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Acknowledgements

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We would also like to thank all of the participants in the Challenge Scoping Lab—from government, unions, private sector, and academia—who gave of their precious time to clarify the challenges facing the education sector in South Africa, for which information and communication technologies may prove a solution.
Challenge Scoping Lab participants interview a principal at a rural secondary school on challenges facing the school system.

Section I: Executive Summary and Background
Executive Summary

Improving the quality and efficiency of teaching and learning remain persistent challenges in basic education in South Africa. Despite numerous interventions to strengthen learner achievement and teachers’ pedagogical content knowledge, limited progress has been made, particularly in essential subjects, such as literacy, numeracy, science, and mathematics. For example, in 2011 South African students’ average Trends in International Mathematics and Science Study (TIMSS) scores in mathematics and science were the 3rd lowest scores of 45 countries, ahead of only Botswana and Honduras (TIMSS 2011). Guiding these educational interventions, the basic education sector is aligned toward attaining those goals outlined in the National Development Plan and Schooling 2030, such as increasing learner competencies and performance in language and numeracy or mathematics, increasing the number of Grade 12 learners that pass physical science and mathematics, and improving the professionalism, teaching skills, subject knowledge, and computer literacy of teachers. Enabling achievement of these goals, Information and Communication Technologies (ICT) are tools that can be leveraged to tackle myriad challenges in an effective, efficient manner. Innovative and effective use of ICTs holds the possibility to enhance the quality of teaching and learning, while improving the efficiency of administration. The question is how to best seize the potential of ICTs to fuel South Africa’s education system reforms.

Answering the question of how to guide future planning and implementation around ICTs in education, the government of South Africa adopted a problem-solving lab methodology initially developed by the governments of the United Kingdom and Malaysia, and more recently implemented in countries as diverse as Tanzania and the United States. Known as Operation Phakisa in South Africa (“phakisa” means “hurry up” in the Sesotho language), this “Big Fast Results” (BFR) methodology has been adapted and used by two other government departments to date: the Department of Environmental Affairs and Department of Health. In true spirit of a lab approach, the Department of Basic Education (DBE) worked with World Bank Innovation Lab experts to improve and customise the methodology specific to the education sector’s challenges. To start this process, DBE and Operation Phakisa worked with the World Bank to identify key challenges in the education sector for which ICT interventions might prove transformative, using a unique Challenge Scoping Lab process. Following from the Challenge Scoping Lab, the forthcoming follow-on BFR Lab will be innovative, adaptive, and efficient. In mid-2015, the Government of South Africa will implement this planned four-week Lab aimed at delivering a detailed “3-foot” implementation plan for using ICTs to effectively take on critical challenges within the education section.

How the Challenge Scoping Lab prepares for the BFR Lab

Understanding the challenges most critical to education requires clarifying opportunities and constraints confronting those individuals who use the education system (e.g., learners, parents, etc.), those responsible for implementing education programs (e.g., teachers, provincial administrators, teachers’ trainers), and other stakeholders (e.g. technology firms, teachers’ unions, etc.). From 22 through 26 June 2015, a cohort of ten education professionals worked to understand the needs of these stakeholders and—by comparing these insights to systematic challenges identified by education experts—identify the most important problems facing the sector. This core group of ten (the “core 10”) then worked with 30 additional stakeholders (for a total of 40 people), including private sector, unions, and additional individuals from across South Africa’s provinces from 29 June through 1 July to shape these insights into key “starting challenges” that the forthcoming BFR Lab on ICT and education can take on.

The goals of this Challenge Scoping Lab were to clarify the thematic scope of the BFR Lab—what problems should be prioritized—and identify key challenges to spur solution generation. These challenges would then inform finalisation of the “work streams” to be used to develop and hone solutions during the BFR Lab. Beyond identifying challenges to be taken on in the BFR Lab, this Challenge Scoping Lab sought to
continuously engage groups of participants who will serve as focal actors in the BFR Lab (in which a total of roughly 120 people will be invited to develop priorities and craft detailed implementation plans). To this end, the “core 10” saturated themselves in information on the challenges facing education and shared their insights with the broader group of 40. Together, these groups will serve as a “golden thread” that weaves the findings and essential information into the BFR Lab.

Challenge Scoping Lab Approach and Methodology
The Challenge Scoping Lab laid the groundwork for the BFR Lab by first exploring problems within the education sector and then identifying those key challenges that establish the strongest focal points for action by the BFR Lab. Specifically, though the Scoping Lab did not directly focus on ICTs in education, it worked to identify challenges in education for which ICTs might provide a solution (including larger-scale problems that have taken place in ICT implementation). Figure 1 portrays the participants’ journey within the Scoping Lab. To begin, participants diverged (“Explore the problem”) and came up with numerous problems facing education. They then converged (“Identify key challenges”) on problems that DBE should consider taking on in the BFR Lab. In the BFR Lab, the larger group will again diverge while developing numerous possible solutions (“Develop solutions”) and then converge on those solutions to be implemented (“Implement solutions”).

In diverging and then converging on key challenges, participants embraced a “human centered design” approach, which focuses on learning about the needs, fears, hopes, and desires of users (in this case, students and teachers) and stakeholders (e.g., provinces, unions, and private sector) relevant to potential solutions. To effectively understand user and stakeholder perspectives, it is essential to speak to, and empathize with, these individuals. Over the eight days of the Scoping Lab, participants heard perspectives from over 40 users and stakeholders through the process described below.
Week 1 Overview
During the Scoping Lab’s first week (22-26 June), a core group of ten individuals from DBE, Department of Science and Technology (DST), Department of Telecommunications and the Postal Services (DTPS), and a number of provinces sought to understand user and stakeholder needs and perspectives in basic education. They did this by interviewing students, teachers, and administrators and holding presentations and panel discussions with representatives from provinces, the private sector, unions, as well as subject matter experts. Through these interactions, they explored systemic challenges both in the education sector broadly and in ICT implementation. At the end of the week, the core 10 synthesized observations gathered from the over 30 individuals they spoke with. They developed insights by analyzing their findings and used these as a basis to develop presentations that they would use the following week to share findings with the larger group of 40 Challenge Scoping Lab participants.

Week 2 Overview
The second week of the Scoping Lab (29 June-1 July) began with the core 10 sharing insights with the larger group of 40 (the core 10 plus 30 new stakeholders), who noted those points they found especially important, discussed key issues, and synthesized these observations into draft starting challenges for the BFR Lab. 29 July focused on presentations by core 10 members, while the 30th and 1st involved vigorous discussion, honing of thematic areas that had come to the fore throughout the process, and development of challenges. Upon developing starting challenges, participants tested challenges by ideating potential solutions, using the challenges as starting points. Following the Scoping Lab’s close, the World Bank team synthesized outputs from both weeks of the Lab and—building off of challenges developed by the group of 40—honied 46 potential starting challenges for the BFR Lab.

Starting Challenges and Work Streams
Starting Challenges from the Challenge Scoping Lab
The Scoping Lab produced a number of outputs, however, most important to the BFR Lab are the starting challenges conceptualized in rough form by the group of 40 and then honed by World Bank facilitators. These honed challenges were compared to challenges that workshop participants prioritized, and four top challenges were identified for each stakeholder group based on participant emphasis/votes. The DBE and Operation Phakisa may use these challenges as starting points for idea generation in the BFR Lab. These starting challenges may also influence the DBE’s choice of Work Streams for the BFR Lab.

While these challenges come from the perspectives of all stakeholders interviewed (e.g., learners, unions, etc.), many challenges focus specifically on the experiences and needs of learners and teachers, the most critical actors in educational development. Learners and teachers face a myriad of needs: access to the
internet for students, ability to get work done within the allotted time for teachers, and similar daily, continuous challenges. Many of these challenges focus on making learning more effective and improving the lives and working conditions of teachers. These challenges do not necessarily map to specific ICT interventions, but many of them could be taken on through smart use of ICTs.

Beyond learners and teachers, many challenges speak to the need for better coordination between key actors (e.g., government, provinces, unions, etc.) and for stronger policy implementation. Because many proposed challenges focus on issues that are elemental (e.g. the need for textbooks) or at a high level (e.g. policies based on research), this suggests potential modifications to the Work Streams planned for the BFR Lab. See below for a full list of potential starting challenges, organized by user/stakeholder.

**Learner Challenges**

<table>
<thead>
<tr>
<th>Top Challenges: How might we design a solution that...</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Allows learners to have teachers that are prepared and committed to quality teaching?</td>
</tr>
<tr>
<td>• Allows learners to have a safe environment that keeps them engaged and protects them from the ills of society?</td>
</tr>
<tr>
<td>• Allows learners to access a range of subjects that cater to their future career choices?</td>
</tr>
<tr>
<td>• Allows learners to develop holistic skills that prepare them to be successful in the future?</td>
</tr>
</tbody>
</table>

**Additional challenges: How might we design a solution that...**

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<table>
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<tbody>
<tr>
<td>• Allows learners to feel like teachers care for their well-being?</td>
</tr>
<tr>
<td>• Allows learners to be inspired by real, tangible examples of people who found success through schooling?</td>
</tr>
<tr>
<td>• Allows each individual learner enough time with learning resources (e.g. textbooks) to complete their daily after school studies?</td>
</tr>
<tr>
<td>• Allows learners to find quality information to make informed decisions about their careers?</td>
</tr>
<tr>
<td>• Allows learners to have regular, predictable access to the internet (to enable research and learning)?</td>
</tr>
</tbody>
</table>

**Teacher Challenges**

<table>
<thead>
<tr>
<th>Top Challenges: How might we design a solution that...</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Allows teachers to have regular, sustained support to use ICT for teaching?</td>
</tr>
<tr>
<td>• Allows teachers to access tools and technologies to enhance learning by learners?</td>
</tr>
<tr>
<td>• Allows teachers to feel valued in their profession? <em>(Shared Challenge: Also a Challenge for Unions)</em></td>
</tr>
<tr>
<td>• Allows teachers to efficiently and effectively deal with their workload?</td>
</tr>
</tbody>
</table>

**Additional challenges: How might we design a solution that...**

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<table>
<thead>
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<tbody>
<tr>
<td>• Allows teachers to be supported by a community of peers for learning and sharing?</td>
</tr>
<tr>
<td>• Allows teachers to be supported in the multiple roles they must play?</td>
</tr>
<tr>
<td>• Allows teachers to access tools and technologies to make teaching easier?</td>
</tr>
<tr>
<td>• Allows teachers access to adequate textbooks and other teaching resources?</td>
</tr>
<tr>
<td>• Allows teachers to feel confident in using ICTs?</td>
</tr>
<tr>
<td>• Allows teachers to have regular, sustained training and support to provide holistic education?</td>
</tr>
<tr>
<td>• Gives teachers clarity on which methods to use and how to use them to teach 21st century skills?</td>
</tr>
</tbody>
</table>
Province Challenges

Top Challenges: How might we design a solution that...
- Allows provinces to have additional, adequate, ring-fenced funding for ICT initiatives?
- Allows for ongoing coordination between all relevant implementers (e.g., government, service providers, NGOs, etc.) at provincial and national levels?
- Allows provinces to ensure that accredited training is delivered to teachers?
- Allows for dedicated national senior leadership to champion the vision for ICT in education?

