Thematic Review

Teaching, Learning and Assessment

March 2018

GEC Thematic Reviews

This paper is one of a series of thematic reviews produced by the Fund Manager of the Girls' Education Challenge, an alliance led by PwC, working with organisations including FHI 360, Nathan Associates and Social Development Direct.

The full series of papers is listed below:

- Understanding and Addressing Educational Marginalisation
      Part 1: A new conceptual framework for educational marginalisation
- Understanding and Addressing Educational Marginalisation
      Part 2: Educational marginalisation in the GEC
- Economic Empowerment Interventions
- Community based Awareness, Attitudes and Behaviour
- Addressing School Violence
- Girls' Self-Esteem
- Extra and Co-Curricular Interventions
- Educational Technology
- Teaching, Learning and Assessment
- School Governance

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Executive summary

Teaching and learning (T&L) processes and approaches are at the core of the Girls' Education Challenge (GEC), reflected at the centre of its theory of change, and inevitably having a significant influence on project outcomes. Once marginalised girls have overcome the barriers they face in getting to school, their quality of learning depends largely on their teachers and on the classroom environment they experience. The nature and use of assessment is an important part of T&L and projects' attention to it has increased steadily through the programme.

The quality of education has been a growing focus for governments and donors alike, as data has emerged revealing the low levels of foundational skills being reached even when children have completed a cycle of primary education. In the current literature there is an acknowledged gap in knowledge about which specific teaching and assessment strategies and classroom practices lead to improved learning outcomes. Nevertheless, there is consensus on the need for a strong focus on teaching and learning processes.

Almost all projects within the GEC portfolio worked with teachers in some way or other, having identified factors such as teachers' lack of basic pedagogical skills, poor lesson planning and ineffective assessment techniques as key challenges in many cases. These issues were attributed either to poor initial training or to limited professional development and support. Projects have implemented a wide range of interventions, training and activities related to classroom approaches, content of resources, language of instruction, assessment techniques, and specific pedagogies.

Analysis of results clearly showed an association between projects which delivered the greatest gains in girls' learning and those which included a strong and direct focus on the quality of T&L and assessment, often combined with the delivery of extracurricular academic activities and the use of mentors and role models.

Lessons learned through a consideration of this theme are wide ranging, encompassing discussion of types of teacher engagement, the role of teachers and students in accelerating learning, the importance of language, and the potential for sustainability.

This paper concludes with a number of considerations to be taken forward into the next phase of the GEC and for sharing with other practitioners, policy makers and funders, as follows:

1. Projects would benefit from placing a stronger focus and effort on the initial and continuing diagnosis of student learning needs and then designing teacher training accordingly, incorporating the use of assessment.
2. The mode of training and supporting teachers should be carefully considered and should include well-designed follow up, practical sessions and fostering of peer to peer support.
3. Selection of teaching and learning resources, including the development of new resources, must take language of instruction into account in order to maximise the use and reach of resources as tangible and sustainable contributions to improved learning.
4. To ensure that investment in teacher training and support is delivering value for money, monitoring should include observation of changes in teacher behaviour and specific aspects of the quality of education in order to assess the effectiveness of interventions.

1. Introduction

This paper describes the range of teaching and learning approaches employed by projects in the first phase of the Girls' Education Challenge (GEC) for the education of marginalised girls. It seeks to explore questions about the design and delivery of T&L approaches; the kinds of changes the interventions are bringing about; the ways in which these are being measured; and how sustainable and scalable the changes are in GEC contexts. The majority of GEC projects sought to influence teaching and learning processes in some way, and this paper uses examples from a wide selection of the 37 projects, ranging from large whole school approaches to small tailored interventions. These examples illustrate the key findings and lessons emerging from the GEC regarding changes to pedagogy and classroom dynamics which seem to be having a positive effect on girls' learning, as well as modes of teacher training delivery and how well they are working. These are presented in the context of current and recent literature on teaching and learning approaches in GEC type environments. The paper explores the sustainability of the various approaches and concludes with a set of considerations for practitioners and policy makers.

Teaching and learning processes and approaches are at the core of the GEC, reflected at the centre of its theory of change, and inevitably having a significant influence on project outcomes. Once marginalised girls have overcome the barriers they face in getting to school, their quality of learning depends largely on their teachers and on the classroom environment they experience. The nature and use of assessment is an important part of T&L, and projects' attention to this aspect has increased steadily through the programme. The combined quality of teaching, learning and assessment affects the likelihood of girls' continuing to attend school as they and their families balance the gains of education with the costs (financial and other) of them attending school. With this in mind, 'teaching, learning and assessment' is a key intervention theme around which stakeholders in international education can learn.

The GEC presents an opportunity to examine a range of interventions in different contexts, to assess what is working well, and to ask how our understanding of this could influence change in the various policy and institutional settings in which projects operate. The multi-faceted nature of GEC projects, and the specific evaluation focus on literacy, numeracy and attendance outcomes, rather than qualitative evaluation of change, means that there are limitations to the links and attribution which can be established between specific interventions and the projects' outcomes. However, common factors associated with success have been identified, and a broad set of lessons around project design have emerged.

Within this theme, we aim to build on existing research about pedagogical approaches, including subject specific pedagogy, being promoted in classrooms and other learning spaces, and to explore the links between particular pedagogical practices (such as gender responsive pedagogy and inclusive education) and girls' learning outcomes. With the increasing promotion of participatory teaching and learning strategies in teacher training colleges and in schools, it is important that the rationale for this is supported by evidence. Of the 37 projects in the first phase of the GEC, 30 have implemented teacher training activities and although the nature and length of the training varies across projects, the literacy and numeracy testing of project cohort girls as well as control groups provides an unprecedented opportunity for an analysis of the difference made by the introduction of particular methods and approaches.

As such, this paper draws together the evidence and a wide range of lessons learned from the past three years of project delivery, drawing on endline research as well as earlier baseline, midline and annual reviews. An earlier T&L paper (March 2016) focussed more specifically on teacher training, whereas a broader approach is taken in this version to incorporate a consideration of the two way processes and dialogue between teacher and learner. This paper also includes a specific focus on numeracy, identified at midline as the weaker of the two key GEC learning outcomes.

For further information on teaching and learning using technology and on teaching and learning as part of extra or co-curricular activities, please see the respective GEC thematic papers on these topics. There is also overlap between this paper and that on school governance.

If they are to be successful, and sustainable, efforts to improve T&L must be located in a broader policy and systemic setting. Projects were assessed at design stage to ensure that their work with teachers was integrated with the state provision of and for teachers. As we look at emerging lessons, this link remains essential – changes observed and gains made at school level need to have the potential to contribute to more sustainable change within those schools, and across the system more broadly.

