Leading, Teaching and Learning Together

A baseline report of the secondary education programme in 14 districts in Rwanda

September 2019

Leaders in Teaching

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List of abbreviations and acronyms

CBC	Competence Based Curriculum
CoP	Community of Practice
CPD	Continuous Professional Development
DDE	District Director of Education
DEO	District Education Officer
DHT	Deputy Head Teacher
FGD	Focus Group Discussion
HT	Head Teacher
LTLT	Leading, Teaching and Learning Together
McF	Mastercard Foundation
M&E	Monitoring and Evaluation
NAT	Newly Assigned Teacher
NQT	Newly Qualified Teacher
OECD	The Organisation for Economic Co-operation and Development
PCK	Pedagogical Content Knowledge
PLC	Professional Learning Communities
REB	Rwanda Education Board
SBM	School Based Mentor
SD	Standard Deviation
SEO	Sector Education Officer
SL	School Leadership
SSL	School Subject Leader
STEM	Science Technology Engineering Mathematics
TTC	Teacher Training College
UR-CE	University of Rwanda-College of Education
VVOB	Flemish Association for Development Cooperation and Technical Assistance
W-RBNS	Work-Related Basic Need Satisfaction

Executive summary

This report presents the baseline findings of an outcome evaluation of the Leading, Teaching and Learning Together (LTLT) in secondary education programme. The LTLT programme runs from 2018 until 2021 and is rolled out in 14 districts in Rwanda targeting a total of 680 secondary schools. The main objective of the programme is to improve the quality of secondary education in Rwanda by strengthening the competences of key education actors through improved Continuous Professional Development (CPD) support systems for these actors. Actors that are directly targeted by the programme are: Sector Education Officers (SEOs), School leaders (headteachers and deputy headteachers), School Based Mentors (SBMs) and School Subject Leaders (SSLs) in Science, Technology, Engineering and Mathematics (STEM). Actors that are indirectly targeted include (new) teachers and students.

To establish improved CPD support systems for key education actors, the LTLT programme offers CPD support through two modalities:

1. Training Programmes on effective school leadership for school leaders and on educational mentorship and coaching for SBMs and SSLs;

2. Professional Learning Communities (PLCs) for headteachers at sector level and Communities of Practice (CoP) for (new) teachers at school level.

Ultimately, the programme aims to provide young Rwandans with the skills and competences to succeed in the 21st century. The programme is a collaboration between VVOB, the Rwanda Education Board (REB) and the University of Rwanda College of Education (UR-CE). It is funded by the Mastercard Foundation (McF).

Objectives of this baseline study

This baseline study is part of a larger evaluation which aims to assess the effectiveness of the LTLT programme interventions through a longitudinal mixed methods approach. In line with the programme's main objective, the three main objectives of this baseline study were:

1. To assess the baseline status of the CPD support system for SEOs, school leaders, SBMs, STEM SSLs and (new) teachers, looking specifically at the following interventions:
   • PLCs for headteachers;
   • CPD for school staff;
   • Professional networks;
   • Induction programmes and CoP for new teachers.

2. To assess the competences/motivation of key educational actors looking specifically at the following:
   • School leaders' competence to effectively lead schools;
   • SEOs' competence to coach and mentor headteachers through PLCs;
   • SBMs' and SSLs' competence to coach and mentor teachers including STEM teachers;
   • Intrinsic and extrinsic motivation of (new) teachers to conduct their main teaching roles.

3. To understand whether the participation of school leaders in the CPD diploma programme has any intermediate effects on:
   • The participation of school leaders in PLCs;
   • CPD support system for new teachers;
   • The competence of school leaders to lead their schools effectively.

A mixed methods study using surveys, in-depth interviews and Focus Group Discussions (FGDs) was conducted among the beneficiaries (School leaders N=256, SEOs N=135, SBMs N=232, STEM SSLs N=249, new teachers N=227 and students) in a representative sample of 247 schools which will be followed over time (baseline and endline). The sample of 247 schools includes all 95 schools where none of the education actors had been trained yet under the LTLT programme at the time of the baseline (baseline group) and all 152 schools where headteachers and deputy headteachers started the diploma programme in September 2018 (school leadership group). 14 Schools from the baseline sample (1 per district) were selected for the qualitative research. To answer objectives 1 and 2, we only study the sample of baseline schools (n=95) while for objective 3 we study the full sample (n=247) and compare the two groups.

