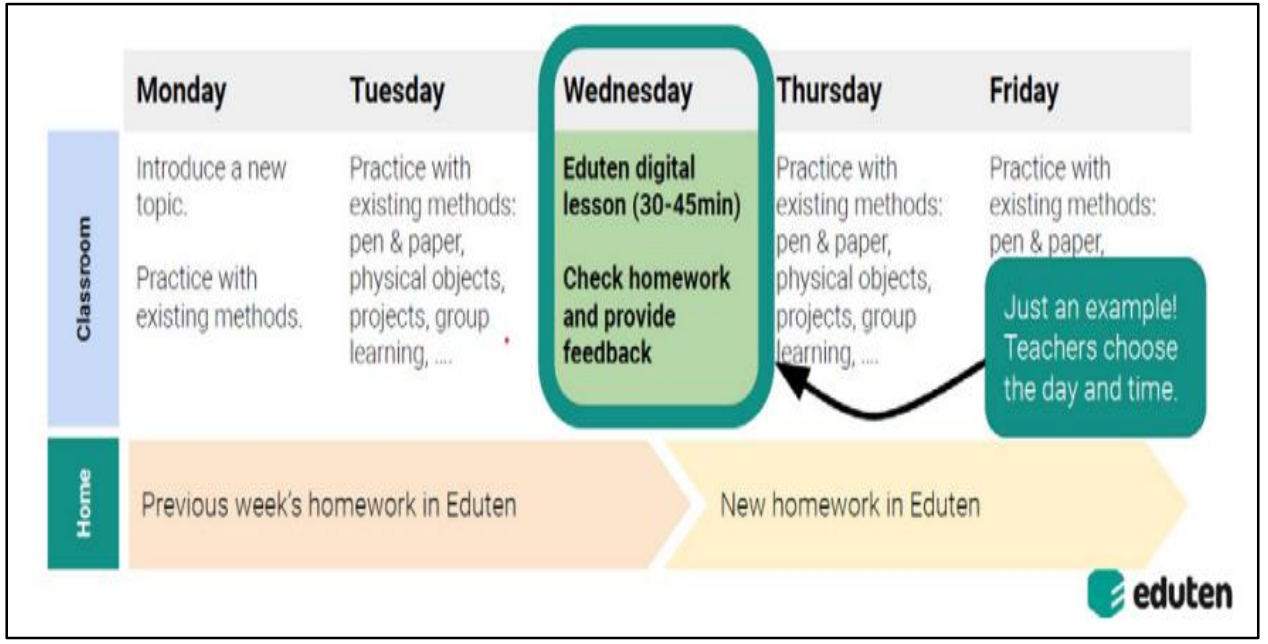


- **Monitoring and Evaluation**

1. Pre-intervention interviews with teachers and management
2. Quarterly workshops – training and feedback
3. Post-intervention interviews with teachers and management