It is important to note that many of the GEC projects mentioned in this paper will continue to the next phase of the GEC, and as such can build on current achievements and adjust to address some of the challenges they have faced. The lessons set out here will contribute to this continued GEC work as well as to DFID's broader work in education, and provide insights for other practitioners and policy makers.

2. Overview of teaching and learning discourse

The quality of education has been a growing focus over recent decades, as data has emerged about the low levels of foundational skills often being reached, even when children complete a cycle of primary education. Since the widespread uptake of Universal Primary Education, which began in the 1990s, there has been a conscious shift from focusing on enrolment to focusing on sustained attendance, quality of education and learning. Key international bodies (see, for example, UNESCO's (2015) Education For All Global Monitoring Report) have pointed to the importance of appropriate pedagogies and high quality education delivery in order for children, particularly those in marginalised contexts and non-literate environments, to achieve their learning potential. This leads to a strong focus on teaching and learning. For example, Unterhalter et al. (2014) conclude that "the strongest evidence of what works is associated with improved training of teachers, both to higher levels of subject area expertise and professionalisation, and with specific attention to the needs of girls and gender equality, and the fostering of collaborative learning styles."

In the current literature there is a clearly acknowledged gap in knowledge about which specific teaching and assessment strategies, and which classroom practices lead to improved learning outcomes. Literature reviews have found consistency in the types of strategies and practices being promoted and supported, but a dearth of information about whether they lead to improved learning outcomes. DFID's rigorous literature review on 'Pedagogy, Curriculum,

Teaching Practices and Teacher Education in Developing Countries' (Westbrook et al., 2014) asked which pedagogic practices, in which contexts and under what conditions, most effectively support all students to learn at primary and secondary levels in developing countries. A total of 54 empirical studies, covering a range of contexts, were examined and some strong consistencies found in terms of strategies and practices which increase and enhance classroom participation and the teacher-learner dialogue (see below), but for the most part these had not been analysed in relation to student learning outcomes.

Prominent teacher strategies which lead to effective communication:

- Sustained attention to learners and to inclusion
- Creation of a safe environment in which learners are supported
- Reference to learners' background and experiences

Six key effective teaching practices:

1. Flexible use of whole class, groups and pair work
2. Frequent and relevant use of learning materials beyond textbook
3. Open and closed questioning, encouraging learners to question also
4. Use of feedback
5. Demonstration and explanation, drawing on sound content knowledge
6. Use of local language and code switching; planning and varying lesson sequences

Source: Westbrook et al. (2014)

It should be noted that, unlike the GEC, few of the studies featured in the review used baseline and post-learning tests to measure impact. Instead, measures such as greater student engagement and confidence were used as general indicators. The study identifies a number of gaps, indicating that further research is needed to inform the application of the effective strategies in remote rural schools; with large classes; with over-age pupils; with learners with disabilities; and with learners from particular cultural, social and economic backgrounds. All of these additional factors are relevant to GEC project contexts (see the paper on Education Marginalisation for a detailed description).

Alexander (2014) urges closer attention to the "classroom processes that for children and young people are truly transformative" in the post-2015 agenda, and it is this focus which is perhaps at the heart of the quest for quality in education. While many teachers may seek to use a prescribed set of practices, the key to their effectiveness in terms of learning is the creative and communicative use of them, i.e. how they are mediated (Moon and Wolfenden, 2012). This requires paying attention to how students respond; how learners' perspectives and experiences of school and classroom life change; and placing students centrally in the teaching-learning process. There is not space here to examine all of Alexander's (2014) concerns around process, but of particular interest to the GEC is his proposal that "learning needs a process indicator as well as an outcome one", and his suggestion that the quality of teaching and learning might be appropriately assessed through measures of student engagement and of teacher-student reciprocity. Some GEC projects have tracked changes in teacher behaviour which allow us to explore this proposition, relate it to student learning outcomes, and refer to it in our recommendations for future programmes.

Schweisfurth's (2011) review of research on child-centred learning is also an important reference point, given the number of GEC projects which have focussed on this overarching approach. Schweisfurth questions the sustainability of a shift to more child-centred learning in many developing countries, where education systems do not have the capacity to provide the requisite pedagogic support to teachers. This highlights the importance of continuing support to teachers following initial training and other interventions which we will explore further in the section of this paper on lessons learnt.

Linked to this is an emerging discourse reflected in the literature which suggests that teacher training and continuing professional development (CPD) should be viewed holistically, looking at teachers' thinking, content knowledge and attitudes. Well-designed 'teacher support' programmes that combine training and instructional materials, improved pedagogies, and equipping teachers with inexpensive instructional tools are found to have the greatest impact (DFID, 2014). This resonates with the multi-pronged approach being taken by a number of GEC projects.

To add a further dimension, Hattie's (2009) synthesis of 800 meta-analyses emphasises that it is not just the education of teachers, but the broader policy context in a country around teacher recruitment, deployment, management that has an impact. Projects working with teachers need to be mindful of these contextual issues and challenges so that their interventions are compatible with the framework teachers are working in. DFID has explored this more deeply in its Engaging with Evidence Working Paper (DFID, 2014) and found broad consensus on the need to attract, retain, develop and motivate teachers. A number of studies (Unterhalter, 2014; Sperling et al., 2015) look at gender in particular and it is noteworthy that although they show that deliberate measures to support girls' education, such as the employment of women as teachers, "appears promising" it is difficult to isolate the effects of this conclusively, and the studies examined show that it is teachers' knowledge, attitudes and level of support, rather than gender, that is crucial.

A further area for consideration is the use of classroom resources, and teachers' involvement in developing them. DFID's (2014) 'Engaging with Evidence' paper looked at the circumstances under which textbooks improve learning and found that as well as design factors, the way textbooks are used by teachers and students is key: "patterns emerg[ed] around pedagogy, language and textbook ownership". See GEC Thematic Paper: Educational Technology for the role of teachers in the use of technology-based resources.

3. Teaching, Learning and Assessment Interventions in the GEC

Overview of teaching, learning and assessment inputs in the GEC

Of the 37 projects in the first phase of the GEC, 30 worked with teachers directly: 16 out of 19 Innovation Window projects; 11 out of 14 Step Change Window projects; and 3 out of 4 Strategic Partnerships projects. Over 90% of GEC target beneficiary girls were reached through these projects. Most of the activity with teachers took place within the formal system, but there was also significant work with community teachers and in non-formal settings.

