BINDING CONSTRAINTS LAB

Convening 4 June: Workshop report

Delivering **maths outcomes at scale** through digital learning

Summary

On 4 June 2024, the Binding Constraints Lab (BCL) convened a workshop on "Delivering Maths Outcomes at Scale through Digital Learning." The BCL's goal is to identify high-potential opportunities in education, and explore how they might be implemented at scale.

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Executive summary

Maths education in South Africa is in crisis: only 4 in 10 children are meeting low international benchmarks in Grades 5 and 9, and only 1% of children who start Grade 1 will matriculate with a Mathematics pass of 65% or higher.

Across South Africa, digital learning solutions aiming to improve children's maths skills are being tested and implemented. But achieving and measuring success remains challenging. To unlock and scale the potential of these innovations, collaboration is paramount.

This workshop, hosted by the Binding Constraints Lab and NASCEE, sought to identify and explore potential avenues for collaboration around using digital learning innovations to improve maths outcomes. Energy and discussion coalesced around five focus areas:

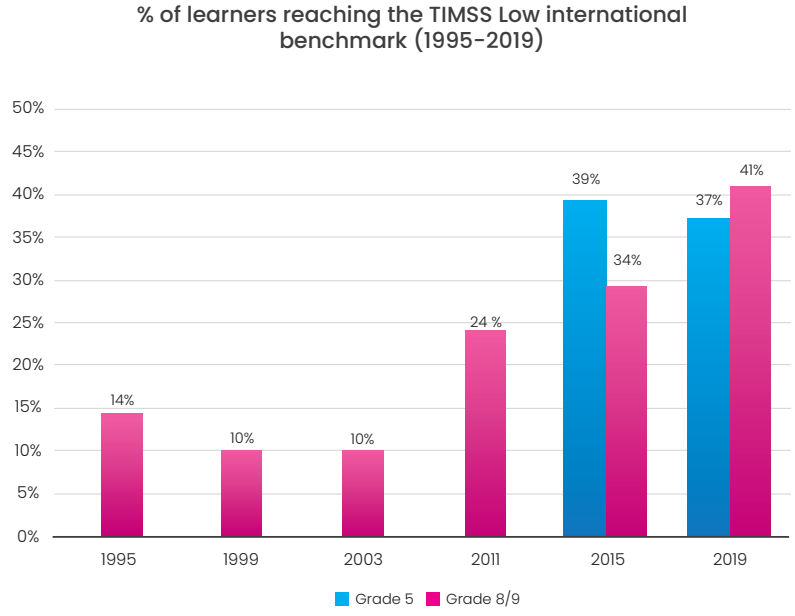
1. **Purpose:** What role should ed tech play to improve maths in South Africa?
2. **Measurement:** What common outcomes should maths ed tech organisations work towards? How should they measure success? And how can we align this with government priorities?
3. **Advocacy:** How do we "highlight the urgency and crisis" in maths education to drive more investment, research and focused collaboration?
4. **Government:** How might maths ed tech organisations work more effectively with government?
5. **People:** What are the key strategic issues to tackle to ensure effective adult mediation of content?

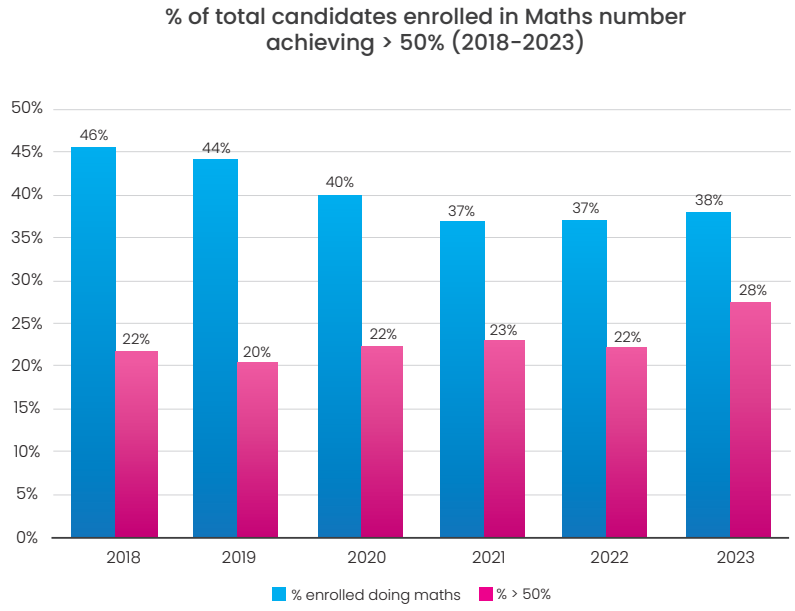
Participants were eager to reconvene to continue to learn and share and to explore collaboration around these opportunities.