Delivery and Dosage

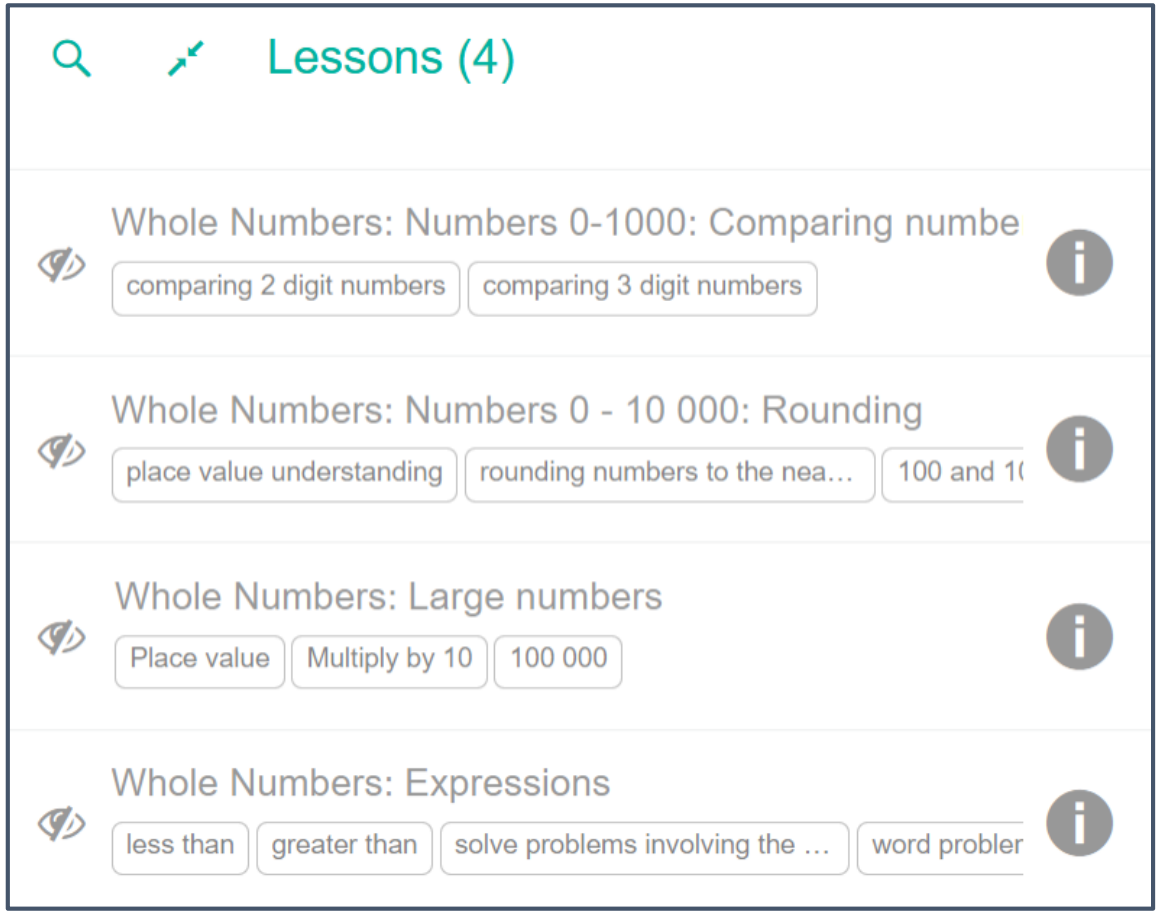
- 5 facilitators each supporting 4 schools on a rotational basis at least once a week
- Eduten sessions timetabled once a week in each school with access to the school IT Lab/classroom and devices
  Teachers participate in the eMpela e-Learning programme – self-paced
- Daily sessions across a cluster of 20 schools
- 5 days per week (equates to at least 1 session per child per week for maths)
- Eduten: One 45-60 minute session per week for maths
  eMpela: Self-paced session per week for Maths (30-60 minutes)
- Eduten: All Gr4 learners across the selected schools (est. +/- 3500 Gr4 learners)
  eMpela: All Gr4 maths teachers across the selected schools (est. +/- 60 Gr4 maths teachers
- Monitor and evaluate the progress and impact of the Eduten programme
- Online assessments to track performance