Teaching, learning and assessment interventions were the most directly linked to the common GEC outcomes of literacy and numeracy. As such they featured prominently in project theories

of change as a clear and crucial bridge between the identified barriers to education and the goal of accelerated learning for girls. The theory was that if the quality of teaching and learning and the use of formative assessment improved, then a typical beneficiary girl's learning outcomes would also improve, she would be more likely to stay in school, and her teachers would deliver higher quality teaching to other children, thus contributing to retention and sustainability as well as learning. There were of course assumptions behind this theory and many influencing factors which might disrupt the intended results chain.
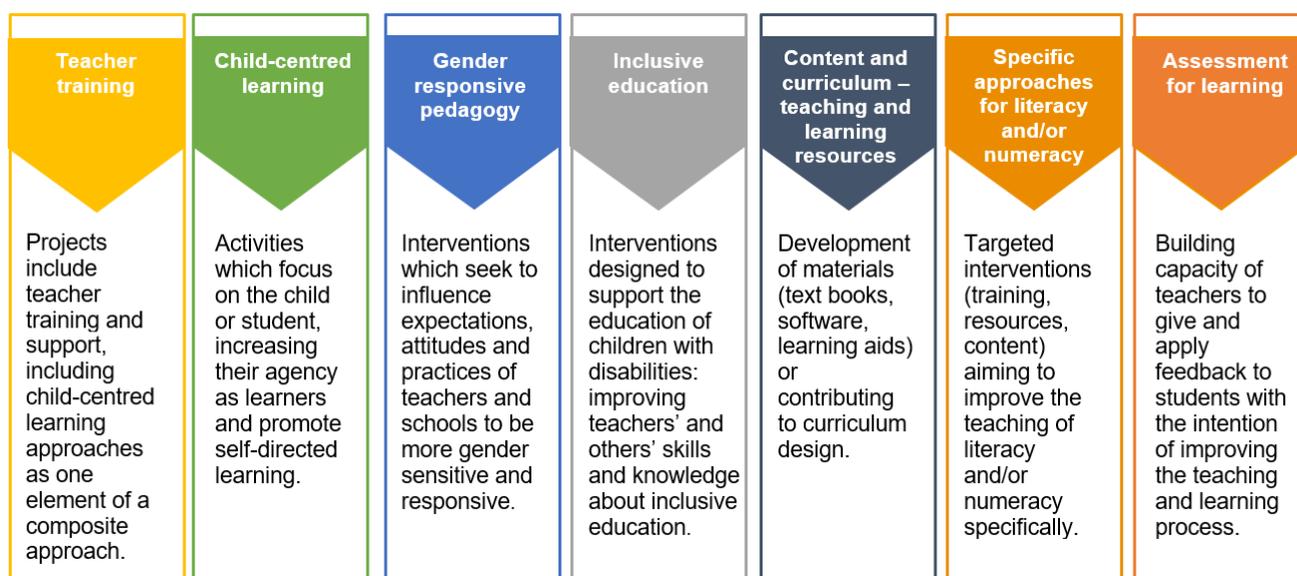
In their baseline analysis of barriers to girls' learning, many projects identified teachers' lack of basic pedagogical skills, and ineffective lesson preparation and delivery as key challenges. These were attributed either to poor initial training or to limited professional development and support (Coffey, 2015). Poor quality teaching was also presented as a reason for the irregular attendance of both girls and boys, or to their dropping out altogether from school – if children are not learning in school there is limited incentive to attend. Many projects (for example, those implemented by Camfed, International Rescue Committee (IRC), Eco Fuels Africa and Varkey Foundation) aimed to provide teacher training and support to promote child centred, active teaching and learning approaches. In some cases this entailed an explicit focus on subject specific pedagogy including how to improve the teaching of reading, as in Save the Children's use of the Literacy Boost model in Mozambique, or numeracy, such as I Choose Life's strategy of pairing girls who found mathematics hard with girls who enjoyed it.

A number of projects also identified an additional barrier to be the lack of awareness among teachers of girls' specific learning needs borne out of weak assessment practices, and of classroom practices that discriminate against girls. In response, projects included teacher training in gender responsive pedagogy in their approaches. Examples of this include those implemented by I Choose Life, Aga Khan Foundation, CfBT, Child Hope and Promoting Equality in African Schools (PEAS). Training, reinforced with in-class support and mentoring to influence teachers' practice, led to changes in the classroom aimed at building confidence amongst both teachers and students.

Projects recognise that teacher training and support is fundamentally a responsibility of the state. As such, a number of projects worked alongside the relevant Ministry of Education to enhance existing teacher support interventions (e.g. Care Somalia, I Choose Life, VSO Nepal, Raising Voices, CSU, ChildFund, CfBT and Save Mozambique). Collaboration was achieved in various ways, for example through the involvement of government trainers in teacher training activity or in assessing teachers.

Overall, GEC interventions involving teaching, learning and assessment can be grouped into seven areas, as shown in Figure 1 below. It should be noted that all projects which included teacher training generally did so as one element of a composite approach. Projects drew on a wide range of inputs to education provision; mostly at school level and involving two or more inputs in combination. This is important to note in the endline analysis as, although similar combinations of interventions can be compared, the nature of the evaluation makes it difficult to isolate the effect of discrete teacher training activities. A mapping of individual project interventions is included in Annex 1.

Figure 1: Teaching, learning and assessment inputs in GEC projects

Teacher training	Child-centred learning	Gender responsive pedagogy	Inclusive education	Content and curriculum – teaching and learning resources	Specific approaches for literacy and/or numeracy	Assessment for learning
Projects include teacher training and support, including child-centred learning approaches as one element of a composite approach.	Activities which focus on the child or student, increasing their agency as learners and promote self-directed learning.	Interventions which seek to influence expectations, attitudes and practices of teachers and schools to be more gender sensitive and responsive.	Interventions designed to support the education of children with disabilities: improving teachers' and others' skills and knowledge about inclusive education.	Development of materials (text books, software, learning aids) or contributing to curriculum design.	Targeted interventions (training, resources, content) aiming to improve the teaching of literacy and/or numeracy specifically.	Building capacity of teachers to give and apply feedback to students with the intention of improving the teaching and learning process.

Teacher training: Implementation approaches varied, with some projects using a cascade approach (either full or partial) and focussing on training the trainers, whilst others adopted a whole school approach to training. A smaller group linked with existing government training, bringing new approaches and content. The length of training courses also varied greatly, from short 3 day intensive courses, to training spread over the course of 2 years. We need to be mindful of this as we draw comparisons across projects. Many projects distinguished between the gender and previous training of project teachers, and whether teachers were working in regular classes or in remedial/catch-up situations.

Child-centred/active learning: Projects aimed to shift the focus from the teacher to the learner and from "chalk and talk" methodologies to more active, two-way dialogue between teachers and learners. The aim was for students to become more active in their learning. This usually involved the promotion of particular classroom practices such as group work, inquiry based activities and independent learning. Engagement of headteachers was key so that teachers could adopt new methodologies confidently.