Baseline status of the CPD support system

Building a CPD support system at both school and sector level is one of the major expected outcomes of the LTLT programme. The baseline findings on the PLCs at sector level show that participation rates in PLCs are high, that school leaders are motivated to take part in such PLCs even without taking part in the diploma programme and that school leaders greatly value such networks. We further found that training SEOs helps to initiate PLCs and may also be the main reason why participation rates in PLCs are so high. Indeed, trained SEOs are more likely to initiate PLCs and promote participation in PLCs.

When it comes to school based CPD, findings show that CPD for teaching staff is still limited and that there is inequality in the provision of CPD. Some school actors (i.e. headteachers and SBMs) have more access to CPD than others and report larger social networks. We also note that CPD is mostly organised through formal timetabled staff meetings and that personalised needs-based CPD is uncommon. At a majority of the 14 schools where the qualitative study took place, CPD was found to never takes place or was organised in a very adhoc manner. A concerning finding is that especially new teachers and STEM school subject leaders have limited to no access to formal training, including training on Pedagogical Content Knowledge and classroom and behaviour management. In general, the time available for CPD is very limited and SBMs and STEM SSLs find it very challenging to combine the organisation of CPD with their teaching.

We also studied whether induction programmes were available for new teachers. More than half of the baseline schools already have formal induction programmes for new teachers in place. Although it is positive that such large numbers of schools already have induction programmes, in-depth interviews with new teachers reveal that the content of such programmes could be improved. Currently, the induction programmes focus on familiarizing new teachers with the work environment and addressing direct concerns. A more standard oriented induction (i.e. providing support to new teachers so that they can grow in their profession based on a shared understanding of teaching and learning) and attention for personal/emotional support seems to be lacking.

When it comes to CoPs at school level, we note that only a little more than a third of the new teachers took part in a CoP in the past 12 months which is much lower than the participation rates in PLCs. Contrary to the SEOs, the surveyed SBMs and SSLs had not started their certificate programme yet and this is likely to explain this finding.

Assessment of the competences/motivation of key education actors

Within the LTLT programme the capacity of various school actors is built and consequently it is expected that the programme will have an impact on their competence to coach and mentor (SEOs, SBMs and STEM SSLs) and to lead their schools effectively (school leaders). In turn, improvements in the provision of CPD at school level are expected to improve teacher motivation.

Baseline findings on competences of school leaders to lead their schools effectively show mixed results. When looking at each individual standard of school leadership, school leaders give themselves a medium to high rating on the application of each of these standards. This opinion is shared by SBMs, SLLs and new teachers who agree that school leaders are already leading their schools effectively. However, when looking at how many school leaders report high competence on all five standards simultaneously, only about a third of school leaders indicate that this is the case. This implies that although school leaders can apply each individual standard, they have more difficulty keeping all the standards high at the same time.

A majority of the SEOs in the baseline sample had already been trained. As such, SEOs were asked to report on their perceived confidence to coach and mentor school leaders before and after the training programme. Looking at their perceptions, we note large and significant changes in their levels of confidence before versus after the training programme with 70% of the SEOs indicating to feel very confident about mentoring and coaching headteachers after the training programme.

At baseline, around half of the SBMs and STEM SSLs felt very confident and able to conduct the various tasks related to their roles as an SBM and STEM SSL. Though it is positive that such a large number of SBMs already indicate that they feel very confident and able, it also shows that quite a significant number of SBMs and STEM SSLs does not feel ready yet to conduct their roles.

This baseline study also assessed the motivation of new teachers. We note that on the whole new teachers are motivated and that intrinsic and extrinsic factors are equally driving their motivation. Still, almost one fifth of new teachers indicated to have considered leaving the teaching profession in the past 12 months. SSLs further expressed their worries about the workload of STEM teachers and the ability of the school to retain them. In addition, when considering the three main teaching roles combined (teaching, lesson preparation and administration) only 61% of the new teachers had very high intrinsic motivation across all three roles.

Intermediate effects of the school leadership diploma programme

Though the school leaders were only halfway their diploma programme, we already note a few positive changes. First, there is a positive impact on new teachers' exposure to training on content and behaviour and class management. Secondly, school leaders that started the diploma programme were more often rated as very effective by new teachers. Given that we also note an increase in exposure to training among new teachers, it could very well be that the more positive appraisal of their headteacher is linked to increased satisfaction with the work environment. In contrast, we did not find any relationship so far between participation in the school leadership diploma programme and the competence of school leaders to lead their schools effectively; participation of school leaders in PLCs; and the participation of new teachers in CoPs.