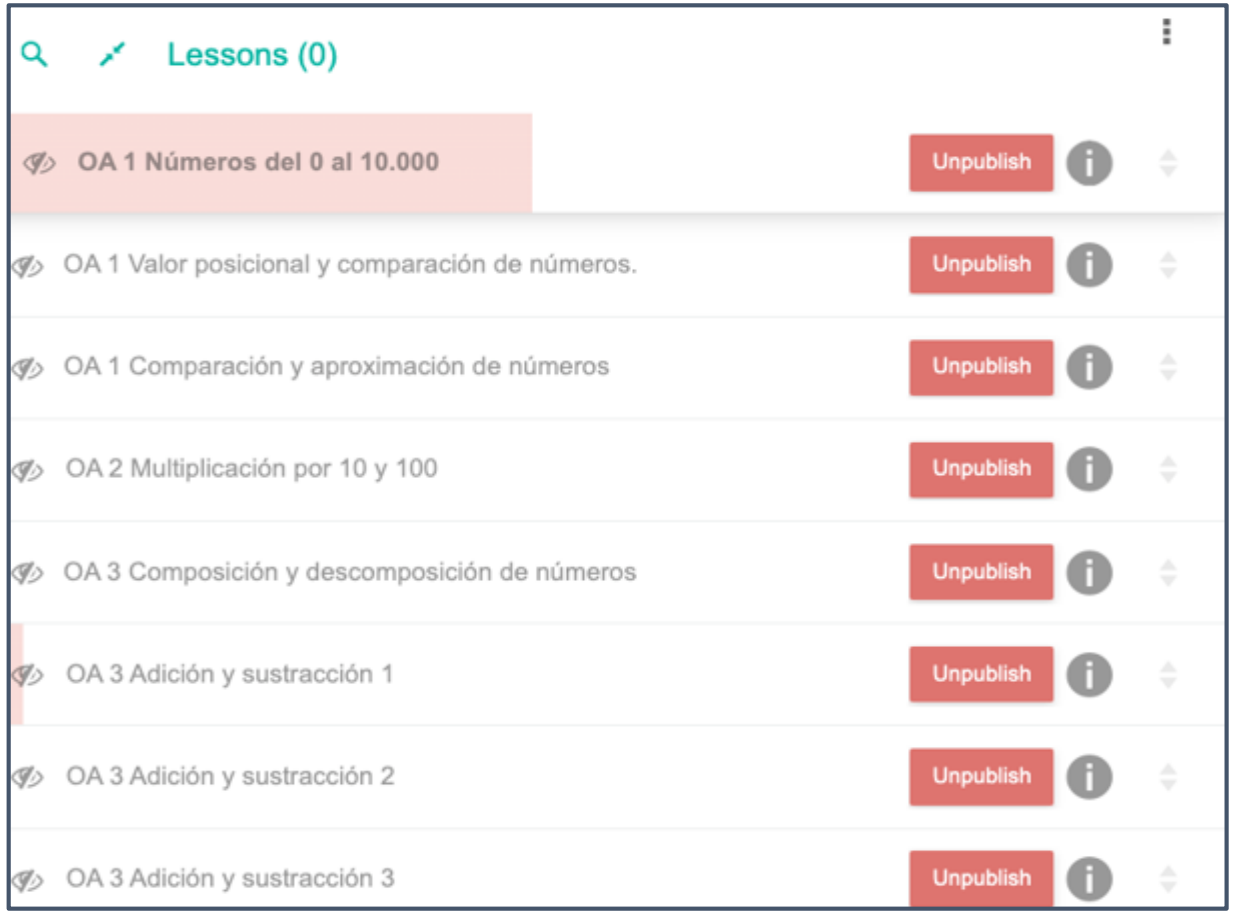


Aligned to the South African Context and Curriculum (CAPS)