Additional challenges: How might we design a solution that...
- Allows schools to ensure enough of the right teachers to fill subject area needs?
- Allows for stable and ongoing senior provincial leadership dedicated to ICT in education?
- Allows provinces to buy into have a clear national vision for ICT in education, and specific roll-out plans that relate to individual provinces?
- Allows for un-fragmented implementation of long-term, sustainable ICT solutions at school level?
- Allows provinces to have clear norms and standards on how to engage with service providers in implementing national plans?
- Allows each school sustained access to the resources necessary for ICT support and maintenance?
- Allows all schools in every province connectivity to the internet for teaching, learning, and administration?
- Allows provinces to be fully aware of clear norms and standards on teacher training in ICTs?
- Allows provinces to incentivize teachers to undergo ICT training?

Union Challenges

Top Challenges: How might we design a solution that...
- Allows unions to see evidence of realistic policy making through researched, evidence-based design?
- Allows unions to be consulted regularly by the government on policies that impact teachers?
- Allows teachers to access regular, accredited professional development that is customized to individual teacher needs?
- Allows teachers to gain confidence in relevant ICT skills through professional training?

Additional challenges: How might we design a solution that...
- Allows both urban and rural schools to access the unique teaching and learning resources they need?
- Allows unions to trust that public education will remain free, of high quality, and without commodification?
- Allows unions to have trust that government procurement systems and processes are corruption-free and accountable?

Private Sector Challenges

Top Challenges: How might we design a solution that...
- Allows the private sector to develop ICT solutions based on clearly defined education goals and needs?
- Allows the private system to engage in a transparent and corruption free tender system with clear specifications?
- Allows the private sector to focus on delivering solutions to learner needs first rather than ICT needs?
- Allows the private sector to engage with the government on long-term, profitable/sustainable ICT initiatives?

Additional challenges: How might we design a solution that...
- Allows the private sector to make a sustainable profit?
- Allows the private sector to avoid one off involvement in ICT projects?
Proposed Work Streams for BFR Lab

Work Streams are thematic areas within the BFR Lab in which working groups will develop solutions and then plan for implementation (Work Streams were used for this purpose in both previous South African BFR Labs). Currently planned Work Streams represent priorities for ICTs in Education identified by the Government of South Africa. Currently planned Work Streams include: Digital Content, Infrastructure, Connectivity, Teacher Professional Development, and E-administration.

In analyzing the multitude of challenges and insights that emerged through the Challenge Scoping Lab, and specifically due to the systemic issues raised, we suggest modifications to Work Streams. From participant feedback it appears that there are high-level challenges that inform decision-making broadly and, indeed, on the existing Work Streams. Rather than falling within the initially designed Work Streams, some challenges and insights gathered from participants suggest the need for the following higher level themes: Leadership in Education (includes policymaking and management of education), Support for Learners (includes curriculum and learning environment), Resource Procurement, and Collaboration on Education. These proposed Work Streams have been developed by World Bank facilitators based on participant outputs.

Beyond these additional Work Streams, Teacher Professional Development may be a limiting category, because of the varied human resource needs in education. Rather, a more ample category on Human Resources can cover needs for teachers as well as administrators, ICT technicians, and related needs.

Conclusion

As noted, the Challenge Scoping Lab’s outputs will provide a starting point for the BFR Lab, which will take place later in 2015. The Challenges developed through this process provide a strong starting point for idea generation and the development of solutions that can be implemented through a set of “3-foot plans”.

More detail on this process is available in the following sections. In Section II, find the Challenge Scoping Lab methodology. Section III provides information on starting challenges and existing and proposed Work Streams. Section IV features a discussion of lessons learned both on the methodology and in terms of content for the BFR Lab as well as proposed next steps. Following that section, find annexes featuring a number of outputs from the Scoping Lab process.
Background on Policies and Interventions on ICT in Education

Challenges in Education and the Potential of ICTs
Improving the quality and efficiency of teaching and learning remain persistent challenges in basic education in South Africa. Despite numerous interventions to strengthen learner achievement and teachers’ pedagogical content knowledge, limited progress has been made, particularly in essential subjects such as literacy, numeracy, science, and mathematics. For example, in 2011, South African students’ average Trends in International Mathematics and Science Study (TIMSS) scores in mathematics and science were the 3rd lowest scores of 45 countries, ahead of only Botswana and Honduras (TIMSS 2011). Guiding these education interventions, the basic education sector is aligned toward attaining goals outlined in the National Development Plan and Schooling 2030, such as increasing learner competencies and performance in language and numeracy or mathematics, increasing the number of Grade 12 learners that pass physical science and mathematics, and improving the professionalism, teaching skills, subject knowledge, and computer literacy of teachers (Government of South Africa 2012).

Enabling achievement of these goals, ICTs are tools that can be leveraged to tackle myriad challenges in an effective, efficient manner. Effective use of ICTs can enhance the quality of teaching and learning, while improving the efficiency of administration. The question is how to best seize ICTs’ potential to fuel South Africa’s education system reforms. The following section provides a brief background on some of the ICT policies and initiatives that have taken place effect in South Africa over the past two decades.

African ICT and Education Policy Trends
While policymakers and thought leaders around the world highlight the potential of ICTs to transform the nature of learning, the high cost of ICT equipment, infrastructure, training, and the myriad of systemic challenges to implementation have been particularly prohibitive in developing and emerging-market countries, leading to a gap in access, infrastructure, and training for ICT. The gap in access is known as the “digital divide,” separating populations with the ability to benefit from ICTs from those that do not (UN News Centre 2012). Many of the policy efforts on ICTs across Sub-Saharan Africa have focused on reducing this digital divide and, specifically, on using ICTs to enhance learning in schools.

To broadly address inequities in access to ICTs, the New Partnership for Africa’s Development (NEPAD) has instituted policies and initiatives across Africa (NEPAD 2012). NEPAD established a framework for an ICT infrastructure in the continent through their e-Africa programme, contributing to a 20% increase in the usage of ICTs in Africa (DBE 2004). NEPAD’s ICT Broadband Infrastructure Network for Africa, seeks to connect all African countries and the rest of the world though a submarine cable extending from Europe to South Africa, which was laid prior to the 2010 World Cup (NEPAD 2012).

On ICT for education specifically, NEPAD’s e-Schools Initiative operates in 16 countries, including South Africa, to provide schools with ICT equipment and training to enhance learning (NEPAD 2012). By 2007, the e-School Initiative had launched demonstrations in 80 schools and begun shaping ICT policy; however, insufficient human and fiscal resources, variance in country preparedness, and different views of best practices have slowed the uptake of e-School demonstrations (Farrell et al 2007). Taking inspiration from continental interventions, but also striving to learn from the mistakes of other nations, South Africa has for the past nearly two decades developed and implemented policies and strategies on ICT for education.
ICT for Education in South Africa

While South Africa has adopted ICTs more quickly than many Sub-Saharan countries, it continues to lag behind some economic peers in ICT penetration and internet use. For example, while 72% of Chile’s population uses the internet, as do 65% of people in Argentina, and 68% in Malaysia, only 49% of South Africans access the internet (World Bank 2015). This same gap applies to schools; while South Africa is ahead of most African countries in ICT investments, business leaders interviewed by WEF perceive that South Africa is behind some Southern African countries, and barely above others, in the prevalence of internet in schools, despite (with the exception of Botswana) being ahead in GDP per capita (see fig. 3). South Africa’s government recognizes these challenges, and has taken steps to leverage ICTs for education. The following section provides background on South Africa’s e-Education policy, outlining developments over the past two decades.

Past ICT policies and interventions

In response to challenges facing the education sector, and its bold national goals, South Africa has energetically promoted integration of ICT in education. In 2001, the government established both the Presidential National Commission on Information Society and Development and the Presidential International Advisory Council on Information Society and Development to advise on developing the national strategy for integrating ICT into South Africa’s education system. The process resulted in the government highlighting three areas for improvement: (1) ICT professional development; (2) quality of, and access to, electronic content resources; and (3) ICT infrastructure and connectivity.