Background

Maths education in South Africa is in crisis:

- While Grade 9 performance on the TIMSS[1] international assessments has improved since 1995, only about 4 in 10 children are meeting low international benchmarks in Grades 5 and 9[2].
- Fewer than 40% of matriculants are enrolled in Maths, and of those, only about a quarter pass with a mark of 50% or higher.[3]
- Of more than a million children who start Grade 1 each year, only 1% matriculate with a Mathematics pass of 65% or higher[4].





1 Trends in International Mathematics and Science Study

2 TIMMS longitudinal data

3 The percent of learners enrolled in Mathematics who passed with 50% or higher jumped from 20-23% from 2018 to 2022, to 28% in 2023. However, fewer candidates wrote matric and enrolled in Mathematics in 2023 and this likely drove the apparent increase. Source: Own calculations using Department of Basica Education . (2020 and 2023) National Senior Certificate Examination Report. https://www.education.gov.za/Portals/0/Documents/Reports/2021NSCReports/NSC23%20Technical%20Report.pdf?ver=2024-01-18-161615-123 and https://www.education.gov.za/Portals/0/Documents/Reports/2021%20NSC%20Reports/2020NSCREPORT.pdf?ver=2021-07-19-142304-897

4 Olivier, J. (2021). After School Programmes in South Africa: the investment case. The Learning Trust. https://www.thelearningtrust.org/the-after-school-investment-case-2021

Across South Africa, several **digital learning solutions aiming to improve children's maths skills are being tested and implemented**. Collectively, the 12 organisations represented at the workshop reported reaching 692 057 children in 2023. Some of this is with intensive direct programming, but most is through online offerings, which are often accessed at low frequency.

Achieving – and measuring – success remains challenging:

- Efforts are fragmented and often localised.
- Different models use different outcome measures and tools and rely largely on internal data, with little independent or comparative research.
- Maths is less easily understood by the public than reading.
- Bringing digital solutions to schools can be expensive and logistically complex, and can feel like a nice-to-have in under-resourced contexts.
- A legacy of failed digital learning interventions has made government wary of investing.
- Organisations' direction and focus can be heavily shaped by funder agendas.
- There is a disconnect between government and ed tech actors in terms of goals, policy and possibilities in a rapidly changing field, which stifles the potential for a coordinated strategic response.

To unlock the potential of existing digital learning innovations and achieve change at scale, **effective cross-sector collaboration is paramount**. The workshop sought to identify and explore potential avenues for collaboration among organisations using digital technology to improve maths outcomes in South Africa.

Workshop overview

Goals

When the Binding Constraints Lab team began exploring opportunities to improve maths outcomes in South Africa, digital learning tools (referred to in this report as "ed tech", short for educational technology) emerged as a prominent opportunity.

To further explore this potential, the workshop brought together 21 people from 12 organisations that are using digital technology in different ways to improve maths outcomes.
The high-level aims of the day were to:

- Build a spirit of collaboration through open and honest sharing
- Engage on key successes and pain points in achieving improvements in learning outcomes at scale
- Work towards defining a collective impact goal
- Select key levers for achieving this
- Emerge a collaboration model to take this work forward

The workshop was jointly hosted by the Binding Constraints Lab and the National Association of Social Change Entities in Education (NASCEE). Edulution served as a key thought and organising partner, greatly assisting with participant engagement and design of the day.