Gender responsive pedagogy (GRP)[1]: In general the term 'gender responsive pedagogy (GRP)' refers to interventions which influence expectations, attitudes and practices of teachers and schools when teaching girls and boys. Consideration is usually given to the following elements, amongst others: how gender is reflected in text books and other resources (including teaching children about gender); use of language to boys/girls; type of questions posed to girls/boys; attention time given to boys/girls; discussions of boys'/girls' progress and aspirations; acknowledgement of risks and vulnerabilities girls face; classroom seating arrangements; classroom dynamics (ensuring mutual respect); and classroom culture e.g. chores that boys and girls do. A range of materials and manuals are available and were used by projects, for example, the comprehensive manual produced by the Forum for African Women Educationists (FAWE) as well as those produced by national governments. GEC projects tended to include GRP as a focus – sometimes the key focus – in teacher training.

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[1] For more analysis on the effectiveness of GRP see the GEC Evaluation Manager Endline Reports

Inclusive education (IE): A small number of projects sought to implement and promote IE approaches, and two projects (Leonard Cheshire in Kenya and Cheshire Services in Uganda) targeted their interventions specifically for girls with disabilities. A first necessary step was the need to address a lack of awareness and understanding about the inclusion of children with disabilities in mainstream education before moving to more specific teacher training. Whilst many governments have introduced inclusive education policies, relatively few have had the capacity to allocate appropriate resources. Aware of this, projects have presented their approach via 'model schools' in order to demonstrate to ministries how existing schools can become inclusive in their approaches to access, teaching and learning.

Content and curriculum – teaching and learning resources: Some projects included the development and distribution of materials in their activities, usually addressing a perceived gap or seeking to improve the quality of learning resources available. Two projects did this through online content; one through the making of educational television programmes; and several through the development of specific courses or curricula to supplement the school curriculum, accompanied by resources developed as part of the project. In project contexts where a significant challenge relating to language of instruction was identified, projects produced local language resources to assist the teaching and learning process.

Assessment for Learning: Different to assessment of learning, where progress is measured at specific points, assessment for learning (or formative assessment) is promoted as an integral part of the day-to-day teaching and learning process. It is presented as a valuable strategy for providing ongoing feedback that can be used by teachers/instructors to improve their teaching, and by students to improve their learning. It involves a range of activities such as planned questioning around important points to gauge understanding, and shared feedback from the teacher to students on what they have achieved and where improvement is necessary. A number of projects reported the use of these techniques. One project introduced intuitive software which assessed a child's strengths and weaknesses as they completed tasks and focused future tasks on areas of weaknesses. Class teachers could then use this information to adjust the content and emphasis of the lesson.

Specific approaches for teaching literacy and/or numeracy: Although literacy and numeracy skills are an integral and implicit component of all school curricula, some projects included a specific focus on accelerating the acquisition of literacy and numeracy skills, particularly those working with out-of-school girls (See case study below)

> **I Choose Life, Kenya: a case study on numeracy focussed teaching and learning**
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> "My name is Susan. I am a Class 8 learner. I am an orphan and I face many difficulties. In addition to my family situation which made concentrating in learning hard, other difficulties at school added to my lack of concentration in learning especially mathematics. For example, teachers were too fast in teaching and it was hard for me to follow what they were explaining. I knew that mathematics was hard and I also got no encouragement because most of the girls did not like mathematics and did poorly in the subject. I had very limited time to do extra school work after school hours because of my family responsibilities at home."
>
> Susan is typical of the beneficiaries targeted by the Jielimishe project implemented by I Choose Life in Kenya. The range of activities implemented to support numeracy learning by the project included:
>
> - The introduction of new teaching activities, which made learning mathematics fun and presented it as achievable
> - Mentorship and exchange visits organise by teachers, which enabled girls/students to meet other girls/learners who liked mathematics.
>
> After training, teachers reportedly became more friendly and approachable to the learners. Learners were able to ask teachers questions without fear and learners could access teachers when they needed to discuss their work. In addition, teachers were interested to talk to learners about other problems at home that could be affecting their school work. Furthermore, pupils slowly started developing interest in learning mathematics and exploring mathematic concepts with their peers during club time.

Holistic Approaches

As noted in other papers in this series, all GEC projects have implemented a multi-disciplinary set of activities to improve girls' attendance and learning, often with more than five different activity strands. It should be noted, therefore, that none of the teaching and learning inputs described above have been used, or indeed evaluated, in isolation. They should be understood as prominent features of contextualised and bespoke project designs. A number of projects have gone further and presented their overall approach as intentionally 'holistic', designed to simultaneously address a range of related barriers which combine to impede girls' access to and progress in education. In these projects, the inputs and outputs are inter-dependent, arguably raising the level of risk in that if one component is unsuccessful, that might jeopardise the whole project. Two example of holistic approaches which included a strong teaching, learning and assessment focus are the STAGES consortium in Afghanistan and the approach of Camfed International, implemented in Zambia.

How GEC projects measured change in teaching and learning approaches

Projects adopted a range of approaches to measuring change relating to teaching and learning, some referring to specific practices (e.g. interactions between girl and teacher, and specific methodology of teaching literacy/numeracy) while others looked more generically for improved use of taught pedagogy. Examples of indicators of success included:

- Teachers trained and observed to be instigating new teaching practices (e.g. participatory methods) and using new skills acquired;
- Number of classrooms and teachers facilitating peer to peer teacher mentors;
- Teachers who are applying inclusive education practices to teach girls with disabilities.

In general the indicators articulated in project logframes enabled the tracking of progress principally in terms of delivery of activities and outputs, rather than measuring qualitative change. In the next phase of GEC, an additional level has being added to project logframes to allow for tracking and analysis of intermediate outcomes such as improved quality of teaching. This should improve understanding about the nature of impactful interventions and how they have led to the project outcomes. Indicators will need to be detailed enough for them to generate the sort of evidence which is currently lacking, about which specific teaching, learning and assessment inputs lead to improved outcomes for marginalised girls. Hand in hand with this is the need for well-designed quantitative and qualitative tools which can be used to measure changes in, for example, classroom practices or the richness of teacher-pupil dialogue.

Projects were strongly advised from the start of the GEC to use observation tools to measure changes in teacher behaviour and classroom dynamics. These tools were used by some projects for giving feedback to teachers and headteachers; as part of the training cycle; for monitoring the broader effect of training; and for diagnostic purpose, to identify the training needs of teachers and where follow up support was needed. Observations were conducted by a wide range of staff across projects (project field staff, headteachers, teacher trainers, district officials etc.). Spot checks by monitors of those doing observations helped quality assure the process. Some class observation tools were developed by projects themselves, others used established government tools, adapted to the needs of the project. Some tools were designed specifically to gain feedback from pupils, and teacher self-reflection tools have been used to promote CPD amongst teachers.