In 2004, the DBE continued the evolution of ICT policy through the introduction of the White Paper on e-Education, with a policy goal of becoming “ICT capable,” meaning that students and education professionals would “use ICTs confidently and creatively to help develop the skills and knowledge they need to achieve personal goals and to be full participants in the global community” by 2013. Specifically, the White Paper included six strategic objectives: (1) ICT professional development; (2) electronic content resources; (3) infrastructure for e-Education; (4) connectivity; (5) community engagement; and (6) research and development. To analyze the White Paper’s impact, the DBE conducted audits and analyzed province-level data. Evaluation unearthed a consistent focus on inputs, such as curriculum, infrastructure, and materials; but found that the activities that demonstrate impact (e.g., delivery, monitoring, and evaluation) and training remain challenges. For instance, on a national level, the goal of establishing “access to ICT infrastructure” was successfully met through the provision of school laboratories, but metrics failed to capture if ICT infrastructure was used effectively.

Since the White Paper’s implementation, the government has developed several additional policies to promote ICTs in education. The Cabinet adopted a National Information Society and Development (ISAD) plan in 2007, to build South Africa’s information society, which would be carried out by two new governing bodies: a Ministerial ISAD Committee and a Forum of Directors-General ISAD Cluster (Isaacs 2007). Additionally, the government has supported provincial and local ICT development efforts.
South Africa faces numerous opportunities in ICT for education as well as challenges. Workshops held by DBE and the World Bank in 2014 determined that the White Paper’s goal of South African learners and educators becoming ICT capable has not been met (DBE 2014; HRSC 2014). However, while the national government has faced difficulties in implementing ICT for education programs, provincial governments have pursued their own initiatives. For example, Gauteng’s Department of Education has taken steps toward developing paperless classrooms, including providing classrooms with over 17,000 laptops/tablets and expanding internet access (Gauteng Department of Education 2015). Likewise, Western Cape has provided schools with new and updated technology, ICT trainings for educators, and modified e-Education methodologies as part of their vision for ICT in education (Grant 2012). These represent promising initiatives, however, without a clear national implementation strategy for ICT in Education, inequity will likely remain pervasive in the education system. The challenges of implementing ICT solutions across South Africa, the opportunities afforded by ICTs, and a recognition of young people’s need for 21st Century skills prompted the DBE to partner with the Office of the President to develop high-impact, implementable solutions for ICT in education.

South Africa and ICT in Education: A Rationale for Action

With the goal of developing a strong implementation strategy for ICT in education, the government of South Africa adopted a problem-solving lab methodology, initially developed by the governments of the United Kingdom and Malaysia and recently used in countries such as Tanzania and the United States. Known as Operation Phakisa in South Africa, this “Big Fast Results” (BFR) methodology has been adapted and used by two other Government departments: the Department of Environmental Affairs and Department of Health. In 2015, the DBE worked with World Bank Innovation Lab experts to improve and customise the methodology specific to the education sector’s challenges. To begin this process, DBE, Operation Phakisa, and the World Bank partnered to identify key challenges in the education sector for which ICT interventions might prove transformative, using a unique Challenge Scoping Lab process. In mid-2015, a four-week BFR, follow on Lab will work toward delivering a detailed “3-foot” implementation plan for using ICTs to effectively take on critical challenges within the education section.

Understanding the challenges most critical to education requires clarifying opportunities and constraints confronting those individuals who use the education system (e.g., learners, parents, etc.), those responsible for implementing education programs (e.g., teachers, provincial administrators, teachers’ trainers), and other stakeholders (e.g., technology firms, unions, etc.). As described in the Executive Summary, from 22-26 June 2015, ten education professionals (the “core 10”) worked to understand the needs of these stakeholders and—by comparing these insights to systematic challenges identified by education experts—identify the most important problems facing the sector. The core 10 then worked with 30 additional stakeholders (for a total of 40 people), including private sector, unions, and additional individuals from across South Africa’s provinces from 29 June-1 July to develop additional insights that could lead to key “starting challenges” that the forthcoming BFR Lab on ICT and education will take on.

The Challenge Scoping Lab’s goals were to clarify the thematic scope of the BFR Lab—what problems should be prioritized—and identify key challenges to spur solution generation. These challenges would inform finalisation of the work streams to be used to develop and hone solutions during the BFR Lab. Beyond identifying challenges to be taken on in the BFR Lab, a goal of this Scoping Lab was to continuously engage groups of participants who will serve as focal actors in the BFR Lab. To this end, the core 10 saturated themselves in information on challenges facing education and shared insights with the broader group of 40. Together, these groups will serve as a “golden thread” that weaves the findings and essential information into the BFR Lab. In the following section, find information on the Scoping Lab’s methodology and tools leveraged toward identifying insights and starting challenges.
Section II: Approach and Methodology

Members of the core 10 and GTAC facilitators explore observations on private sector needs during the Challenge Scoping Lab’s first week. Photo: GKI
Challenge Scoping Lab Approach and Methodology
The Challenge Scoping Lab laid the groundwork for the BFR Lab by first exploring problems within the education sector and then identifying those key challenges that establish the strongest focal points for action in the BFR Lab. In doing this, the Scoping Lab used a number of processes and tools described in this section. Below, find a description of where the Scoping Lab fits within the BFR process, followed by a description of the thinking that inspired the Lab’s design. Following these contextual overviews, find a description of the activities conducted and tools used in the first and second weeks of the Lab, which is followed by lessons learned from this process, including strengths and limitations of the process.

The Scoping Lab’s Place in the BFR Process
The Challenge Scoping Lab focused on exploring problems and identifying key challenges. Figure 4 portrays the participants’ journey within the Challenge Scoping Lab and what they will experience following the Lab. To begin, participants diverged (“Explore the problem”) and came up with numerous problems facing education. They then analytically converged (“Identify key challenges”) on those problems that DBE should consider taking on in the BFR Lab. In the BFR Lab, the larger group will again diverge while developing numerous possible solutions (“Develop solutions”) and then converge on those solutions that must be implemented (“Implement solutions”). This will become the ICT in Education “3-foot plan”. The Scoping Lab, then, is a pre-cursor to the BFR Lab, and—through the development of key challenges—will allow BFR Lab participants to efficiently and effectively develop high-impact solutions.

Figure 4. The Challenge Scoping Lab uncovers problems and converges on key challenges; the BFR Lab ideates solutions, and then converges on specific solutions to implement.

Approaches used in developing the Scoping Lab
In diverging and then converging on complex challenges facing education sector actors, participants embraced an approach inspired by two broad perspectives:

- **User Design:** Also known as “human-centered design”, and emanating from the broader field of Service Design, User Design focuses on learning about the needs, fears, hopes, and desires of users (in this case, students and teachers) and stakeholders (e.g., provinces, unions, and private sector) relevant to solutions. It is an innovation methodology used by program designers and service-providers from private, public, and NGO sectors and is effective when designing holistic solutions to complex challenges that involve individuals and communities. To effectively understand user and stakeholder perspectives, it is essential to speak to and empathize with these individuals. Over the eight days of the Scoping Lab, participants heard perspectives from over 40 users and stakeholders.
• **Innovation Systems**: “Innovation systems thinking” accounts for the various actors, incentives, enablers, and other factors within a system that support or hinder innovation. A systems mindset helps when dealing with the complexity of understanding challenges and designing solutions for the myriad of actors within the education space.

**Lab Participant Backgrounds and Roles**

Taking on the task of understanding user needs, and identifying starting challenges for the BFR Lab, were a group of key education stakeholders. The DBE chose two groups of individuals based on their relevance to ICT in education. Participants in a core group of ten people (the “core 10”) represented DBE, provincial governments, DTPS, and DST and participated in both weeks of the Scoping Lab, starting 22 June. Participants in a larger group of 40 (inclusive of the core 10) represented a broader group, including individuals from private sector, unions, NGOs, as well as eight of South Africa’s nine provinces (Limpopo was invited, but did not attend). These individuals joined the Lab’s second week.

The main role of Lab participants was to act as champions of user and stakeholder perspectives in the BFR Lab, in which they are expected to play a leadership position. For the core 10, their role was to become fluent with, and deeply understand, stakeholder observations through field visits, interviews, panel presentations, and other touch points and then share their insights with the full group of 40. This full group captured knowledge from stakeholder research, analyzing and synthesizing stakeholders’ needs to define starting challenges for the BFR Lab.

**Activities undertaken and tools used in Challenge Scoping Lab**

![Figure 5. Focus areas for weeks 1 and 2 of the Challenge Scoping Lab](image)

**Week 1 Overview**

As noted in Figure 5, the first week of the Scoping Lab focused on taking in user and stakeholder perspectives. The core 10 sought to understand user and stakeholder needs and perspectives in basic education by interviewing learners, teachers, and administrators and holding presentations and panel discussions with provincial representatives, private sector, unions, and subject matter experts. They interviewed three subject matter experts on challenges in basic education, three representatives from teachers’ unions, three from provincial governments, and four from private sector. To gain insight from users of potential ICT-based solutions, the core 10 visited two schools: a low income, rural school in North West Province and a higher income private school in Gauteng Province. By interviewing users at each school, participants gained insight on the range of experiences within South African schools. Though
not comprehensive, this provided perspectives that could be used to clarify those challenges most important to learners and teachers. See Figure 6 for a list of stakeholders consulted during Week 1.

Through these interactions, the group explored systemic challenges both in the education sector broadly and in ICT implementation. At the end of the week, the core 10 synthesized observations gathered from the over 30 individuals they interviewed/heard from. They developed insights by analyzing their findings and used these as a basis to develop presentations that they would use the following week to share findings with the larger group of 40 Challenge Scoping Lab participants.

Week 1: Key tools and processes used
Throughout the Scoping Lab, the participants used a number of tools, often iteratively.

Key informant interviews: The core 10 interviewed approximately 15 users at two schools. Facilitators provided templates for asking questions and capturing insights. These templates—and the questions asked—followed best practices from user design and anthropological field research. The core 10 captured observations on pre-templated sticky notes.

Panel Discussions and Q&A: For all expert and stakeholder engagements, panelists first gave a brief presentation and then were asked questions by facilitators. The core 10 wrote observations during the presentation and panel discussion on pre-templated sticky notes. They then worked together in groups to develop key questions to ask panelists.