- **The Binding Constraints Lab (BCL)** identifies high-potential opportunities in education and explores how they might be implemented at scale.
- The National Association of Social Change Entities in Education **(NASCEE)** is an association of education non-profit organisations working towards maximising NPOs' contribution towards the national development goals related to education.
- **Edulution** is a digital learning platform designed for rural, developing-world contexts that is operating in Zambia and South Africa.

Emerging focus areas

Participants were excited to be in the room together. For many, it was the first time they had grappled collectively with questions of purpose, impact and scale. Enthusiasm to learn from each other and collaborate was high.

Through these discussions, participants clarified that to scale and work with government, their value proposition needs to focus on maths education and improved learning outcomes as the goal, and to position educational technology as a contribution to achieve that goal. Framing around "innovation for maths outcomes" may be more effective than "ed tech" to further adoption.
In the course of the day, energy and discussion coalesced around five focus areas:

1. **Purpose:** What role should ed tech play to improve maths in South Africa?
2. **Measurement:** What common outcomes should maths ed tech organisations work towards? How should they measure success? And how can we align this with government priorities?
3. **Advocacy:** How do we "highlight the urgency and crisis" in maths education to drive more investment, research and focused collaboration?
4. **Government:** How might maths ed tech organisations work more effectively with government?
5. **People:** What are the key strategic issues to tackle to ensure effective adult mediation of content?

Each of these is unpacked further in the workshop report. Opportunities for collaboration are summarised at the end.

Implementation-focused lessons about what is working well and what participants are still struggling with are also summarised in Appendix B.

1. Purpose: The role of maths digital learning solutions

Digital technology can enable maths learning in ways that are distinct from more traditional, paper-based approaches. Ed tech can individualise diagnosis of learning backlogs, tailor support to learners' learning levels, automate data collection, enable "anytime" learning, and scale cost-effectively.

But what role is it best poised to play? The workshop surfaced questions including:

- Should we focus on catch-up or curriculum coverage? Eliminating backlogs or deepening mastery?
- Does tech offer more potential when used "inside the system" (during the school day) or "outside the system" (independently, at home)?
- Which learners should we focus on?
    - Which grades are best served – or how might ed tech's goal differ depending on the target age group?
    - Which learners are the highest priority to help: those who are far behind, or those who are near grade level?
    - Do we want everyone to develop mastery of core concepts and skills, or to improve the results of the smaller pool of learners signed up for pure mathematics in high school?
- Should ed tech go where it can be more easily implemented, or should we focus on learners who are hardest to reach?

Ultimately, participants did not narrow in on a single answer, but agreed that the question of purpose should be explicitly engaged with when designing interventions, agreeing on sector-wide outcomes, building an advocacy story and engaging with government.

What matters most – platform or people?

Most participants agreed with the statement: "As a society, we should think about digital learning solutions like textbooks. Quality matters, but proper use with a supporting adult is the key."

While a small number of learners have the metacognitive skills required to learn independently, most need adult mediation – whether from a teacher, a tutor or a teacher assistant.
And while an effective digital solution needs to meet a minimum quality bar, increasing time on task, effective implementation and political acceptability are more important than finding one "best" platform or solution.

Ultimately, participants agreed that there is room in the maths digital learning arena for multiple, quality models to collectively increase reach and impact.

2. Measurement: towards common outcomes and tools

Unlike the reading sector, the maths education sector does not have common, well-defined and agreed-upon outcome indicators, measurement tools or benchmarks. While some organisations have conducted impact evaluations or compared learner results to a control group, most define their own measures of success and use their own internal data to evaluate impact. This makes it difficult for government to understand relative effectiveness and make decisions about which operators to work with and how to allocate budget.

Thinking about shared indicators emerged as a challenging but exciting opportunity for collaboration. Many people had not considered it before, but saw the benefit of clearly articulating what children should understand at key milestones, setting collective targets for improvement, and measuring progress in a consistent way across projects.

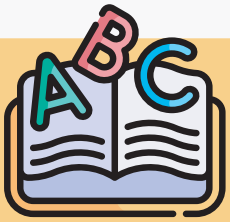
Potential common outcomes for the maths sector

While the workshop did not settle on outcomes, some of the ideas discussed are mapped below.