Projects noted a number of challenges in the use of observation tools, including timing and length of observation; engagement from headteachers; and the reliability of tools, particularly self-reflection and pupil perspective tools. In the second phase of GEC, projects will be supported with further guidance on the selection and adaptation of these types of tools, and in their responses to the data they gather from them.

Links with other interventions

There are a number of important links between teaching, learning and assessment interventions, and those aspects covered in detail in other thematic papers. In brief:

- **Extra-curricular and co-curricular interventions**: There is evidence of an important role played by extra-curricular learning opportunities in facilitating girls' educational progress, particularly for those who have missed out on formal schooling. Activities often include tailored, even individual, support for girls based on their actual rather than assumed learning levels.

- **Technology for Education:** Technology, when used effectively, acts as an enabler of teaching and learning and is an integral part of some teaching and learning interventions,

both in terms of content and of delivery. It is also used as a means of ongoing teacher support and peer support, both student to student and teacher to teacher.

- **School Management and Governance**: When changes to teaching, learning and assessment processes are introduced, it is vital to engage those charged with leading and managing the school or learning spaces, otherwise the anticipated positive effects of the changes can be diminished or blocked. It is also important to build capacity of those managers at the same time as building teachers' skills so that overall quality improves with a strong foundation.

- **Working with Marginalised Girls:** On the whole, GEC teaching and learning interventions targeted marginalised girls, but the nature and degree of marginalisation varied hugely. The marginalisation factors experienced by girls influence how well particular pedagogical and classroom approaches will work, for example whether they are sensitive to the local culture and context. Most teacher training in the first phase of the GEC included a focus on gender sensitive pedagogy. Again, when designed well, this can improve the quality of education. However, if the messaging is unclear, or if teachers have weak subject specific pedagogy, it can have detrimental effects on gender relations and gender equity.

- **Teacher Supply:** A number of projects are also contributing to long term solutions for teacher capacity at the same time as providing career pathways for older girls, through initiatives which prepare girls for teacher training and provide foundation courses.

Project adaptations since midline

In response to their midline evaluation findings, projects were encouraged to adapt their approaches and interventions to accentuate teaching and learning processes which appeared to be leading to better learning outcomes, and add new activities to trigger further change in order to maximise their results at endline.

The most common adaptation after midline was to increase the amount of teacher training dedicated to specific literacy and numeracy methodology. Projects where the language of instruction was identified as an issue at midline also began to intervene to mitigate this barrier, and some increased the girl-only spaces and opportunities for learning. The following projects expanded the interventions they perceived to be most influential on learning:

- Education Development Trust in Kenya broadened its coaching programme to incorporate school leadership and adapted its after-school tuition methodology for use within regular classrooms as well as in extracurricular activities

- Health Poverty Action in Rwanda, who saw limited literacy and numeracy results at midline, introduced a peer mentorship model, with stronger students helping weaker ones

- Care Somalia explored and introduced a numeracy booster intervention to improve results following stronger literacy than numeracy results

- Varkey Foundation in Ghana, to further improve literacy results at end line, catered separately to students at basic and intermediate levels[2], and improved the alignment of the lessons with the national curriculum to ensure smooth transition

A common observation in the midline evaluation reports was around the rates of teacher turnover and 'churn' in the teacher cohorts trained by projects, which compounds the already high levels of teacher absenteeism. A common observation was that there was a risk of the investment and benefits of teacher training carried out by projects were being diluted. After midline, projects took steps to overcome this by:

- Planning for a certain level of attrition and training more teachers than needed;
- Training a group instead of only one teacher in each school;
- Working closely with Ministries on retention of trained teachers.

How Varkey's MGCubed project in Ghana adapted after midline

To improve literacy results, teaching and learning processes were modified in the following ways:

- Changing the objectives of literacy teaching to be more developmentally appropriate and progressive;
- Changing literacy curriculum and introducing:
    - Phonics (previously literacy was taught using names not sounds of letters);
    - A whole language approach to teaching reading
- Having a specific focus on oral comprehension, story reading comprehension, grammar and vocabulary;
- More interactive, activity based problem solving classroom activities;
- Addressing teachers' lesson planning around different and varied approaches (visual, oral, kinaesthetic learning).

To enhance sustainability, a number of projects also adapted their approach to work with ministries of education, for example, to carry out joint classroom observations. This enabled them to have conversations about areas for enhanced teacher support, which governments could then follow up through in-service teacher training programmes. See also the GEC 'Sharing Lessons' Newsletter on Sustainability (unpublished – available from the GEC Fund Manager).

To improve community ownership, some projects accentuated their efforts towards gaining buy-in and cooperation from parents in order to reinforce changes taking place in their daughters' schools. However, some changes within the classroom which appeared to be working well during the project (such as use of role models and peer mentoring) will be harder to sustain beyond the project setting if they are not aligned with the regular approach and practices of the school or learning centre. Crucially, to embed change within individual teachers' approaches and practice, some projects (for example, WUSC in Kenya) introduced more teacher self-reflection and peer-to-peer reflection, combined with support to school leaders to facilitate continuing changes in practice.

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[2] Linked to the 'Teach at Right Level' strategy used, for example, by JPAL in India.

After endline, as the majority of projects from the first phase of the GEC continue as part of the GEC-Transition programme, further and more significant adaptations are being made to ensure that investments in teaching and learning are well targeted and implemented for maximum impact.

4. Key findings

GEC projects were mandated to achieve improved school attendance and crucially, improved learning outcomes, measured in terms of literacy and numeracy. This section will set out the results at endline from projects with a core focus on teaching and learning processes, and/or assessment for learning, highlighting approaches that worked to improve literacy and numeracy outcomes.

The GEC approach to evaluation

The GEC has involved a rigorous approach to the evaluation of projects' effectiveness in improving both attendance and learning outcomes. This has included guidance and requirements focused on ensuring 'internally valid' evaluations i.e. that can robustly say whether the intervention worked or not when compared to control groups. The approach was applied to all projects, with the exception of projects in high risk and fragile contexts in Afghanistan, Somalia and the refugee camps of eastern and northern Kenya, where comparison groups were not deemed appropriate.

The GEC approach to evaluation has brought together a number of elements:

- Independent, external evaluators as the means to measure and verify outcomes;
- A longitudinal cohort approach (following the same girls over time);
- Household surveys (HHS) conducted for this cohort;
- Assessments of literacy and numeracy and a clear model for setting learning outcome targets;
- Use of experimental methodologies involving comparison group.