Grouping observations into themes: Once participants captured observations from the field visit, presentations, panels, and Q&A sessions, they analyzed themes on the level of each stakeholder. Themes in this context are defined as neutral topics that collect a number of findings under one umbrella. These themes organize and simplify large amounts of information. Groups voted on themes that they deemed most important, given what they had heard.

Identifying key insights out of themes: Once the core 10 had converged on the most important themes, they described and clarified insights emanating from these themes. Insights in this context are the rationales, or “why’s”, behind a stakeholder’s behavior, including motivations or needs that people do not express directly, but which we infer. The insights the core 10 identified made up the bulk of their presentations in the second week.

Week 2 Overview
The second week of the Challenge Scoping Lab began with the core 10 sharing their insights with the larger group of 40, who noted points they found important, discussed key issues, and eventually synthesized observations into starting challenges for the BFR Lab. 29 July focused on presentations by the core 10 members on user and stakeholder perspectives, while the 30th and 1st involved vigorous discussion, honing of thematic areas that had come to the fore throughout the process and developing potential starting challenges. Throughout this process the 40 people, who were split into six working groups, captured
observations and questions from presentations and discussions. They used these observations to develop potential starting challenges for the BFR Lab. Upon developing starting challenges, participants tested the vigor of these challenges by ideating potential solutions, using the challenges as starting points. A sample of these potential solutions is available in Annex III.

Following the close of the Scoping Lab on 1 July, the World Bank team synthesized outputs from both weeks of the Lab and—building off of challenges developed by the group of 40—honored 46 potential starting challenges for the BFR Lab, including four prioritized challenges for each key user/stakeholder group. This list can be found in the Executive Summary or in Section III.

**Strengths and Limitations of process**

Strengths and limitations exist both for the approach methodologically and in terms of what happened in the preparation for this workshop, which informed the methodology. In Section IV, find details of lessons learned from the Challenge Scoping Lab methodology generally, including positive and negative participant feedback. This section instead focuses on the strengths and limitations of the tools used.

**Strengths of this approach**

- **User perspectives guide challenge identification**: The user centered design focus of this methodology ensured that user and stakeholder perspectives would guide challenge development. While secondary research is important for understanding broad trends, to understand what users and stakeholders need, it is best to speak with them directly.
• **More inclusive and thorough than common approaches to identifying starting challenges:** Many strategy design processes assume that experts already know what challenges are most important to users. Challenge identification can often take the form of arguments among experts without the benefit of user input or stakeholder consultation. This process was more thorough and inclusive than challenge identification processes often used in BFR-style workshops.

• **Develops core group of people at multiple levels to lead in the BFR Lab:** By sensitizing a “golden thread”, inclusive of the core 10 and full group of 40 to user needs, this methodology develops a shared sense of the challenge space and champions ready to take this thinking into the BFR Lab.

• **Provides a safe space for stakeholders to engage with government and each other:** By facilitating discussion and debate, and setting ground rules that respect stakeholders’ views and needs, this methodology creates a space in which stakeholders from government and outside of government can find alignment on shared challenges while understanding each other’s differences.

In general, by engaging users and stakeholders directly, and allowing these users and stakeholders to share their views without judgment, this Challenge Scoping Lab developed starting challenges that can lead to effective solutions. This methodology creates a high probability of good ideas and implementable, but catalytic, solutions for the BFR Lab.

**Limitations**

• **Limited user engagement:** Due to limited time for planning and execution of the first week of the Lab, there was limited opportunity to engage with learners, teachers, and administrators. For participants to get a more helpful sense of user needs, it would have been better to speak with a more of these individuals. Thus, the external validity of the information gathered from interviews may be limited. This relates to larger issues described in Section IV but is a limitation of the approach taken.

• **Focus on education challenges generally rather than ICT in education:** Because the Lab focused on education challenges broadly—as well as ICT challenges that were essential to education—rather than constraining the scope to ICT challenges, it necessarily would produce starting challenges broader than just ICT for education. Depending on perspective, this could be perceived as a feature or a limitation; however, in interviews with education stakeholders while organizing the Scoping Lab, the Lab designers heard many times the need to use ICTs to take on structural challenges and not just focus strictly on ICT-based challenges.

• **Focus on user/stakeholder needs rather than expert insights:** The Scoping Lab pulled information from users and stakeholders, including education experts early in the first week of the Lab. The perspectives taken by members of the core 10 and broader group of 40, though, were those of users and stakeholders. This is necessary when working to understand what challenges these individuals truly experience. Thus, expert opinions were largely left out of the discussion. While this allows for a clear focus on user/stakeholder needs, it can be frustrating to participants. It also may miss some previous research that has aggregated user/stakeholder information.
Section III: Key Challenges in South African Education

Starting Challenges and Lab Content
Starting Challenges from the Challenge Scoping Lab

The Scoping Lab produced a number of outputs, however, most important to the BFR Lab are the starting challenges conceptualized in rough form by the group of 40, then further honed by World Bank facilitators. The facilitators used both the challenges developed by the 40, and their own insights based on perspectives expressed during the Lab, to develop the full list of challenges. Challenges that participants voted as particularly important are highlighted starting on page 24, followed by a full list of starting challenges derived from the Scoping Lab starting on page 32. The DBE and Operation Phakisa can use the list of challenges, which can also be thought of as “design principles,” as starting points for generating ideas and solutions in the BFR Lab. These starting challenges may also influence the DBE’s choice of Work Streams for the BFR Lab.

While these challenges described in this section come from the perspectives of all stakeholders interviewed—learners, unions, etc.—many challenges focus specifically on the experiences and needs of learners and teachers, the most critical actors in educational development. Learners and teachers face a myriad of needs: access to the internet for students, ability to get their work done within the allotted time for teachers, and similar daily, continuous challenges. Many of these challenges focus on making learning more effective and improving the lives and working conditions of teachers. These challenges do not necessarily map to specific ICT interventions, but many of them could be taken on through smart use of ICTs.

Beyond learners and teachers, many challenges speak to the need for better coordination between key actors (e.g., government, provinces, unions, etc.) and for stronger policy implementation by the DBE. Because many of the proposed challenges focus on issues that are quite elemental (e.g. the need for textbooks) or at a high level (e.g. policies based on research), this suggests potential modifications to the Work Streams planned for the BFR Lab. Possible additional Work Streams are described after an overview of starting challenges.

Note: All photos in this section are used through Creative Commons unless otherwise noted.
Stakeholder: Learners

Learners need support that will allow them to succeed in school and find meaningful employment as adults. In a country where nearly 54% of youths are unemployed, students require skills; professional, caring teachers; a safe environment in which to study and learn; and the resources (e.g., textbooks, ICT tools, internet, and others) needed to study and learn (World Bank 2015). Learners have little control over their situation—they must rely on teachers, parents, and administrators to organize and improve their educational context—however, they do have insights about what would help them. Increasingly tech savvy, and unshackled by tradition and protocol, students may have the insights needed to create solutions for the education sector. On the following page, find the top four challenges from voting. The full list of starting challenges for learners is available on page 32.
Top challenges: Learners
Below find four of the nine starting challenges for learners. These were voted as important by workshop participants.

**Starting Challenge:**
How might we design a solution that allows learners to develop holistic skills that prepare them to be successful in the future?

**Insights:**
- Learners need academic, spiritual/value and physical development
- Learners need to learn problem solving and independent thinking skills
- Learners want to be prepared for life after school in various ways

**Starting Challenge:**
How might we design a solution that allows learners to access a range of subjects that cater to their future career choices?

**Insights:**
- Learners need vocational learning opportunities
- Learners want school to prepare them for the future
- Clear career vision influences learners’ mindsets as they have a goal and want to achieve well

**Starting Challenge:**
How might we design a solution that allows learners to have a safe environment that keeps them engaged and protects them from the ills of society?

**Insights:**
- Learners need schools which will give learners a sense of security
- Learners regard schools as a safe haven from drugs and crime

**Quote:**
“A school that has a system of discipline that has consequences is a good school”

**Starting Challenge:**
How might we design a solution that allows learners to have teachers that are prepared and committed to quality teaching?

**Insights:**
- The best teachers are those with good relationships with learners
- Learners feel inspired and cared for by committed teachers
Stakeholder: Teachers

With an expansion of the number of learners receiving schooling over the past decades, South Africa’s teachers have faced new challenges and very heavy workloads. To provide learners the quality training they need, teachers require support on challenges having to do with their complex, dynamic workloads; confidently and effectively integrating ICTs into learning; finding the right information and sharing it with other teachers; and training in resource-constrained environments. Related to these challenges, teachers must feel support from their community and society at large; they shape the next generation of South Africans, and society should recognize their importance and hard work. On the following page, find the top four challenges from voting. The full list of starting challenges for teachers is available on page 32.
Top challenges: Teachers
Below find four of the 11 starting challenges for teachers. These were voted as important by workshop participants.

**Starting Challenge:**
How might we design a solution that allows teachers to efficiently and effectively deal with their workload?

**Insights:**
- Teachers cannot complete curriculum requirements and knowledge gaps arise
- When there are too many learners in a classroom, teachers struggle and pass rates are affected
- Teachers feel that there is too much administrative paperwork, leaving less time to meet other deadlines

**Quote:**
“When you see learners progress, you feel satisfied.”

**Starting Challenge:**
How might we design a solution that allows teachers to feel valued in their profession?

**Insights:**
- Teachers do not receive training on the many additional support roles they have to play to meet learners’ needs
- Teachers feel unrecognized by society for the multiple roles they play in society
- Pay structure does not reflect the importance of the job

**Starting Challenge:**
How might we design a solution that allows teachers to access tools and technologies to enhance learning by learners?