CAPS -South Africa



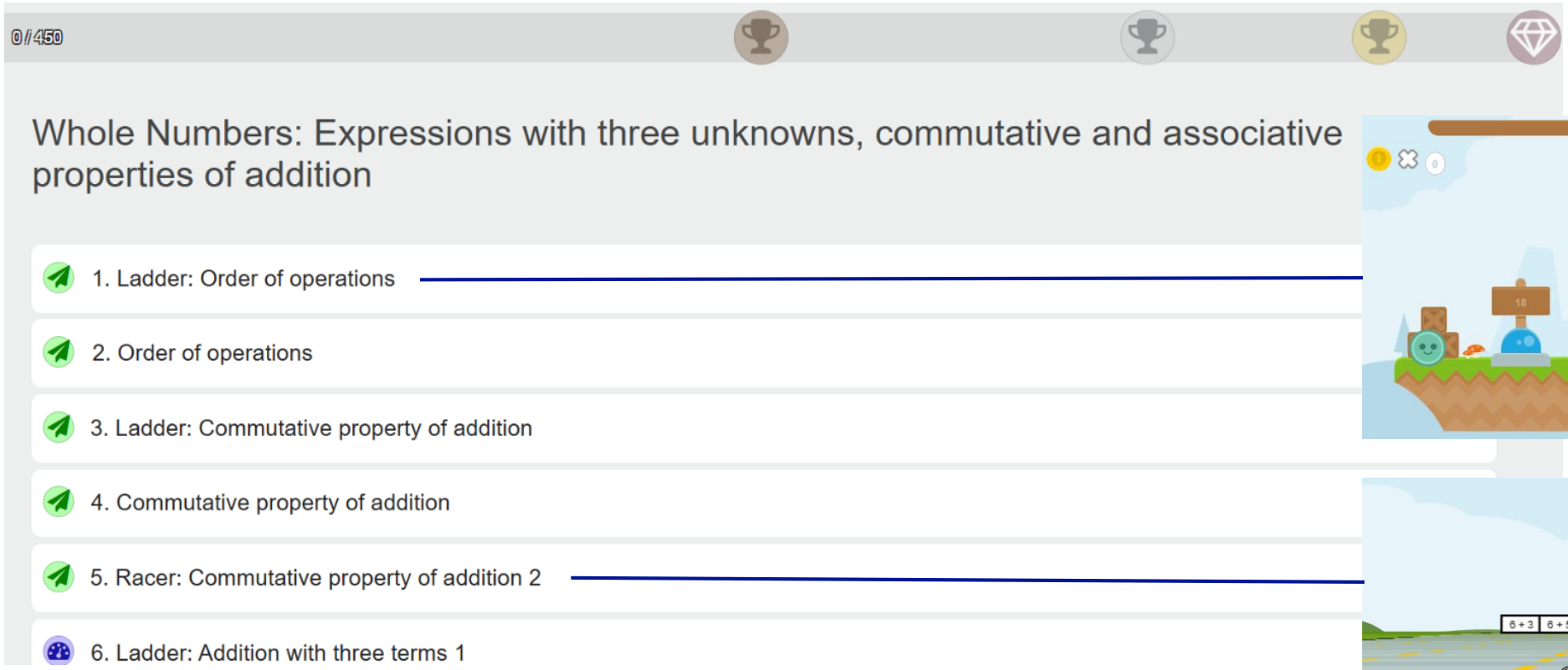
National Curriculum - Chile

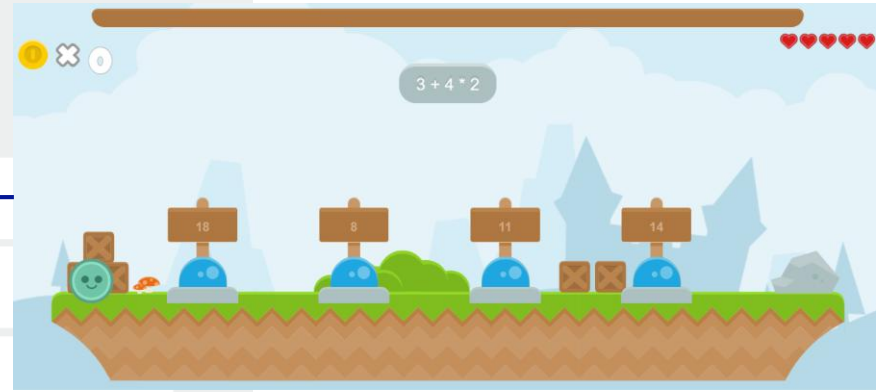


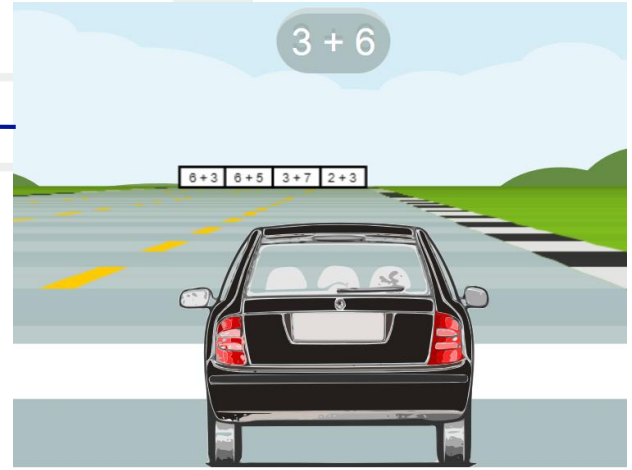
AI Maths programme aligns seamlessly with any curriculum worldwide, has been adapted for use in over 50 countries

A Gamified AI-learning Platform that provides scientifically proven improvements in learning outcomes

Learners: The AI Maths programme incorporates fun, interactive exercises to increase engagement. Learners earn rewards and given challenges to boost motivation.