Foundation Phase

Establish benchmarks for key foundational skills per year

1



Grade 5

- % of learners meeting the low international benchmark on the TIMMS test (demystify this – clarify skills required)
- Mastery of foundational skills e.g. fluency in
  - Four operations (addition, subtraction, multiplication, division)
  - Percentages and fractions
  - Identifying basic shapes and their properties
  - Understanding measurement units and what they measure

2

Grade 9

% of learners meeting the low international benchmark on the TIMMS test (demystify this – clarify skills required)

3

Grade 10

% of learners enrolling in pure Mathematics

4

Grade 12

% of learners who:

- Pass Mathematics
- Achieve at least 50% in Mathematics
- Achieve at least 60% in Mathematics

5

Tertiary Education

TBD

6

Teacher development

Proficiency in required mathematics skills and knowledge

7

<< **Throughout the system** – Grades r to 12 • % of learners performing at grade level (75% mastery of x CAPS concepts for that grade) >>

Mastery vs. grade-level performance

Mastery is deep, long-term, secure and adaptable understanding of a mathematical concept, where students can solve unfamiliar problems and engage in complex reasoning.

Mastery-based learning means moving on when a concept has been mastered by the learner, not when it has been covered by the teacher. It is particularly effective in mathematics because it allows learners to grasp a concept fully before adding another layer of complexity.

Grade-level performance means meeting a certain standard on assessments when covering material at a prescribed pace. In the workshop, it was generally understood to mean **mastery of at least 75% of expected skills or topics for that grade.** (This is distinct from exam marks, where 30% can be defined as a pass, w viewed as a more meaningful measure of skills.)

When learners are not demonstrating mastery of grade-level concepts, it can be useful to assess which lower-grade concepts they have mastered, and focus on building mastery of those foundational skills. Outcomes and targets should take both mastery and grade-level performance into account.

In working towards common outcome measures, tools and targets, the maths ed tech community also needs to consider:

- **Balancing usability and insight:** While more complex tools can give granular information about mastery and backlogs, simple tools are more practical for widespread adoption.
- **Easily understandable benchmarks:** To take root across the sector, benchmarks need to be translated into easily understandable terms the public can grasp, like adding and subtracting single digit numbers.
- **Independence:** Internal data is not convincing to the Department of Basic Education (DBE) or the sector at large. Independent, comparative evaluation and research is needed to deepen understanding of what works and gain traction with government and funders.
- **Aligning with government:** Historically, DBE is concernded most about matric results; these need to remain prominent in collective goals, while engaging in advocacy to bring attention to foundational skills and lower grades. Independent research and evaluation should also align to DBE's own assessments and research agenda.
- **Global vs local frameworks:** Aligning outcomes, tools and targets to the South African CAPS curriculum is likely to be more politically attractive than using global frameworks.

Potential next steps could include:

- **Mapping what we know:** consolidating existing assessment tools, independent evaluations and organisational data to understand what we know and identify gaps.
- **Agreeing on goals:** Refining common outcome indicators, establishing the status quo for each, and setting targets for improvement.

Next steps should include maths education academics, who have sound pedagogical knowledge of what maths concepts children should understand at each age according to the CAPS curriculum and global frameworks. Some are already working on assessment tools for both children and teachers.

Measuring progress: highlighting different approaches

Siyavula uses internal data to measure users' mastery of curriculum-aligned topics and how it changes over time. It has found a high degree of correlation between students' results on its platform and their school marks.

Edulution Learning SA uses a 100-question assessment tool developed with Brombacher and Associates, which includes 25 questions at the child's grade level and 25 questions for each of the three prior grades, to pinpoint gaps in mastery and catch-up needed. (Grades 4-7)

Click Learning has developed a numeracy assessment based on the UNESCO Global Proficiency Framework for Mathematics, a document that defines key knowledge and skills learners should develop in primary and lower secondary school.

Jumpstart uses the Early Grade Maths Assessment (EGMA), an international standardised assessment tool that has been developed into a number of South African languages.

Axium Education uses a combination of a simple Teaching at the Right Level screening tool to place children into skills-based groups, and the Early Grade Maths Assessment (EGMA).