**Insights:**
- Teaching and learning are affected by the limited number of teaching materials available for students
- The few teachers who use ICTs value them because they make lessons more interesting for learners
- There are not enough computers functioning for teachers to teach with or for learners to use

**Starting Challenge:**
How might we design a solution that allows teachers to have regular, sustained support to use ICT for teaching?

**Insights:**
- Teachers need to develop ICT skills, such as converting traditional lessons into ICT-based lessons
- Many teachers do not know how to use ICTs effectively and require training in how to operate and apply them in a learning environment

**Quote:**
“Children are more attentive when we use ICTs.”

Photos: The World Bank
Stakeholder: Provinces

South Africa's nine provinces face unique challenges and have unique needs. However, all need national support for teacher training, ICT implementation and integration, ICT funding, and a host of other needs. On a broader level, provinces want stronger collaboration with the national government and leadership on education policy, inclusive of norms and standards. As implementers of the national government's policies, they need the resources and support to implement these policies well and consistently. On the following page find the top four challenges from voting. The full list of starting challenges for Provinces is available on page 33.
**Top challenges: Provinces**
Below find four of the 13 starting challenges for provinces. These were voted as important by workshop participants.

**Starting Challenge:**
How might we design a solution that allows for dedicated national senior leadership to champion the vision for ICT in education?

**Insights:**
- The DBE should share their dream/vision for ICT in education
- Provinces need an ICT roadmap communicating policy imperatives

**Starting Challenge:**
How might we design a solution that allows provinces to ensure that accredited training is delivered to teachers?

**Insights:**
- Professional development is currently ad hoc and often unaccredited
- There is a lack of sustainable programmes for teacher training
- Teachers need to be able to earn Continuous Teacher Professional Development (CTPD) points

**Starting Challenge:**
How might we design a solution that allows for ongoing coordination between all relevant implementers (gov’t, service providers, NGOs, etc.) at provincial and national levels?

**Insights:**
- Poor management at all levels hinders effective collaboration and delivery of projects
- Clear strategic intent is achieved through consultation with stakeholders

**Starting Challenge:**
How might we design a solution that allows provinces to have additional, adequate, ring-fenced funding for ICT initiatives?

**Insights:**
- Failed initiatives are costly to Provinces
- ICT projects are characterised by fragmented and episode-based investment and implementation
- Funds are needed to sustain hardware/software and to hire technicians for back up support

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**Important**

**Critical**
Stakeholder: Unions

Unions hope to see realistic, implementable policies relating to school teachers from the national government and the ability to work with government to develop these policies. As representatives of South Africa’s teachers, unions need improved quality of life and recognition of teachers as well as opportunities for teachers to access high-quality, accredited training programs. Many of the unions’ requests are from government: for better policies, a corruption-free procurement system, improved consultation, and support for teachers. On the following page find the top four challenges from voting. The full list of starting challenges for unions is available on page 33.
Top challenges: Unions
Below find four of the eight starting challenges for unions. These were voted as important by workshop participants.

**Starting Challenge:**
How might we design a solution that allows teachers to gain confidence in relevant ICT skills through professional training?

**Insights:**
- Unions support the use of ICT to improve the relevance and quality of the education system
- Teachers are often intimidated by the knowledge gap between them and learners in using ICTs

**Quotes:**
"The Teacher laptop initiative was a robbery gone bad."

**Starting Challenge:**
How might we design a solution that allows teachers to access regular, accredited, professional development that is customized to individual teacher needs?

**Insights:**
- Training of teachers should be based on empirical evidence
- A high standard of quality should be expected in the training offered to teachers (accredited programmes such as Education, Training and Development Practices and South African Council for Educators)
- Teachers need to receive ongoing training and support

**Starting Challenge:**
How might we design a solution that allows unions to be consulted regularly by the government on policies that impact teachers?

**Insights:**
- Negotiated agreements are often changed at the implementation stage
- Some of the forums for engagement are non-functional, such as the Education Labour Relations Council
- Unions need consistent, open communication on policy issues

**Starting Challenge:**
How might we design a solution that allows unions to see evidence of realistic policy making through researched, evidence-based design?

**Insights:**
- There is a tendency to pursue aspirational planning instead of strategies based on empirical evidence
- There exists a lack of learning from previous mistakes to prevent recurrence
Stakeholder: Private Sector

Private sector needs are relatively simple compared to other stakeholder groups. Fundamentally, private sector firms need to make a profit. To do so in supporting ICT in education, though, they need a number of conditions to be in place. Although firms can make some money on short-term, “dump and run” technology programs; it is better for them to engage in long-term partnerships with Government. For these sustainable partnerships to work, the Government should be clear about what functions must be performed by the technology, rather than simply looking at what technology is available or available at the best price. Firms further need procurement systems to be clear and fair and specifications for technology used in tenders to follow clearly identified needs. On the following page find the top four challenges from voting. The full list of starting challenges for private sector is available on page 33.
Top challenges: Private Sector
Below find four of the six starting challenges for private sector. These were voted as important by workshop participants.

Starting Challenge:
How might we design a solution that allows the private sector to engage with the government on long-term, profitable/sustainable ICT initiatives?

Insights:
- There is no clear coordination across interventions in the country
- There should be clearer distinctions between the roles of stakeholders and how consultations take place
- Short term, near-sighted projects do not benefit government or private sector in the long term

Starting Challenge:
How might we design a solution that allows the private sector to focus on delivering solutions to learner needs first rather than ICT needs?

Insights:
- Educational needs should drive all investments in ICT procurement
- There is no lack of alignment between education policies and the curriculum being taught
- Total cost of ICT ownership must be understood

Starting Challenge:
How might we design a solution that allows the private sector to engage in a transparent and corruption-free tender system with clear specifications?

Insights:
- Public-Private Partnerships must be built on transparency
- DBE should be very clear about what it needs, and ensure that tender language expresses that, rather than writing tenders based on what is available in the market

Quote:
“Awarding a tender to one highest scoring bidder is not good to both industry and education.”

Starting Challenge:
How might we design a solution that allows the private sector to develop ICT solutions based on clearly defined education goals and needs?

Insights:
- Value for money on initiatives should be based on empirical research
- A clear ICT vision and policy allows the private sector to support goals and meet expectations

Quote:
“We can’t make sense of the policies that are in place.”
Full List of Challenges

Below, find a list of all proposed starting challenges, inclusive of the top challenges explored above. In Annex II, find a list of all starting challenges organized by their proposed work stream.

Learner Challenges

Top Challenges: How might we design a solution that...
- Allows learners to have teachers that are prepared and committed to, quality teaching?
- Allows learners to have a safe environment that keeps them engaged and protects them from the ills of society?
- Allows learners to access a range of subjects that cater to their future career choices?
- Allows learners to develop holistic skills that prepare them to be successful in the future?

Additional challenges: How might we design a solution that...
- Allows learners to feel like teachers care for their well-being?
- Allows learners to be inspired by real, tangible examples of people who found success through schooling?
- Allows each individual learner enough time with learning resources (e.g. textbooks) to complete their daily after school studies?
- Allows learners to find quality information to make informed decisions about their careers?
- Allows learners to have regular, predictable access to the internet (to enable research and learning)?

Teacher Challenges

Top Challenges: How might we design a solution that...
- Allows teachers to have regular, sustained support to use ICT for teaching?
- Allows teachers to access tools and technologies to enhance learning by learners?
- Allows teachers to feel valued in their profession? (Shared Challenge: Also a Challenge for Unions)
- Allows teachers to efficiently and effectively deal with their workload?

Additional challenges: How might we design a solution that...
- Allows teachers to be supported by a community of peers for learning and sharing?
- Allows teachers to be supported in the multiple roles they must play?
- Allows teachers to access tools and technologies to make teaching easier?
- Allows teachers access to adequate textbooks and other teaching resources?
- Allows teachers to feel confident in using ICTs?
- Allows teachers to have regular, sustained training and support to provide holistic education?
- Gives teachers clarity on which methods to use and how to use them to teach 21st century skills?
Province Challenges

Top Challenges: How might we design a solution that...
- Allows provinces to have additional, adequate, ring-fenced funding for ICT initiatives?
- Allows for ongoing coordination between all relevant implementers (e.g., government, service providers, NGOs, etc.) at provincial and national levels?
- Allows provinces to ensure that accredited training is delivered to teachers?
- Allows for dedicated national senior leadership to champion the vision for ICT in education?

Additional challenges: How might we design a solution that...
- Allows schools to ensure enough of the right teachers to fill subject area needs?
- Allows for stable and ongoing senior provincial leadership dedicated to ICT in education?
- Allows provinces to buy into have a clear national vision for ICT in education, and specific roll-out plans that relate to individual provinces?
- Allows for un-fragmented implementation of long-term, sustainable ICT solutions at school level?
- Allows provinces to have clear norms and standards on how to engage with service providers in implementing national plans?
- Allows each school sustained access to the resources necessary for ICT support and maintenance?
- Allows all schools in every province connectivity to the internet for teaching, learning, and administration?
- Allows provinces to be fully aware of clear norms and standards on teacher training in ICTs?
- Allows provinces to incentivize teachers to undergo ICT training?

Union Challenges

Top Challenges: How might we design a solution that...
- Allows unions to see evidence of realistic policy making through researched, evidence based design?
- Allows unions to be consulted regularly by the government on policies that impact teachers?
- Allows teachers to access regular, accredited professional development that is customized to individual teacher needs?
- Allows teachers to gain confidence in relevant ICT skills through professional training?

Additional challenges: How might we design a solution that...
- Allows both urban and rural schools to access the unique teaching and learning resources they need?
- Allows unions to trust that public education will remain free, of high quality, and without commodification?
- Allows unions to have trust that government procurement systems and processes are corruption-free and accountable?

Private Sector Challenges

Top Challenges: How might we design a solution that...
- Allows the private sector to develop ICT solutions based on clearly defined education goals and needs?
- Allows the private system to engage in a transparent and corruption free tender system with clear specifications?
- Allows the private sector to focus on delivering solutions to learner needs first rather than ICT needs?
- Allows the private sector to engage with the government on long-term, profitable/sustainable ICT initiatives?