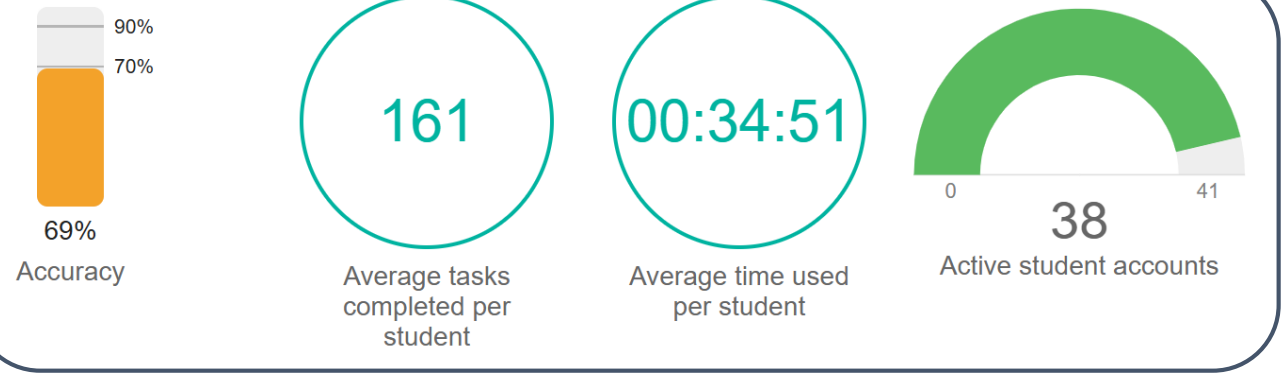


Bronze	50%	Silver	75%
Gold	90%	Diamond	100%

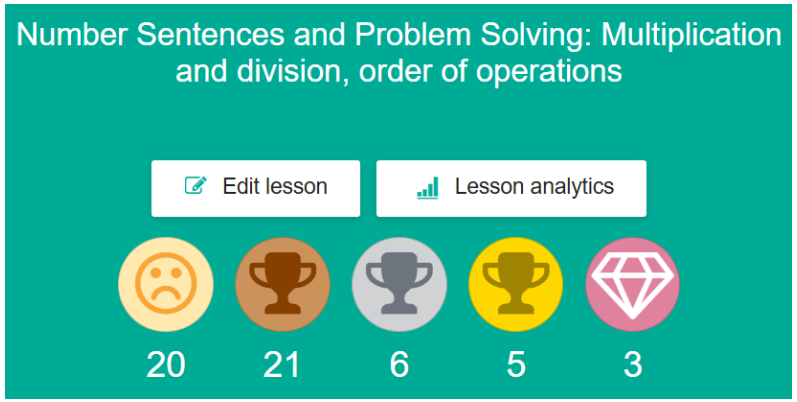
A Gamified AI-learning Platform that provides scientifically proven improvements in learning outcomes

Teachers: Use learning analytics to track student progress and enables differentiated instruction