Numeric uses its own baseline, midline and endline assessment. All Grade 7 children in participating schools write these assessments, so Numeric can compare participating and non-participating learners.

3. Advocacy: how do we highlight the urgency of the crisis in maths education?

In recent years, South Africa's reading crisis has attracted attention and investment by coalescing around a compelling, simple story, shared benchmarks and consistent demands. (See box on Learning from the literacy sector below)

The crisis in maths education is no less dire – yet in comparison to reading, public and government awareness and investment in foundation phase maths lags behind. Participants were keen to explore how building a shared story about the maths crisis (and how to turn it around) could unlock more attention and support.

Learning from the literacy sector

In the reading and literacy sector, a more cohesive and sophisticated advocacy agenda has emerged that can offer lessons for the maths education community. What's worked?

- More evidence: There is more evidence, and better evidence, on how to shift early literacy outcomes at scale, both within South Africa and in other low-income countries. More independent research – and clear communication of lessons and findings – is needed to elevate the maths agenda.
- Achievement benchmarks: In recent years, the Department of Basic Education has worked with the research community to develop and adopt achievement benchmarks for the Foundation Phase in all South African languages. This enables common measurement across projects.
- A clear, compelling and urgent story: Translating standardised assessment scores into simple stats helps capture the public imagination. For example:
    - Fewer than 50% of children know the letters of the alphabet by the end of Grade 1.
    - Only 1 in 5 Grade 4 children can retrieve an explicitly stated fact from a simple text.
    - From 2016 to 2021, the number of Grade 4 learners who can't read a single word doubled.
- An annual event: Each February since 2022, the 2030 Reading Panel has convened sector players to share new research, learn from other countries and discuss priorities. The event garners media attention and promotes sector-wide dialogue. Should the maths sector consider a similar convening?
- Vocal and influential champions: A number of vocal actors have helped place reading high on government and funder agendas.

At the workshop, participants discussed what it would take to highlight the urgency in maths education: to build a compelling story that would attract attention and investment.

In addition to establishing collective outcomes and targets, as discussed above, key steps would include:

- **Clarifying the value proposition:** For example, improving maths knowledge has the potential to strengthen the economy and grow entrepreneurship. (Messaging may need to be differentiated, depending on the audience: government may be moe concerned with about catching up backlogs, while business may care more about hiring more highly skilled staff and reducing unemployment.)
- **Gathering research:** This should prioritise independent, publicly available, rigorous South African research, and performance on international assessments.
- **Using simple terms:** Phrases like "meet the low international benchmark" need to be translated into skills and concepts that the public can understand.
- **Understanding government priorities:** Advocacy requires understanding the DBE's current activities, struggles and constraints regarding maths education, assessment and technology. This includes engaging with the revision process underway for the White Paper on E-Learning (published in 2003) and revisions to the CAPS curriculum.

- **Demonstrating efficacy:** Pilots demonstrating impact at some minimum level of scale, such as a circuit or district, should be run and findings should be widely shared and well-communicated.
- **Clarifying the 'ask' and 'offer' to government**, based on the above.

4. Government: establishing policy, negotiating access

While organisations can attract money from philanthropy or business for design and piloting, most private funders expect government to come to the table for scale. Yet most participants find government challenging to access. There is no official policy for vetting and procuring digital learning products or integrating results into assessment frameworks. Government is sceptical and risk-averse due to past e-learning failures and the costs and challenges of continued ed tech provision. Integrating digital learning into the school day, for which there was more buy-in during the Covid-19 pandemic, has become more difficult. Subject advisor visits focus on curriculum coverage and compliance, not on supporting innovative learning initiatives.

Despite this, participants identified opportunities to align with government priorities and rhetoric, including:

- An increasing DBE focus on **catch-up and reducing learning backlogs**, including the introduction of **"teaching at the right level"** (TARL)
- "Innovation focused " topics including **"4IR"** (the Fourth Industrial Revolution), **"21st century skills"** like coding, and **entrepreneurship**
- Development and rollout of new **assessment tools**
- A narrative around **"maths for economic development"**

Navigating the DBE: who should maths ed tech engage with?