Additional challenges: How might we design a solution that...
- Allows the private sector to make a sustainable profit?
- Allows the private sector to avoid one off involvement in ICT projects?
Proposed Work Streams for BFR Lab

Work Streams are thematic areas within the BFR Lab in which working groups will develop solutions and then plan for implementation (Work Streams were used for this purpose in both previous South African BFR Labs). Currently planned Work Streams represent priorities for ICTs in Education identified by the Government of South Africa. Currently planned Work Streams include:

- Digital Content
- Infrastructure
- Connectivity
- Teacher Professional Development
- E-administration

In analyzing the multitude of challenges and insights that emerged through the Challenge Scoping Lab, and specifically due to the systemic issues raised, we suggest modifications to Work Streams. From participant feedback it appears that there are high level challenges that inform decision-making broadly, and indeed on the existing Work Streams. Rather than falling within the initially designed Work Streams, some challenges map better to the following higher level themes. See below for a list of suggested new Work Streams:

- Leadership in Education (includes policymaking and management of education)
- Support for Learners (includes curriculum and learning environment)
- Resource Procurement
- Collaboration on Education.

Beyond these additional Work Streams, Teacher Professional Development may be a limiting category, because of the varied human resource needs in the education sector. Rather, a more ample category on Human Resources can cover needs for teachers as well as administrators, ICT technicians, and other related needs. See below for a visualization of how high-level Work Streams relate to more ICT-specific Work Streams and how cross-cutting Work Streams can improve solution development across all high level and ICT-specific Work Streams. In the following pages, find all starting challenges, organized by the Work Stream(s) with which they most closely align. Note that in Fig. 7, colors for Work Streams match those used in the full list of starting challenges and Work Streams in Annex II.

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Fig. 7. Relationship between proposed BFR Lab Work Streams
Section IV: Learnings from Challenge Scoping Lab Process
At the end of the Challenge Scoping Lab, facilitators conducted evaluations with participants via a survey, and the core 10 and Lab organizers at DBE, Operation Phakisa, and GTAC using a facilitated feedback process. The facilitators conducted these feedback sessions for two reasons: (1) insofar as part of the Scoping Lab’s purpose is to gain buy-in from key participants, it is essential that we measure how they feel about the process; (2) because this is the first time that Operation Phakisa has used a challenge scoping methodology, it will be helpful in future iterations of the BFR Lab process to see how participants viewed the strengths, weaknesses, and opportunities associated with the process. In this section, find a summary of feedback from survey respondents, followed by lessons learned on the Scoping Lab process, and potential directions forward based on the content of proposed challenges and Work Streams.

**Lab Participant Feedback**

Following the final day of the Scoping Lab, facilitators gave workshop participants a post-event survey. It asked eight questions, which are written in the box at right. 27 out of approximately 40 participants answered this survey and provided a rough sense of how participants experienced the Scoping Lab process.

The main, high level finding is that participants found the Scoping Lab overwhelmingly effective in clarifying what challenges the BFR Lab should take on. 90% of respondents found the process “effective” or “very effective” at clarifying challenges.

**Questions asked in post-event evaluation**

1. What did you learn from the pre-lab?
2. On a scale of 1-5, how effective was this pre-lab in clarifying challenges for the BFR lab?
3. What was most helpful about this process?
4. What would you change about this process?
5. Did this pre-lab change your thinking at all?
6. If so, how did it change?
7. What would you like to see as an outcome from this pre-lab?
8. Please feel free to write any feedback.

**Figure 8. On a scale of 1-5, how effective was this pre-lab in clarifying challenges for the BFR lab?**

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Effective</td>
<td>38%</td>
</tr>
<tr>
<td>Effective</td>
<td>52%</td>
</tr>
<tr>
<td>Fair</td>
<td>10%</td>
</tr>
<tr>
<td>Ineffective</td>
<td>0%</td>
</tr>
<tr>
<td>Very Ineffective</td>
<td>0%</td>
</tr>
</tbody>
</table>
As can be seen in Figure 9, participants appreciated the methodology employed, noting the multi-stakeholder engagement prioritized in the event. Respondents noted the inclusive nature of the discussion and the freedom with which they could communicate their views with individuals from other sectors, with whom they might rarely meet.

In terms of areas for improvement, while the largest group of respondents said that nothing should change about the methodology, most other respondents suggested better use of data/stakeholder insight. This theme was also underscored during debriefing sessions with the core 10 and event organizers from the Government and World Bank, and is discussed in more detail in the following section. Further information on participant feedback can be found in Annex III.

Lessons learned from Challenge Scoping Lab Methodology
Following the Challenge Scoping Lab, the World Bank team facilitated debriefing sessions with the core 10 and with the Scoping Lab management team (including representatives from DBE, Operation Phakisa, and GTAC). These meetings provided insight on what worked well and what could be improved about the Scoping Lab process. In this section, find lessons learned based on these debriefing sessions, starting with those elements found to be most positive or helpful.

What worked well in Challenge Scoping Lab:

- **Stakeholder input was used well**: Core to the Scoping Lab’s design was input from users and stakeholders. Although there was concern about the number of learners, teachers, and principals interviewed (see next section), users and stakeholders from key sectors were given the opportunity to openly share their needs and perspectives.

- **Exploratory mindset was helpful**: Although uncomfortable at times, the process of diverging and converging on problems in education gave participants a broad sense of challenges and the ability to prioritize those that were important. This exploratory mindset also freed stakeholders to provide opinions and feedback that might have been contentious in a less structured environment.

- **Good teamwork by participants**: Both the core 10 and the working groups used during the second week of the Scoping Lab effectively and collegially worked together. Despite taking on a new, unfamiliar process, they enthusiastically engaged on challenges in the ICT sector.

- **Firm, professional facilitation**: During debrief meetings, members of the core 10 spoke to the professional, prepared nature of the facilitation. The highly structured workshops were completed within the available time and reached their intended goals without needing to cut any activities.

- **Strong methodology and tools/templates**: The methodology for this experience, designed specifically to reach the set goals and for the participants and time available, effectively produced needed outputs. Participants in debrief meetings also noted the quality and usefulness of templates developed for the workshops.
Risks and Limitations:

- **Some participants found the process confusing:** While post-event surveys showed that the majority of participants found the Scoping Lab process helpful at its close, some were frustrated during the event due to a weak understanding of how the methodology worked. Some also wanted additional clarity on what the outcomes of the event might be. Members of the management team were concerned both by the lack of information early on from the World Bank about the methodology and on the perceived inflexibility on the part of facilitators before and during the event.

- **Need for additional research:** Members of the core 10 and Government expressed concern about how user/stakeholder perceptions were used compared to participant expertise and background research. While some were uncomfortable that participant expertise was used to a limited extent, and instead that perspectives of users/stakeholders were prioritized, others noted that too few users (e.g. schools, learners, etc.) were consulted. They contended that secondary research and expertise did not sufficiently influence the Lab, and too few users were consulted to reach conclusions.

- **Representation and participation:** Due to the short time to prepare for the Scoping Lab, invitations did not reach some participants until directly before they were expected at the event. While participants received apologies for the urgent invitation, some remained frustrated. Similarly, some provincial officials charged with identifying staff members to join the Lab either were not adequately briefed or failed to share information with participants. Thus, critical briefing information did not reach participants.

In terms of representation, by necessity, not all relevant stakeholders could be included as participants in this stage of Operation Phakisa; though some Lab participants were concerned about how representatives were chosen. Many of the relevant institutions that could not be included in this process will be members of the full BFR Lab, however, it is not clear whether Scoping Lab participants understood the tiered approach in which additional stakeholders are added as the process continues.

- **Challenging preparatory phase:** Preparing for the Scoping Lab proved difficult for various reasons. The World Bank and DBE/Operation Phakisa did not have a written agreement on the scope or design of the Lab, which necessitated substantial discussion between the World Bank and Government teams on design. This caused misunderstandings about the structures to be used in the Lab, including the extent to which there was room for modification of core processes in the BFR methodology. This lack of agreement on scope, combined with deadlines for starting the Lab meant that both the Government and World Bank had substantially less time to prepare than was needed when they finally reached agreement on Lab design. A short preparatory time created a situation in which professional, vetted facilitators were difficult to recruit, and, while facilitators were recruited by the World Bank and availed by GTAC, there were fewer than expected, which put additional strain on the process.

- **DBE leadership:** While the DBE successfully managed logistics for the Scoping Lab, it faced numerous challenges in doing so. These included a lack of direct involvement from high-level officials within the Department and limited staff availed for organizing the Lab in what ended up being an extremely short preparatory period. Without a strong project management team, individuals had to take on difficult workloads in order to ensure that preparations for the Scoping Lab were in place.

Opportunities for improvement of process:

Opportunities for improvement of the Scoping Lab process have been identified during debriefing sessions and can inform future exploratory labs conducted by the World Bank, Operation Phakisa, or other institutions. Learnings from this Lab should also inform the BFR Lab to be conducted later in 2015.
• **Participant recruitment and preparation:** Participants in Scoping Labs should be well briefed. The Scoping Lab process is difficult and can be frustrating in the best of circumstances. However, if participants have a sense of what will happen at the outset, it may alleviate frustrations and anxieties. Although, by definition, small groups cannot include representation from everyone important, if broader representation cannot be achieved in settings such as the second week of the Scoping Lab, participants should also be made aware of why certain stakeholders were not included. Finally, they should also be clear about how different groups will engage in the larger BFR Lab.