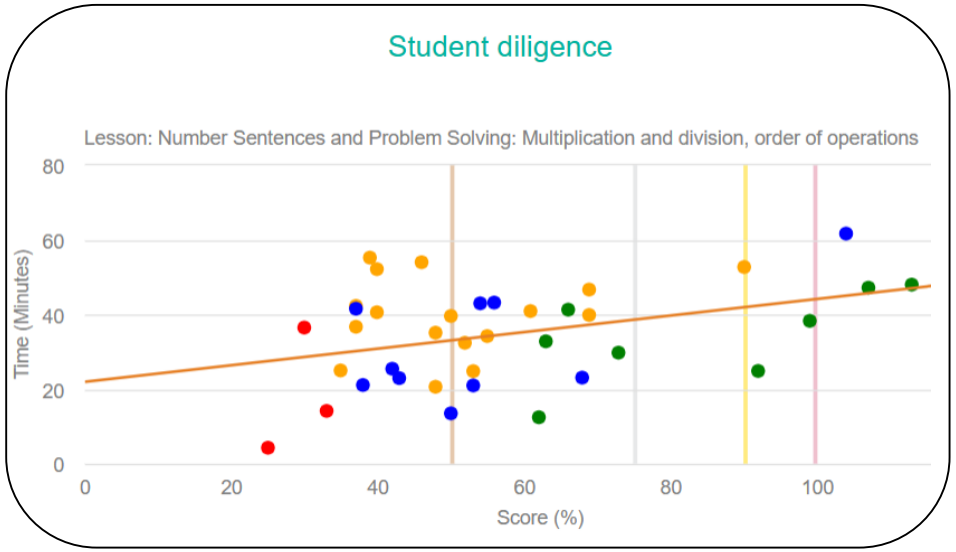
Lesson Progress



Student Progress



Student diligence



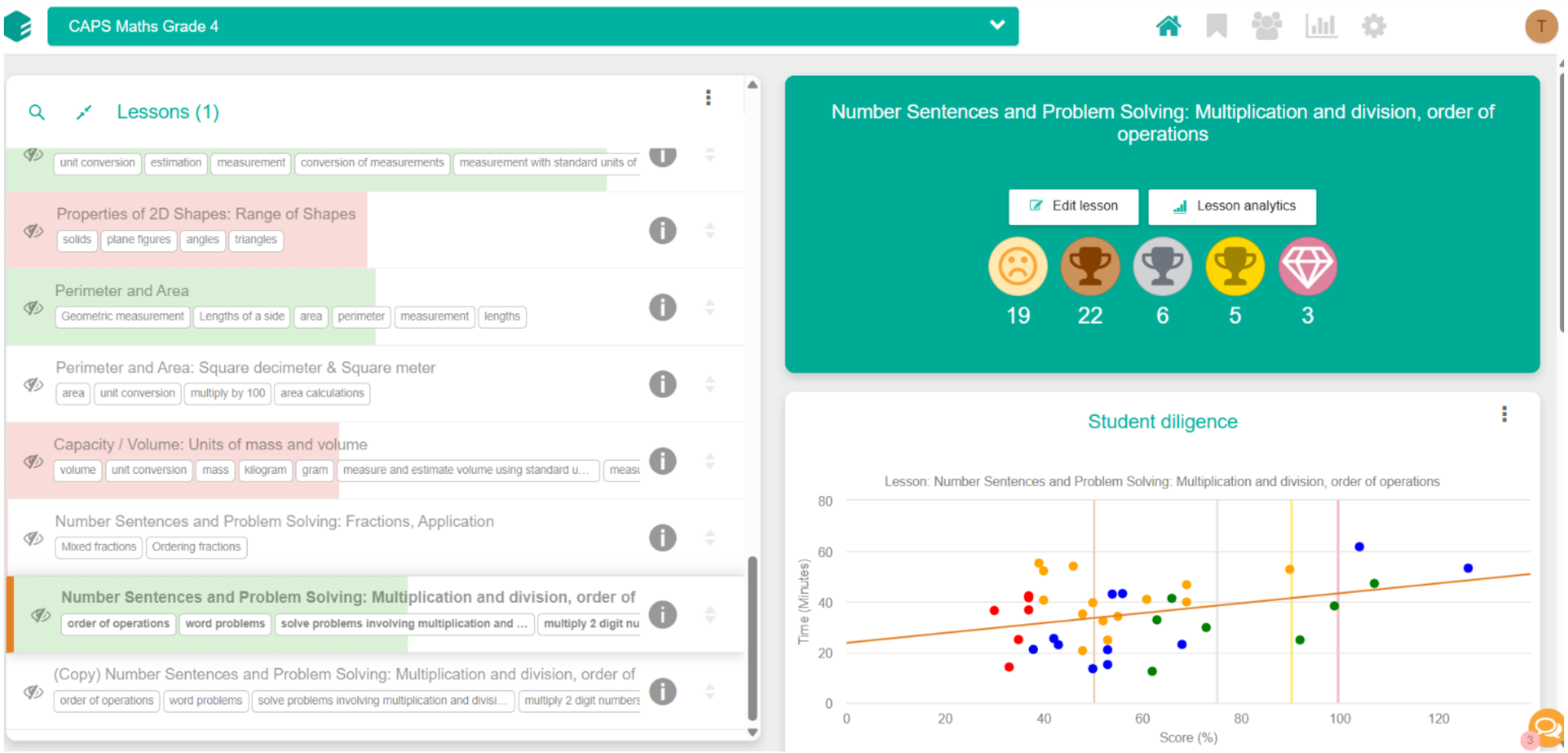
Low activity | Might need guidance | Good performance | Excellent performance

Student Skills



Needs practise | Moderate skills | Excellent skills

DASHBOARD (Data used by Teachers for Classroom Teaching and Learning)