All projects were required to measure learning in terms of literacy and numeracy (measured through a recognised assessment instrument relevant to context), and attendance (using school registers and independent spot checks). A range of learning assessment tools were used (EGRA/EGMA, ASER, Uwezo national assessments, and bespoke tests developed by projects and their evaluators).

The range of interventions within the GEC portfolio illustrates a recognition that there are a number of variables which can influence learning outcomes, including teacher behaviour and attitudes; learner behaviour and attitudes; teaching methodologies; wider school strategies; and resources. As such, projects' theories of change targeted factors at the community, school and individual levels. Additionally for this theme, many projects distinguished between the gender and previous training of project teachers, and whether teachers were working in regular classes or in remedial/catch up situations.

Evaluation reports showed mixed results across the portfolio, and in some cases inconclusive results (see the GEC Evaluation Manager's (Coffey, 2017) endline reports for a detailed account). It is important to note that the endline project evaluations tell us whether a project as a whole achieved the measured outcomes, though we cannot isolate the contributions of specific interventions.

Common features of successful teaching and learning interventions

An analysis of the endline results of a sample of GEC projects showed that projects which showed high impact on learning, and better than expected progress in numeracy had the following features:

- They aimed to strengthen teaching and learning in specific ways
- The interventions were designed to have a strong knock-on effect across the school
- additional support was provided to girls, such as learning mentors and girls' only groups, which included academic support
- Teachers reported their own gains from the interventions such as feeling more valued and more confident to try out new ideas in the classroom
- Interventions addressed fear and negative attitudes (of both teachers and students, particularly girls) towards mathematics and numeracy

Focused teacher training for a critical mass of teachers was important for improving learning outcomes

The GEC baseline survey in 2012, in line with other literature at the time, helped to highlight the incorrect assumption held by many that if girls were simply in school more, they would be guaranteed to learn. Despite the upturn in enrolment and attendance levels in many GEC contexts over the previous decade, there was clear evidence of worryingly low levels of literacy and numeracy across the portfolio and a great deal of concern regarding the quality of teaching.

At midline, progress was being made but it had become obvious that significant increases in learning outcomes in literacy and numeracy were only likely to occur by introducing purposeful and specific literacy and numeracy teaching interventions.

At endline the highest scoring projects all included some level of training for the teachers involved. The most successful went beyond general pedagogical advice, and took into consideration factors such as teachers' gender, their previous training, and whether they were working in regular classes or in remedial/catch up situations. A further common factor of successful projects was achieving change through challenging teachers' own attitudes and preconceptions about what constitutes effective teaching

The implementation of focused teacher training within these projects saw common tangible changes in teacher practice as listed below.

- Increased focus of teachers on the learner, including interest in the child beyond the classroom;
- Increased pupil teacher dialogue and equality of interaction, with both boys and girls, and with girls with disabilities;
- Teachers rethinking the classroom set up;

- Success in steering classroom discipline away from corporal punishment to alternative methods, so that girls are not scared to participate (see also the paper in this series on 'Addressing School Violence');
- Increased teachers' subject knowledge, and pedagogy which supports literacy and numeracy acquisition;
- More teachers using lesson planning, and applying an understanding of scope and sequencing of topics;
- Introduction of formative assessment techniques;
- Promotion of teacher peer support and reflective practice;
- More consistent grading.

Certain combinations of interventions worked better than others to improve learning outcomes

As we saw in the description of interventions, GEC projects were characterised by multi-faceted project designs and this presents an interesting lens through which to view project outcomes and results. It allows us to see whether there are particular combinations of activities, approaches and partnerships which led to the most marked results.

Close analysis is still ongoing but trends emerging at endline suggest firstly that teacher training and support, when combined with extra-curricular activities seems to have had a stronger influence on average learning achievements than other combinations of interventions (see the GEC Evaluation Manager Endline Reports for closer analysis of this aspect, (Coffey, 2017)). A second pattern identified is that those projects combining economic interventions with infrastructure and resource-related interventions seem to have had particularly high literacy outcomes.

Avanti Communications, one of only a few projects which attempted to determine the effect of different components of its overall intervention, found that the full package of activities they delivered had a greater effect than the various combinations that they tested that excluded some elements, for example, personal tutoring or stipends. Further, the evaluation was able to show that tutoring appeared to improve literacy for high achieving girls and improve numeracy for low achieving girls.

The use of educational technology often had unexpected impacts on teaching and learning

The impact of new technology was sometimes unexpected and pointed back to conventional questions of teaching and learning. For example, the Varkey MGCubed project found that being taught by a 'video teacher' had a surprising impact on how the girls felt about their mathematics. As described by the project officer:

"Knowing that the video teachers cannot cane them, students are able to more freely express themselves when they do not understand a concept. Also, the students know that the video teacher will help them, rather than caning them, when they get an answer wrong."

The use of formative assessment contributed to improved learning outcomes

Learning outcomes for projects which adopted a clear focus on formative assessment were generally positive. Three projects in particular demonstrate good practice in using assessment for learning (see box below). All three of these projects saw positive shifts in learning outcomes, attributable at least in part to these formative assessment strategies.

> **Good practice in using assessment for learning**
>
> Camfed applied informal teacher-led formative assessments for all subjects in upper primary, using assessment principles drawn from the child-centred methodology, primarily aimed at increasing student confidence. This included informal assessment through targeted questioning before, during and after lessons and teacher-facilitated feedback on group activities. Qualitative data at endline suggests these approaches increased student confidence in learning and engaging in class. The project's learning outcomes back this up.
>
> The ENGINE project in Nigeria, which used individual feedback techniques to support girls in school to learn at their own pace, saw positive effects on numeracy outcomes for these girls.
>
> In Kenya, the iMlango project, using an online maths package which incorporates continuous assessment of each child, reported that the project empowered teachers with the diagnostic insights they needed to understand and meet each child where they were. Results at endline were positive for both literacy and numeracy.

Girls being tested in a language other than the language of instruction is a challenge which may have affected learning results

A challenge for some projects was the difference in language of instruction and language spoken at home. This was discussed with projects and learning tests were designed to accommodate multiple languages where possible and deemed appropriate by government authorities. Some projects, such as Camfed International, increased English language support and added refresher classes for girls; others increased reading practice time. However, in a number of projects, language has understandably been cited in both midline and endline reports as a challenge which may have affected results (see the GEC paper on this subject for further details.)

5. Key lessons

The following points have emerged from the independent evaluations of selected projects, projects' own reports, monitoring by the Fund Manager and engagement via joint webinars and directly with project staff.