Discussion about where maths ed tech is "best located" within the DBE determined that:

- Advocacy and engagement should prioritise the **Curriculum Department**, which can influence how teachers spend their time, so teachers do not view digital learning solutions as "additional work" or a "nice to have."
- Close collaboration with **E-Learning, Teacher Development and Assessment** is also required. In particular, it is critical for any work on outcomes and tools to align with DBE's assessment tools and indicators.

More work is needed to identify and understand the key actors in digital learning and maths at a national and provincial level: What are they working on? What are they worried about? What constraints do they face? How can we ensure our offering and goals speak to their reality and help them achieve their goals?

5. People: mediation matters

Participants broadly agreed that adult mediation in some form is key to the success of maths ed tech programmes. While 80% of attendees use adults to mediate maths content, 20% do not.

Models vary. The mediator could be a teacher, a teacher assistant (TA) or a tutor. Training ranges from two hours online to a two-week bootcamp; the cost of training varies from paying for 2MB of data to R45,000 per person. Programmes that rely on teachers faced different issues than those working with TAs or tutors (often unemployed young people from the community).

A few strategic areas emerged that could benefit from further collective work, including:

- **Funding for scale:** For programmes using tutors or TAs, securing funding for stipends or salaries is a major constraint to scale. Some programmes have tapped into large-scale government employment programmes, including YES and the Social Employment Fund, to secure stipends (see box on securing stipends for scale below).
- **Attraction and retention strategies:** There was general agreement that to develop proficiency, deliver outcomes and benefit personally, facilitators should work for at least six months, and ideally for a year or more. Yet churn is often high, particularly in programmes with low pay, and exit pathways for facilitators are not clear. Are there opportunities to create a pipeline of talent, where maths facilitators move on to teaching internships or to roles in other organisations?
- **Articulation with teacher training:** Could maths ed tech programmes offer in-service learning for teachers-in-training, where B.Ed candidates get credits by facilitating digital learning in schools?
- **Ed tech solutions as an opportunity to support and enhance teacher maths delivery:** How to work with and support teachers effectively was a question common to many in the room.

Securing stipends for scale

Large-scale employment programmes that can be used to secure stipends include:

Social Employment Fund (SEF): The SEF is part of the Presidential Employment Stimulus (PES) announced in October 2020. It funds civil society organisations to create part-time jobs doing "work for the common good." Participants are paid for two days of work per week at minimum wage. Both the Learning Trust (TLT) and Lefa/Velle have used SEF to significantly scale up their work.

Youth Employment Service (YES): YES provides 12-month work experiences at businesses and nonprofits. Businesses can host YES interns, or pay to create posts elsewhere. Click Learning uses YES to fund one-year facilitator posts, and partners with Harambee to recruit and screen unemployed young people.