• **Information inputs to Scoping Lab:** Two broad challenges faced ensuring the right inputs to the Lab: one was that experts felt frustrated that they could not share their expert opinions, and instead were asked to take on the perspectives of users. This made them feel like their knowledge was being ignored. This approach, however, is necessary for understanding what users think of their needs. Expert views are helpful in designing solutions, and understanding the macro context of challenges. However, they are not more helpful than users/stakeholders in knowing what users themselves think. Thus, some frustration is necessary and should be alleviated by clearly explaining the process and how participant expertise can be used later in the process.

The other issue, which should be directly taken on in future Scoping Labs, is the number of users interviewed. While helpful, the learners, teachers, and principals that the core 10 spoke with are not representative of learners, teachers, and administrators across South Africa. It was impossible in this Lab to consult more users because of time, however, in future labs, more users should be consulted.

• **Clarify how Scoping Labs fit into BFR methodology:** Because Challenge Scoping Labs were not included in earlier versions of the BFR process, it is not yet clear how best they can support the process. In future Operation Phakisa exercises, organizers can make choices early on how Scoping Labs will support the BFR process more broadly, including mechanisms for transferring knowledge and outputs from the Scoping Lab to the BFR Lab. These mechanisms can be shared with Scoping Lab participants, giving them confidence about how their input will be used later in the process. A plan for how the Scoping Lab fits with the BFR Lab will also allow for the Government and implementing partners to agree early on the Lab’s methodology, rather than developing it through discussions.

In the case of the current BFR Lab, steps should be taken to ensure that outputs of the Scoping Lab effectively feed into the BFR Lab. Members of the core 10 and larger group of 40 must be used effectively in preparing for the BFR Lab, so that their expertise and experience can provide a “golden thread” between labs.

• **Define Scoping Lab management structure:** Insofar as Operation Phakisa is by definition a mechanism to “hurry up” the policymaking process, those charged with implementing in Cabinet Departments should take this mindset in organizing activities associated with BFR. This means ensuring clear management structures, prioritizing efficient communication, planning for sufficient numbers of staff members on planning and logistics, and building in accountability for results up the entire chain of command. Protocol should be minimized for design processes, such as this, to be effective. Running a BFR with a “business as usual” mindset will rob the process of its power.

**Considerations for BFR Lab based on Starting Challenges**

Starting challenges described in this report represent the input of Scoping Lab participants, based on what they heard from representatives of user/stakeholder groups, which were subsequently clarified and honed by World Bank facilitators. While not comprehensive, these challenges represent the views and needs of core groups. These should be taken seriously when determining how best to orient the BFR Lab. See below for considerations for the BFR Lab based on these challenges.
Potential uses of starting challenges

Starting challenges can be used in a number of ways in the BFR Lab. One approach is to consider them specifications for possible solutions (i.e. to be effective, solutions would need to answer the questions posed by starting challenges). Idea generation then takes place around these challenges, with participants developing possible solutions. This does not need to be how all challenges are used, however. Some may be judged as outside of the direct scope of the Lab. For challenges both judged by Scoping Lab participants to be important and by BFR Lab organizers as outside the BFR Lab’s scope, organizers can use them as “influencing” challenges. These are not starting points for idea generation, but they help guide decision-making on solutions by testing the potential efficacy of a proposed solution. See Fig. 10 for an example of how this process might work.

It stands as essential to determine—based on DBE priorities, Work Streams, Operation Phakisa methodology, and participant input—which challenges should be used as core starting challenges for the Lab and which should be used as challenges that will influence solutions. Once this is clear, processes can be designed to explore solutions. The BFR Lab should use processes that allow for fully exploring ideas and potential innovations and for aligning incentives of different stakeholder groups. These processes should encourage creative solutions that take on multiple challenges and which can improve the lives of different stakeholder groups associated with the education sector.

Implications for Work Streams

As noted, Work Streams guide solution generation in the BFR Lab process. The DBE should consider whether Streams initially designed for the BFR Lab remain appropriate, or if new Work Streams proposed in this document can substitute for some initial Streams. It may not be possible to include a total of nine Work Streams—if that is the case, BFR Lab organizers should prioritize those that seem most appropriate given the Scoping Lab process, top starting challenges, and other considerations. Note, however, that some of the narrower, more technology-focused Work Streams that existed before the Scoping Lab process may preclude creative solutions. On the other hand, many challenges raised by stakeholders in areas such as Leadership in Education or Collaboration could be taken on by ICT-based solutions such as those envisioned in the initial Work Streams.

Note that only challenges within the Work Streams—Human Resources, Support for Learners, Resource Procurement, Collaboration in Education, Leadership in Education, and Digital Content—relate to those challenges voted by participants as most important. In other words, no top voted challenges directly relate to Infrastructure, E-Administration, or Connectivity. BFR Lab organizers should consider the extent to which Work Streams and starting challenges should be ICT based or be education challenges to be solved through ICT solutions. It is meaningful that most stakeholder groups did not pick ICT challenges as most important, even during an event aimed at developing ICT solutions to education challenges. Organizers should clarify whether the BFR Lab is designed to fix problems in ICT, or use ICT to fix problems in education. The latter meets the needs of many stakeholders and is how the Scoping Lab was planned. However, if BFR Lab organizers want to fix problems in ICT for education rather than take on these bigger issues through ICT solutions, this would imply taking a different orientation than that used in the Scoping Lab process.
Mariko Takeuchi (World Bank) works with DBE’s Haroon Mahomed on a presentation for the Scoping Lab. Photo: GKI.
Annex I: References


Annex II: Starting Challenges from Challenge Scoping Lab Organized by Work Stream

Below, find challenges developed by Scoping Lab participants and synthesized by World Bank facilitators. These challenges are categorized by stakeholder, and by the Work Stream in which they intuitively fit.

<table>
<thead>
<tr>
<th>Work stream key (newly proposed work streams are in <em>italics</em>): Note that it is not expected that all work streams will necessarily be used together.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connectivity = C</td>
</tr>
<tr>
<td>Infrastructure = I</td>
</tr>
<tr>
<td>Human Resources = HR</td>
</tr>
<tr>
<td>Digital Content = DC</td>
</tr>
<tr>
<td>E-Administration = EA</td>
</tr>
<tr>
<td>Support for Learners = SL</td>
</tr>
<tr>
<td>Resource Procurement = RP</td>
</tr>
<tr>
<td>Collaboration in Education = CE</td>
</tr>
<tr>
<td>Leadership in Education = LE</td>
</tr>
</tbody>
</table>

### Stakeholder: Learners

#### How might we design a solution that….

<table>
<thead>
<tr>
<th>Top Challenge: Allows learners to have teachers that are prepared and committed to quality teaching?</th>
<th>Work Stream</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C  I  HR  DC  EA  SL  RP  CE  LE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Top Challenge: Allows learners have a safe environment that keeps them engaged and protects them from the ills of society?</th>
<th>Work Stream</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C  I  HR  DC  EA  SL  RP  CE  LE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Top Challenge: Allows learners to access a range of subjects that cater to their future career choices?</th>
<th>Work Stream</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C  I  HR  DC  EA  SL  RP  CE  LE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Top Challenge: Allows learners to develop holistic skills that prepare them to be successful in the future?</th>
<th>Work Stream</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C  I  HR  DC  EA  SL  RP  CE  LE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Allows learners to feel like teachers care for their well-being?</th>
<th>Work Stream</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C  I  HR  DC  EA  SL  RP  CE  LE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Allows learners to have regular, predictable access to the internet (to enable research and learning)?</th>
<th>Work Stream</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C  I  HR  DC  EA  SL  RP  CE  LE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Allows learners to be inspired by real, tangible examples of people who found success through schooling?</th>
<th>Work Stream</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C  I  HR  DC  EA  SL  RP  CE  LE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Allows each individual learner enough time with learning resources (e.g. textbooks) to complete their daily after school studies?</th>
<th>Work Stream</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C  I  HR  DC  EA  SL  RP  CE  LE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Allows learners to find quality information to make informed decisions about their careers?</th>
<th>Work Stream</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C  I  HR  DC  EA  SL  RP  CE  LE</td>
</tr>
<tr>
<td>Stakeholder: Teachers</td>
<td>How might we design a solution that….</td>
</tr>
<tr>
<td>-----------------------</td>
<td>---------------------------------------</td>
</tr>
<tr>
<td><strong>Top Challenge:</strong> Allows teachers to have regular, sustained support to use ICT for teaching?</td>
<td></td>
</tr>
<tr>
<td>Work Stream</td>
<td>C</td>
</tr>
<tr>
<td>SL</td>
<td>RP</td>
</tr>
<tr>
<td><strong>Top Challenge:</strong> Allows teachers to access tools and technologies to enhance learning by learners?</td>
<td></td>
</tr>
<tr>
<td>Work Stream</td>
<td>C</td>
</tr>
<tr>
<td>SL</td>
<td>RP</td>
</tr>
<tr>
<td><strong>Top Challenge:</strong> Allows teachers to feel valued in their profession? <em>(Shared Challenge: also a Challenge for Unions)</em></td>
<td></td>
</tr>
<tr>
<td>Work Stream</td>
<td>C</td>
</tr>
<tr>
<td>SL</td>
<td>RP</td>
</tr>
<tr>
<td><strong>Top Challenge:</strong> Allows teachers to effectively and efficiently deal with their workload?</td>
<td></td>
</tr>
<tr>
<td>Work Stream</td>
<td>C</td>
</tr>
<tr>
<td>SL</td>
<td>RP</td>
</tr>
<tr>
<td>Allows teachers to feel confident in using ICTs?</td>
<td></td>
</tr>
<tr>
<td>Work Stream</td>
<td>C</td>
</tr>
<tr>
<td>SL</td>
<td>RP</td>
</tr>
<tr>
<td>Allows teachers to have regular, sustained training and support to provide holistic education?</td>
<td></td>
</tr>
<tr>
<td>Work Stream</td>
<td>C</td>
</tr>
<tr>
<td>SL</td>
<td>RP</td>
</tr>
<tr>
<td>Allows teachers to be supported in the multiple roles they must play?</td>
<td></td>
</tr>
<tr>
<td>Work Stream</td>
<td>C</td>
</tr>
<tr>
<td>SL</td>
<td>RP</td>
</tr>
<tr>
<td>Gives teachers clarity on which methods to use and how to use them to teach 21st century skills?</td>
<td></td>
</tr>
<tr>
<td>Work Stream</td>
<td>C</td>
</tr>
<tr>
<td>SL</td>
<td>RP</td>
</tr>
<tr>
<td>Allows teachers to access tools and technologies to make teaching easier?</td>
<td></td>
</tr>
<tr>
<td>Work Stream</td>
<td>C</td>
</tr>
<tr>
<td>SL</td>
<td>RP</td>
</tr>
<tr>
<td>Allows teachers access to adequate textbooks and other teaching resources?</td>
<td></td>
</tr>
<tr>
<td>Work Stream</td>
<td>C</td>
</tr>
<tr>
<td>SL</td>
<td>RP</td>
</tr>
<tr>
<td>Allows teachers to be supported by a community of peers for learning and sharing?</td>
<td></td>
</tr>
<tr>
<td>Work Stream</td>
<td>C</td>
</tr>
<tr>
<td>SL</td>
<td>RP</td>
</tr>
<tr>
<td>Stakeholder: Provinces</td>
<td>How might we design a solution that….</td>
</tr>
<tr>
<td>------------------------</td>
<td>----------------------------------------</td>
</tr>
</tbody>
</table>
| **Top Challenge:** Allows provinces to have additional, adequate, ring-fenced funding for ICT initiatives? | Work Stream  
CIHRDC  
SLRPCELE |
| **Top Challenge:** Allows for ongoing coordination between all relevant implementers (gov’t, service providers, NGOs, etc.) at provincial and national levels? | Work Stream  
CIHRDC  
SLRPCELE |
| **Top Challenge:** Allows provinces to ensure that accredited training is delivered to teachers? | Work Stream  
CIHRDC  
SLRPCELE |
| **Top Challenge:** Allows for dedicated national senior leadership to champion the vision for ICT in education? | Work Stream  
CIHRDC  
SLRPCELE |
| Allows provinces to incentivize teachers to undergo ICT training? | Work Stream  
CIHRDC  
SLRPCELE |
| Allows provinces to be fully aware of clear norms and standards on teacher training in ICTs? | Work Stream  
CIHRDC  
SLRPCELE |
| Allows schools to ensure enough of the right teachers to fill subject area needs? | Work Stream  
CIHRDC  
SLRPCELE |
| Allows for stable and ongoing senior provincial leadership dedicated to ICT in education? | Work Stream  
CIHRDC  
SLRPCELE |
| Allows provinces to buy into have a clear national vision for ICT in education, and specific roll-out plans that relate to individual provinces? | Work Stream  
CIHRDC  
SLRPCELE |
| Allows for un-fragmented implementation of long term, sustainable ICT solutions at school level? | Work Stream  
CIHRDC  
SLRPCELE |
| Allows provinces to have clear norms and standards on how to engage with service providers in implementing national plans? | Work Stream  
CIHRDC  
SLRPCELE |
| Allows all schools in every province connectivity to the internet for teaching, learning, and administration? | Work Stream  
CIHRDC  
SLRPCELE |
| Allows each school sustained access to the resources necessary for ICT support and maintenance? | Work Stream  
CIHRDC  
SLRPCELE |
## Stakeholder: Unions