GEC projects across multiple different contexts found that some types of behaviour and attitudes which may be detrimental to girls' learning are culturally embedded, in teachers as well as students – enabling teachers to recognise and address this is an important step in changing pedagogical approaches (as described by WUSC). Several projects apparent (Discovery, Save the Children, Peas) shifted their approach to include more awareness work

with teachers as the deep seated nature of attitudes has become more. Specific lessons include:

- **Training in Gender Responsive Pedagogy can be effective in redress gender imbalances** – this was a popular approach and many teachers were surprised at the level of unconscious bias they had towards boys. Following teacher training, girls reported a much 'friendlier' attitude from teachers in the classroom and there were reports across the portfolio of increased teacher-student interaction. Evaluators noted the importance of including both male and female teachers in training about gender sensitivity.

  In Northern Kenya, WUSC reported an example of a teacher who thought he was helping girls by not asking them difficult questions (so as not to humiliate them) rather than testing and stretching them in the same way as boys. Through training, teachers were made aware of different learning styles and of how their own background affects the way they teach. By adapting their practice, they saw the effect of simple changes in their style and approach in liberating girls to learn more effectively. However, as the GEC Evaluation Manager noted in its endline reports (Coffey, 2017), this focus did not appear to have a clear correlation with improved learning and may well have been emphasised at the cost of more impactful training such as specific subject focused inputs.

- **Literacy and numeracy coaching for teachers may entail a review and re-sequencing of the curriculum so that it is more developmentally appropriate.** A particularly successful activity was that of the specific introduction of learning using phonics where this was not previously the approach (for example, EDT in Kenya and VIVA in Uganda). This is internationally acknowledged as a successful approach to teaching reading (Henbest, and Apel, 2017) and was effective in improving scores in EGRA testing.

- **Training needs to be repeated and reinforced –** projects found that carrying out one-off training was not generally successful and that in-school training which was progressive over a period of one or two school years was more successful and sustainable. Practical follow up is vital, for example, running practice sessions to rehearse new methodologies. Teacher networking is an effective way of sustaining and embedding training. A number of projects used technology to support this (e.g. video, WhatsApp and YouTube).

- **Training increases motivation and teacher attendance** – qualitative data showed that teachers consistently valued training and many projects reported an increase in motivation and attendance of teachers as a result. This was particularly the case in the situations below.

  - Where teachers were assigned mentors, for example, in the VIVA project in Uganda and Link Community Development's project in Ethiopia;
  - Where teachers were encouraged to work together through 'lesson study' or similar reflective discussion and support, for example, projects implemented by Education Development Trust and by Discovery Alliance;

- Where effort was made to show teachers they were valued within the community through Teacher of the Week or similar schemes.

- **Technology can play a crucial role in training teachers and in their continuing support,** as well as being increasingly useful in teaching and learning processes themselves, boosting student motivation and facilitating more child-centred, inquiry-based approaches to teaching (See the thematic paper on Educational Technology for further details.)

- **Additional, direct learning support, including peer mentoring and learning support, helps girls catch up and learn** – these were usually provided through extra-curricular interventions and helped girls to catch up on missed learning or to deepen their understanding of topics they found difficult. (See the thematic paper on extra-curricular and co-curricular activities for further detail.)

- **Girls themselves are instrumental in teaching, learning and assessment processes** – a common feature of the more successful projects was the inclusion of some kind of peer mentoring scheme designed to support girls who were in danger of failing or dropping out of school by facilitating one-to-one support from a peer to help with academic work. The logic for this type of intervention resonates with research which shows peer mentoring to be highly beneficial not only for those being mentored but also for the mentors themselves (Powell, 1997).

  BRAC Afghanistan, for example, eventually trained a total of over 4000 girls as mentors, having identified it as a key strategy for improving learning outcomes. The evaluation reported that 'mentored girls at endline have increased their reading fluency and numeracy much more than girls without a mentor' (BRAC Afghanistan Endline Report, 2017). This strategy is also helpful to overcome perceptions about certain skills and topics, such as mathematics, by pairing girls who lack confidence with ones who enjoy the subject. ChildHope in Ethiopia emphasised the importance of 'training' students about effective pedagogies and about how they can support their teachers.

- **A critical mass is needed to embed new pedagogies** – it was found very important to train sufficient numbers of teachers within each school and to ensure that the head teacher and senior teachers were also trained in a particular approach so that they could not only support the newly trained teachers but also ensure new ways of working were embedded.

- **The mode of delivery of teacher training affects the impact of it** – experience across the portfolio highlights the following learning points:
    - The importance of involving the head teacher, however the training is delivered
    - The importance of training both male and female teachers about gender sensitivity
    - The importance of school-based teacher development, involving practice sessions
    - The benefits of identifying 'resource teachers' who receive more exposure to training and are then responsible for sharing and promoting new methods with colleagues

- The potential value in "taking lessons from the classroom to the village" to challenge local value systems and approaches to men and women.

- **Language of instruction is pivotal when seeking to improve teaching and learning** – some projects, such as Camfed International, stepped up English language support and adding refresher classes during the project; others increased reading practice time. However, in a number of projects, language has understandably been cited in both midline and endline reports as a challenge which may have affected results. Several endline evaluations noted that content provided through internet based learning platforms is often in English or languages other than mother tongue, exacerbating the problem.

- **Assessment for Learning has potential for transforming student attitudes** – often considered too challenging to introduce in GEC type contexts, those projects that have used it have seen encouraging results, as illustrated in this example:

  One student was failing physics when she joined ENGINE's programme. Over the course of the programme, her physics grade improved dramatically and she is now passing the subject. When asked what had allowed her to improve her grade, she noted two things. Firstly, she highlighted how the ENGINE teacher had responded to her initial slow progress by simplifying the subject matter, and teaching her at her own learning speed. Secondly, she mentioned that the smaller class sizes – up to a maximum of 25 students as compared to over 40 in some government schools – allowed the teacher to assess and respond to her needs more easily than might be possible in a larger class.

- **Effects of improved teaching and learning processes seem to be accentuated when used in extra-curricular settings** – this may be due to the absence of curriculum restriction, allowing more time on specific literacy and numeracy catch up. For example, Link Community Development in Ethiopia trained tutors to respond to individual students' needs, rather than providing generic support, also reiterating the importance of assessment for learning.

- **Well-designed accelerated learning programmes (ALP) can provide a turning point for girls who have missed out on education** – whilst all GEC projects aimed to accelerate learning outcomes, those which delivered specially designed catch-up programmes saw healthy take up and low dropout, reflecting the high levels of demand for girls' education when girls have missed out on large parts of their primary level education. From a teaching and learning perspective, these initiatives offered the most intensive opportunity for supporting girls who have missed out, and gave them a second chance of a full cycle of education.