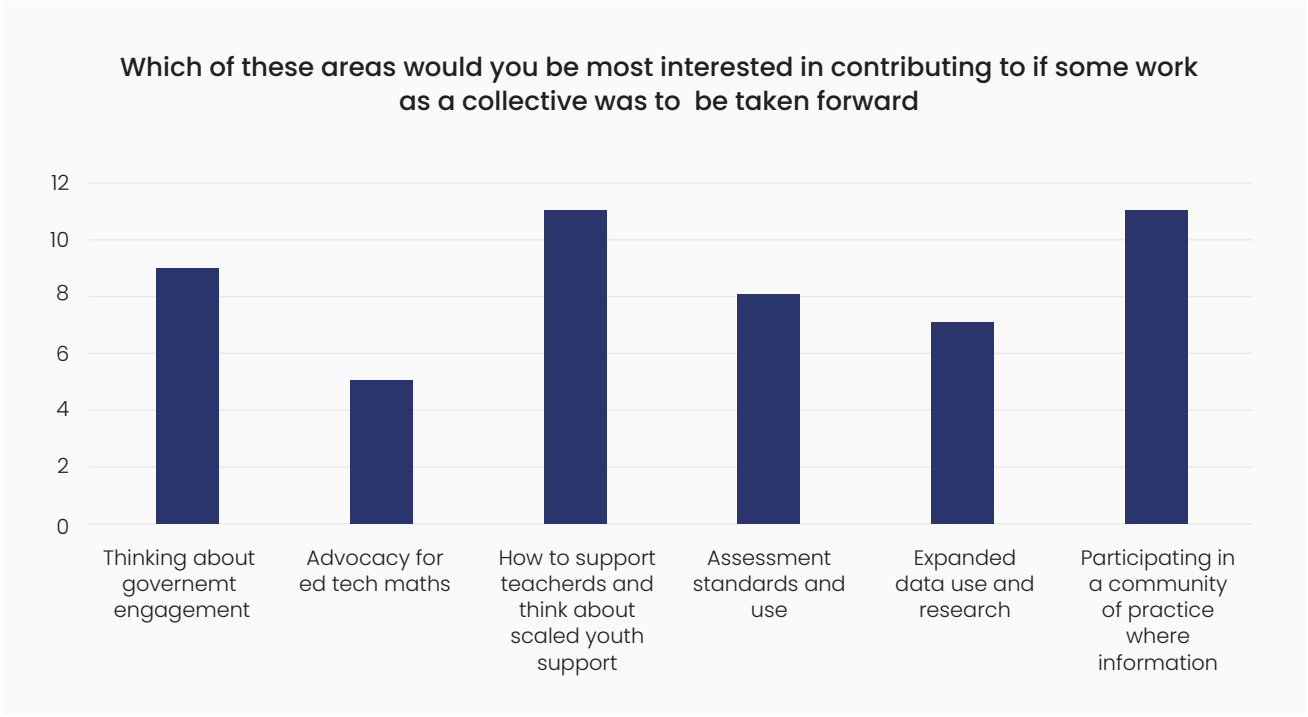
Basic Education Employment Initiative (BEEI): Like SEF, the BEEI is part of the Presidential Employment Stimulus (PES). It has placed more than a million young people in every public school in the country to provide support with tasks including curriculum delivery, ICT, reading, maintenance and admin.

Initially, it focused on reducing unemployment. Unlike the SEF or YES, BEEI youth are employed by the Department of Basic Education. Since the BEEI's recent renewal, there is a greater push to improve learning outcomes, and going forward there may be an opportunity to involve some BEEI youth in delivering learning programmes.

Opportunities for collaboration

100% of people who completed the post-workshop survey (n=18 of 20 ed-tech organsation participants) agree that there is value in approaching educational technology for mathematics as a collective effort.

Specific interest areas for participation are indicated in the figure below. Interest in themes could be bucketed into "government and advocacy", "the supporting adults", and "measurement and research".



Topics and questions to explore further include:

Measurement

- What do we know about the current situation, based on existing data and research?
- What common outcomes might we work towards as a sector?
- What kinds of tools and data should we use to measure these outcomes?
- What collective targets might we set for improvement?
- What kinds of independent, external research are needed?
- Would there be interest across multiple organisations to collaborate on promoting and measuring a key skill, such as proficiency in times-tables or fluency in the 4 operations?

Advocacy

- How can we frame the importance of maths education, and the role educational technology can play, for different key audiences (including government)?
- What research and data can we use to tell the story of the maths crisis in South Africa?
- How can we translate learning goals into simple, easy-to-understand language that can galvanise the public?
- What are government's priorities for maths education and e-learning, and how can we best align to these?

Government

- How can the maths ed tech community best align with government priorities?
- Who are the key players in national and provincial government that we should be engaging with?
- Are there opportunities for coherence of ed tech solutions in line with the recurriculation process in maths if it moves ahead?

Human resourcing

- How can maths ed tech solutions leverage youth and public employment programmes to increase scale?
- How might we build pathways that retain maths tutors and coaches within the education sector?
- How could we better collaborate with, train and support teachers to adopt digital learning platforms?