### How might we design a solution that....

<table>
<thead>
<tr>
<th><strong>Top Challenge</strong></th>
<th><strong>How might we design a solution that....</strong></th>
<th><strong>Work Stream</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Allows unions to see evidence of realistic policy making through researched, evidence based design?</td>
<td></td>
<td>C I HR</td>
</tr>
<tr>
<td>Allows unions to be consulted regularly by the government on policies that impact teachers?</td>
<td></td>
<td>C I HR</td>
</tr>
<tr>
<td>Allows teachers to access regular, accredited, professional development that is customized to individual teacher needs?</td>
<td></td>
<td>C I HR</td>
</tr>
<tr>
<td>Allows teachers to gain confidence in relevant ICT skills through professional training?</td>
<td></td>
<td>C I HR</td>
</tr>
<tr>
<td>Allows unions to have trust that government procurement systems and processes are corruption-free and accountable?</td>
<td></td>
<td>C I HR</td>
</tr>
<tr>
<td>Allows both urban and rural schools to access the unique teaching and learning resources they need?</td>
<td></td>
<td>C I HR</td>
</tr>
<tr>
<td>Allows unions to trust that public education will remain free, of high quality, and without commodification?</td>
<td></td>
<td>C I HR</td>
</tr>
</tbody>
</table>

## Stakeholder: Private Sector

### How might we design a solution that....

<table>
<thead>
<tr>
<th><strong>Top Challenge</strong></th>
<th><strong>How might we design a solution that....</strong></th>
<th><strong>Work Stream</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Allows private sector to develop ICT solutions based on clearly defined education goals and needs?</td>
<td></td>
<td>C I HR</td>
</tr>
<tr>
<td>Allows the private system to engage in a transparent and corruption free tender system with clear specifications?</td>
<td></td>
<td>C I HR</td>
</tr>
<tr>
<td>Allows the private sector to focus on delivering solutions to learner needs first rather than ICT needs?</td>
<td></td>
<td>C I HR</td>
</tr>
<tr>
<td>Allows the private sector to engage with the government on long-term, profitable/sustainable ICT initiatives?</td>
<td></td>
<td>C I HR</td>
</tr>
<tr>
<td>Allows private sector to make a sustainable profit?</td>
<td></td>
<td>C I HR</td>
</tr>
<tr>
<td>Allows the private sector to avoid one off involvement in ICT projects?</td>
<td></td>
<td>C I HR</td>
</tr>
</tbody>
</table>
Annex III: Participant Analysis of the Challenge Scoping Lab

Following the Scoping Lab facilitation, participants were asked to answer a series of questions on their reflections of the Scoping Lab. These questions focus on what they learned, how effective they found the Lab, suggestions for modifications, and other, related questions. The responses are compiled below with commentary. 27 of the approximately 40 participants responded to this survey. Note that when this questionnaire was given out, the Scoping Lab was called the “pre-lab.” These two phrases mean the same thing in this context.

1. **What did you learn from the pre-lab?**

   - Methodology (listen, take notes, do not judge): 60%
   - Multi-stakeholder engagement/Tolerance to others: 20%
   - Everyone has a common goal: 10%
   - Other: 10%

   Over 60% of the participants learned new methodologies for discovering key challenges within a problem area. Participants cited how to work in multi-stakeholder groups as their second strongest learning.

2. **On a scale of 1-5, how effective was this pre-lab in clarifying challenges for the BFR lab?**

   - Very Effective: 38%
   - Effective: 52%
   - Fair: 10%
   - Ineffective: 0%
   - Very Ineffective: 0%

   All of the participants found the effectiveness of the pre-lab to be satisfactory, with over 90% of the participants finding the pre-lab to be effective or very effective. No participants considered the pre-lab as ineffective or very ineffective in clarifying challenges for the BFR lab.
3. **What was most helpful about this process?** The top four responses are shown.

![Bar chart showing the top four responses]

Approximately 70% of the participants felt that the process and multi-stakeholder engagement (which is a subset of the process) was the most helpful aspect of the Scoping Lab process.

4. **What would you change about this process?**

![Bar chart showing various suggestions]

As a suggestion for improving the pre-lab, participants pointed to a need for more context research, specifically with regards to the number of case studies, stakeholders, and data.
5. Did this pre-lab change your thinking at all?

The Scoping Lab changed the thought process of nearly half of the participants (another 41% did not answer this question). According to the participants, the pre-lab taught them to follow a more collaborative approach and a more rigorous method for working through processes.

If so, how did it change? Top five responses shown.

- Be patient, do not impose, no top-down approach
- The rigorous way to work through the process
- New approach of problem solving (look at bigger picture, then find solutions)
- Understand different views
- Be more neutral and open-minded
6. What would you like to see as an outcome from this pre-lab?

The participants presented a diverse view of what they felt should be the next step for the pre-lab. Specifically, approximately 44% of the participants recommended moving to either better defining the challenges and solutions while 24% of recommendations focused on implementation.

7. Please feel free to write any feedback. Top five responses shown.
### Annex IV: Testing Challenges by Brainstorming Solutions

Challenge Scoping Lab participants developed potential starting challenges to be used in the BFR Lab. These were then clarified and modified by the facilitation team. Before this took place, though, and to test the robustness of the challenges, participants generated ideas for potential solutions. They did this by first grouping their challenges into themes (e.g. challenges around learner needs for a supportive school environment, etc.). They then brainstormed potential solutions, and then storyboarded these solutions. In the storyboarding exercise, working groups developed a panel on the challenge, a panel on the potential solution or bundle of solutions, and a panel on the potential impact of these solutions. They presented these panels to other working groups for feedback and additional inspiration. See below for an example challenge from one group, an example solution from another group, and an impact panel from a third group.

<table>
<thead>
<tr>
<th>The Challenge</th>
<th>Potential Solutions</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong> Schools lack proper infrastructure, teachers face a lack of training and status, and classes do not have adequate resources. Thus, learners are not able to learn basic skills. This makes the curriculum inaccessible to learners. The outcome: academic exclusion.</td>
<td><strong>Description:</strong> Learners with handicaps and learning disabilities face challenges surpassing other learners in South Africa. In the solution proposed in this example, ICTs and other supportive infrastructure provide alternate means of gaining skills for learners with special needs.</td>
<td><strong>Description:</strong> For learners with special needs, the assistance they receive from innovative ICT-based solutions, social services, ICT-solutions in their own homes, and a supportive school environment provide them with the skills they need to successfully complete school, and find meaningful employment.</td>
</tr>
</tbody>
</table>