- **Engagement with local and national education authorities is vital in order to discuss how learning from their project can be translated to broader large-scale provision** – this is important when interventions with teachers are sometimes constrained by broader systemic challenges such as large, multi-grade classes, teacher workload, and sudden redeployment of teachers. Inclusion of ministries of education in classroom observations enables conversations about areas for enhanced

teacher support which governments can then follow up on through in-service teacher training programmes.

Sustaining Change

A number of projects found benefits in investing in follow up to training, often more than they had planned. This helped when teachers were being encouraged and trained to adopt some aspects of a new pedagogy (e.g. group work) but struggled to embed this to a point where they could use it to be more regularly creative and active as a teacher - changing the teaching mind-set takes time and requires structured support. Projects that are continuing into the second phase of GEC will have more time to test approaches and to embed and sustain the changes.

Examples of follow up activity include micro teaching (teachers practising new pedagogical techniques on their fellow teachers in a role play exercise) with peer review, peer support and teacher-to-teacher mentoring, teacher networks to continue sharing ideas and experiences, including using technology, teacher self-reflection journals and new resources to support new practices – involving teachers in the development of these.

Project interventions with teachers are sometimes constrained by broader systemic challenges such as large, multi-grade classes, teacher workload, or sudden redeployment of teachers. Those projects which engaged in consultation with local and national education authorities early on in their project found it much easier to gain the attention of these stakeholders as their midline and endline results emerged, and to move onto discussions about how learning from the project level can be translated to broader large scale provision.

6. Considerations for practitioners and policy makers

It is clear from the experience and performance of individual projects and of the GEC portfolio as a whole that teaching and learning processes are a central and crucial contribution to improved learning outcomes for girls. This should not come as a surprise but it is still helpful to note the number of projects which did not initially make the quality of teaching a clear priority and did not intentionally design teaching and learning support to address specific shortcomings and gaps in the skills pupils were gaining.

When projects prioritised support and investment in teachers, the effect has been positive, but the potential impact was sometimes diminished by incomplete analysis of the needs, and unsupported assumptions about what was needed. In addition, the ways that teachers were trained, the design of the training and the extent (or absence of) follow up and continuing support have all been signalled as areas which could be expanded. The quality of teacher training itself is an area which warrants more investigation, for example to challenge the predominance of 'cascade' methods[3] and find out more about the potential for training and

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[3] Cascade methods are where one or two teachers in a school are trained and then expected to train other teachers in their school, sometimes with several layers

follow up via technology. The GEC will continue to provide context-specific evidence to contribute in this area during the next phase.

Assumptions were also made in setting the indicators used to assess the success of teaching and learning interventions and the indicators did not always prove to be valid predictors of eventual improvements in student learning outcomes. It is clear that in order to measure change and progress in nuanced areas such as gender responsiveness, sensitively crafted tools are needed to capture shifts in underlying dynamics in the classroom.

The results, lessons and conclusions presented in this paper lead us to some key principles to take forward into the next phase of GEC and which may be of use for other practitioners and policy makers:

- Focused effort in the initial and continuing diagnosis of student learning needs is essential, followed by relevant teacher training design, incorporating the use of assessment. The GEC evidence suggests the importance of continuous use of assessment for learning in diagnosing girls' starting points and teaching to not only increase knowledge and understanding but in regularly plugging gaps in both these areas.

- The mode of training and supporting teachers should be carefully considered and thought given to more creative modes of teacher training, which can reach more teachers. This includes providing support to teachers on an ongoing basis – one off training models are not sufficient. These need to be combined with in-class support, peer-to-peer learning and good quality resources to help teachers as well as students deepen their understanding of curriculum content.

- Selection of teaching and learning resources, including the development of new resources, must take language of instruction into account in order to maximise the use and reach of resources as tangible and sustainable contributions to improved learning. It is important students understand concepts in a language which is familiar to them. In order for students to be successful learners in a language that is not familiar to them teachers need to teach in a way that takes into account the language gaps.

- To ensure that investment in teacher training and support is delivering value for money, detailed attention must be given to the tools of measurement used to assess the effectiveness of interventions. This includes having a robust evidence base on what teaching and learning practices are like at the beginning, middle and end of interventions and to map how these have changed and why.

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Annexes

Annex 1: GEC project interventions involving teaching and learning and assessment for learning processes

Lead Partner	Country	Window	Teaching, Learning and Assessment								
			Skills Training for Active T&L	Gender Responsive Pedagogy	Accelerating Learning	Targeted Focus on Literacy	Targeted Focus on Numeracy	Use of formative assessment	Teacher peer support, training and mentoring	Formal Preservice teacher training	Inclusive classroom strategies
Theatre for Change	Malawi	IW	c	c		p					c
VSO	Mozambique	IW		c	p				p		
Mercy Corps Scotland	Nepal	IW	c								
VSO	Nepal	IW	c	c							c
BRAC Maendeleo	Tanzania	IW	c								
Camfed	Zambia	IW							c	c	
Link Community Dev't	Ethiopia	IW		c					c		
I Choose Life - Africa	Kenya	IW		p				c			
Leonard Cheshire	Kenya	IW									c
Haelth Ltd	Rwanda	IW						c	c		
Cheshire Services	Uganda	IW	c			c	c				c
Raising Voices	Uganda	IW	c	p							p
Opportunity	Uganda	IW	p			p					
PEAS	Uganda	IW	c	c				c			c
Viva	Uganda	IW	c	p	c	c		c			c
Eco-fuel Africa Ltd	Uganda	IW	c			c					
Varkey Foundation	Ghana	IW	c	p					p		c
Childfund	Afghanistan	IW	c	c		p			c		p
Red een Kind	South Sudan	IW	p	p							
Save the Children	Mozambique	SCW	c	p		c	c		c		
World Vision	Zimbabwe	SCW				c					
Camfed	Zimbabwe	SCW	c			c	c				
IRC	DRC	SCW		c							
Childhope UK	Ethiopia	SCW	c	p		c					
Save the Children	Ethiopia	SCW		c		c					
CfBT Education Trust	Kenya	SCW		c				p	c		
WUSC	Kenya	SCW		c				c			
Plan International UK	Sierra Leone	SCW	c	c					c	p	c
Plan 2	Sierra Leone	SCW	c	c				p	c		
BRAC	Afganistan	SCW	c			p					c
Aga Khan Foundation	Afganistan	SCW	p	c	c	p			c	p	p
ACTED	Afganistan	SCW		c	c	p					
Care International UK	Somalia	SCW		c					p	p	c
Relief International	Somalia	SCW		c		c				p	
Ericsson	Burma	SP	c								
Avanti	Kenya	SP	c					c		p	
Discovery	Ghana	SP	c	c					p	p	
Coca Cola	Nigeria	SP									