Appendix A: workshop participants

The following people attended the workshop:

Name	Organisation
Mashiya Pithi	Axium Education
Joy Olivier	Binding Constraints Lab
Laura Poswell	Binding Contraints Lab
Sipumelele Lucwaba	Binding Contraints Lab
Ayanda Mtsatse	Click Learning
Rob Urquhart	Click Learning
Dave Fair	Edulution
Mike Clarke	Edulution
Richard Akwei	Edulution
Dietrich Baron	Edunova
Colin Vincent	Edunova / XL Foundation
Dolan Govender	Edutech Institute
Katie Huston	Independent
Tsepo Ngwenyama	Injini EdTech Accelerator
Callen Hodgskiss	Jumpstart
Jeanette van der Breggen	Mathsbuddy
Giles Gillett	NASCEE
Sibonelo Nongcula	Numeric
Andrew Barrett	OLICO Maths Education
Patrick Iroanya	OLICO Maths Education
Tracey Butchart	Reflective Learning
Eugene Pelteret	Reflectove Learning
Mark Horner	Siyavula Foundation
Charlene Petersen Voss	The Learning Trust
Devarshinee Chetty	Velle Afterschool Program
Tebogo Loate	Velle Afterschool Program

Appendix B: Lessons from implementation

At an implementation level, participants enjoyed the opportunity to share and discuss lessons and pain points: what has worked well for them, and what they still need to figure out. Highlights of this conversation are documented below.

What has worked well?

Participants shared strategies that they believe have contributed to their success, including:

- **Recruiting the right people:** Unemployed young people are capable of working with lower grades, while university students are better-placed to help with high school maths. In addition to maths knowledge, organisations recruit for passion, inter-personal skills and a positive attitude.
- **Platform choice:** Using existing platforms with enabling functionality can support learning. For example, Telegram does not require a password or login, and features like persistent history (where group history is retained from inception so new members can search past topics) and live revision sessions (which can be compressed into low-data recordings) enable effective virtual tutor support.
- **Many-to-many ratios:** Placing learners in groups with multiple tutors ensures that learners don't rely on one tutor to know everything or be available at all hours.
- **Using in-depth data to personalise instruction:** Detailed data on backlogs and which skills children are struggling with enables more effective catch-up strategies.
- **Using the after-school space to focus on catch-up:** Working outside of the school day enables programmes to target and reduce backlogs, rather than focusing on grade-level content.
- **Incentives, rewards and recognition:** Multiple organisations use incentives including certificates, wrist bands, awards ceremonies, leaderboards, revision challenges and prizes to motivate engagement.
- **Outcomes-based funding:** Linking tutor pay to time on task and learner outcomes can improve the quality of implementation.
- **Explicit strategies for government collaboration:** Including government engagement as part of the programme model (and explicitly resourcing it) enables successful buy-in and collaboration.

What are we struggling with?

Many of the pain points have been mentioned in the main report, including:

- How to position maths education as urgent, and digital solutions as a relevant response
- How to navigate competing priorities: quality vs. reach
- How to secure resources for scale without ring-fenced government funding
- How to develop employment pathways for youth facilitators
- Fragmentation: a lack of shared language, data and understanding between programmes makes it difficult to engage with government
- How to engage with government in the absence of policies to vet, assess and procure digital learning solutions
- How to reconcile the divergence between funder agendas and innovation

Others include:

- **Hardware and infrastructure:** For organisations that rely on school- or centre-based technology, security and theft, connectivity, maintenance and insurance are common challenges. In programmes that rely on personal devices, facilitators often have slow, cracked entry-level phones, which holds back delivery.
- **Integrating programmes into timetables and teacher workflows:** Securing dedicated time in school timetables is challenging. Integrating systems into teacher workflows requires removing an existing responsibility and aligning with what subject advisors assess at compliance visits.
- **Determining dosage:** More contact time is better, but it can be challenging to determine what is enough, and to secure that time with learners.
- **Teacher training:** Many teachers have poor digital literacy, and train-the-trainer models do not always trickle down as intended.
- **Platform adoption:** While platforms like Telegram have useful features, getting people to use a platform they are not already on can be challenging.
- **Parent engagement:** Out-of-school solutions require parental buy-in and support.

With limited time, sharing successes and pain points focused largely on sharing each organisation's experiences. Future engagements could explore how to translate lessons from specific provinces or other African countries into wider application, or how to collectively problem-solve around shared challenges.

BINDING
CONSTRAINTS
LAB

46 Hof St
Oranjezicht
Cape Town
8001