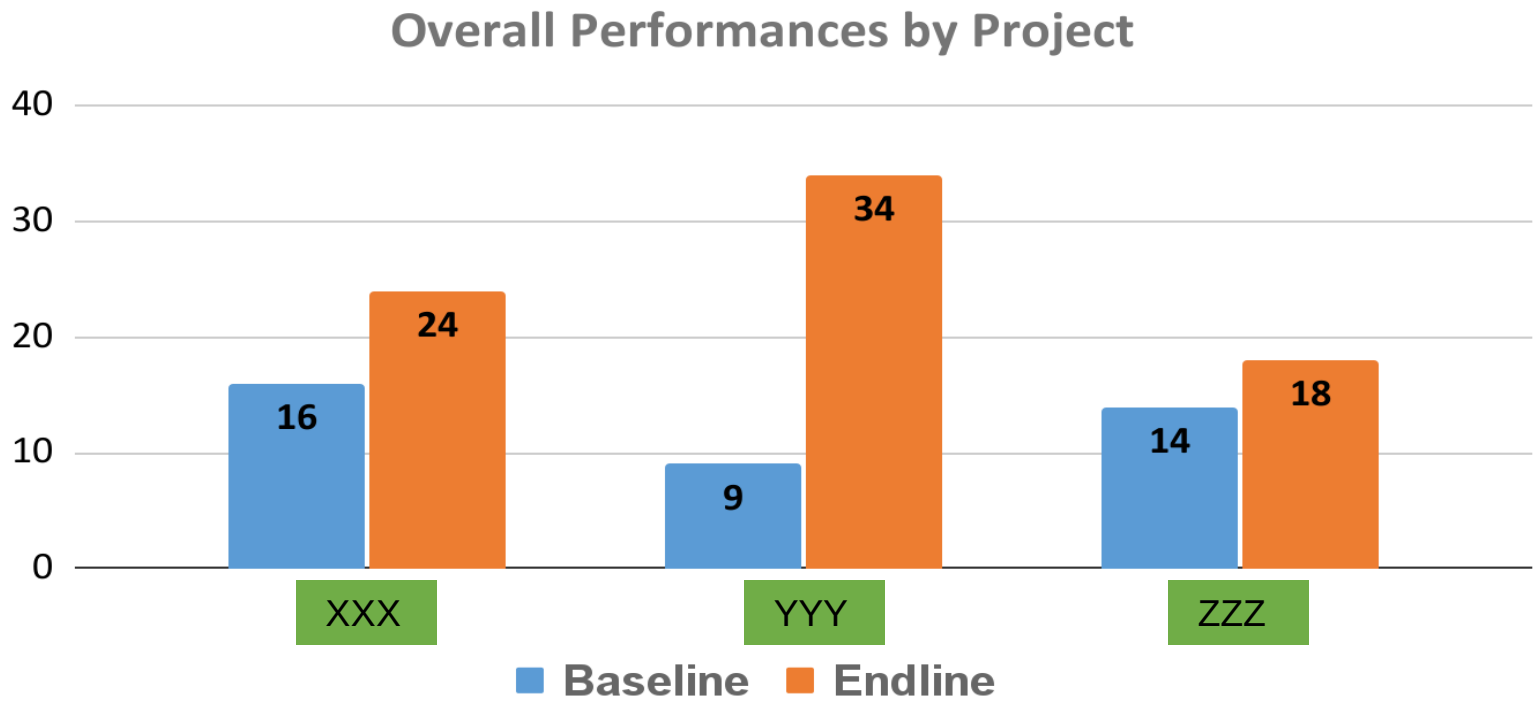
[Eduten Teacher Support Page]

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IMPACT OF THE PROGRAMME: LEARNER RESULTS

KNOWLEDGE TEST PERFORMANCE OF SCHOOLS IN THREE DISTRICTS

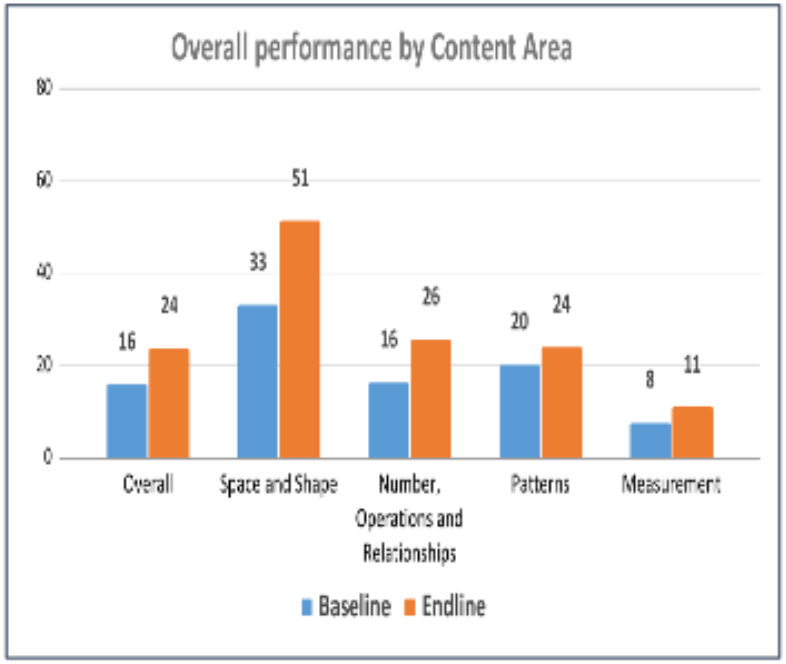


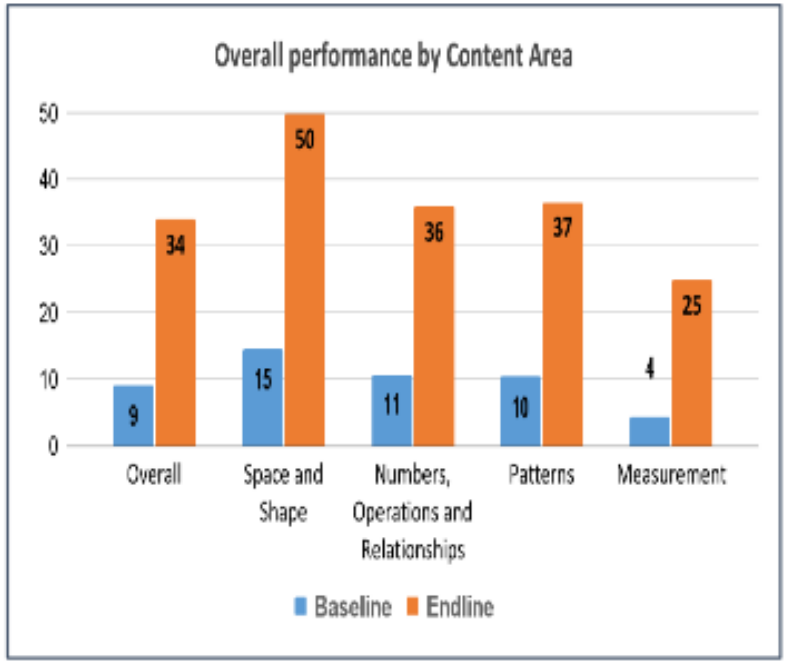
The Knowledge test performance is higher in the XXX Project, with an improvement of **+25%** (from 9% baseline to 34% endline). The improvement for YYY pilot is **+8%** and for the ZZZ project is **+4%.**

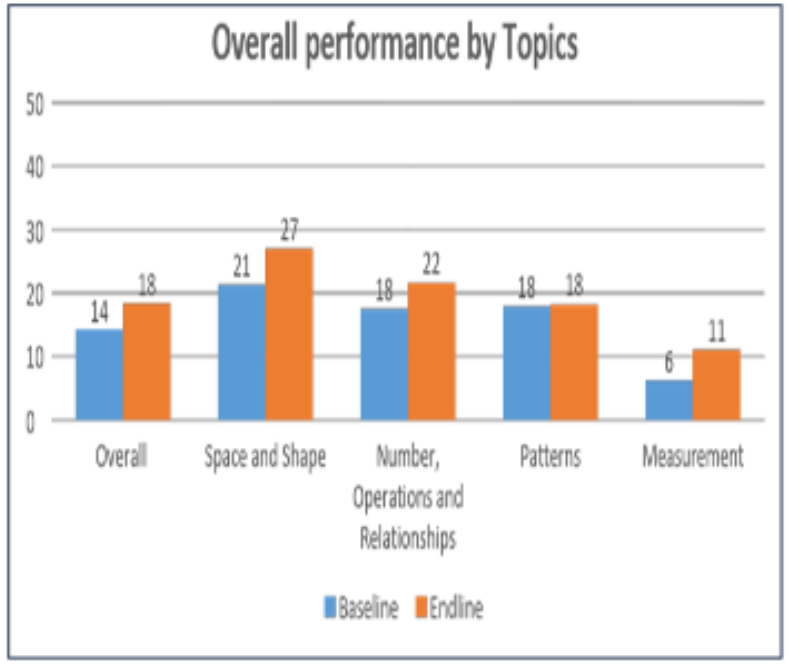
Overall, the Eduten Programme has contributed to shifts in learner knowledge across the three projects. In schools with access to a functional computer lab and stable internet connectivity, consistent lesson delivery and timely intervention were ensured, leading to improved learner performance

Case Study | Highlights

Performance of Grade 4 learners across 3 different Districts (Gauteng, Limpopo & N Cape)







XXX

YYY

ZZZ

GEN AI WG