Recommendations

To improve the implementation of the LTLT programme, several recommendations can be made. Important lessons can be learned from the success of SEOs in establishing PLCs and enhancing participation rates. Since parallels can be drawn between the PLCs and CoPs, these lessons can be taken forward in the course material on CoPs. In addition to improving the implementation of CoPs, it is important to pay attention to equality in the provision of CPD at school-level. Particular attention should be paid to ensuring that trainings provided to the SBM are cascaded down to the new teacher and the SSL. Also, awareness could be created by including equality in the provision of CPD as a topic for discussion in PLCs. Attention should also go to ensuring that CPD remains needs-based and that time-tabled group sessions do not replace individual coaching sessions. To achieve such goals, it will be essential to keep advocating for more time for the SBM and SSL to organise and facilitate CPD. When it comes to induction programmes, SBMs can be empowered to focus more on the content of such induction programmes and ensure that standard oriented inductions are implemented.

In general, it should be acknowledged at the start and throughout the CPD training programmes offered by VVOB, REB and the UR-CE, that trainees have different starting points and needs. It is wise to tailor support to the specific needs of the trainees. This could imply particularly focusing on weaker performing trainees during field visits. In the diploma programme for school leaders, there could be more focus on the inter-relatedness between the five standards and on ensuring a holistic school improvement plan is developed which addresses the inter-relatedness.

School leaders, SBMs and STEM SSLs appear to have different perceptions about the school environment, retention of (new) teachers and workload. It is of importance to understand more deeply what motivates new teachers to stay or leave the teaching profession and how the LTLT programme can contribute to this decision in a positive way.

1. Introduction and background

This report provides the baseline results of an outcome evaluation of the Leading, Teaching and Learning Together programme in secondary education in Rwanda. This report has been prepared by the M&E and Research Team of VVOB Rwanda in cooperation with The Research Base.[1]

Teachers and school leaders are the two most critical sets of actors in raising the quality of primary and secondary education (Rowe, 2003). Teachers are crucial when it comes to improving learning outcomes and learner wellbeing (Hattie, 2003, 2008). School leaders who support, evaluate and develop teacher quality and create a positive learning environment also have a high impact on learning outcomes (Leithwood, Harris, & Hopkins, 2008).

While Rwanda has been successful in getting more students into the education system, ensuring that they transition through the system and gain the correct skills needed for the labour market is a challenge (McF, 2017).

One of the key factors that drives learning outcomes and helps students' transition through the education system is teaching quality (Rowe, 2003). Although in Rwanda 77% of the secondary education teachers was considered qualified in 2018 (MINEDUC, 2018), teachers often have insufficient teacher competences in subject content, pedagogy and languages of instruction (English and Kinyarwanda). The availability of in-service Continuous Professional Development (CPD) for teachers is limited (MINEDUC, 2007) as well as access to and usage of ICT in education (MINEDUC, 2016). School leaders play an important role in motivating teachers to invest in professional development and sustaining a learner friendly school climate. Hence, to raise the quality of teaching, teachers not only need sufficient CPD, they should also be supported by their school leaders in their professional development.

The Leading, Teaching and Learning Together in secondary education programme

In response to the challenges in teaching quality, VVOB in partnership with the Rwanda Education Board (REB) and the University of Rwanda College of Education (UR-CE) and with funding from the Mastercard Foundation (McF) have set up a programme called "Leading, Learning and Teaching Together in secondary education".

The Leading, Teaching and Learning Together (LTLT) in secondary education programme runs from 2018 to 2021 and is rolled out in 14 districts in Rwanda, targeting 680 secondary schools. The programme is part of a wider McF initiative called 'Leaders in Teaching' (McF, 2017) which aims to improve the quality and relevance of teaching and learning in Sub-Saharan Africa. The programme's long-term objective is to provide young Rwandans with the skills and competences to succeed in the 21st century.

The short-term objective of the programme is to strengthen the competences of key education actors through improved CPD support systems for these actors. Actors that are directly targeted by the programme are: Sector Education Officers (SEOs), School leaders (headteachers and deputy headteachers), School Based Mentors (SBMs) and school subject leaders (SSLs) in Science, Technology, Engineering and Mathematics (STEM). Though teachers are not directly targeted, the programme aims to reach them indirectly through the key education actors. To this end, and as also described further below, key actors can set up several interventions for teachers (e.g. Communities of Practice) and promote a practice of lifelong learning in their schools.

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1   The Research Base is a UK-based consultancy firm that was commissioned to provide technical advice in this baseline study.

To establish improved CPD support systems for key education actors, the LTLT programme offers CPD support through two modalities:

1.   Training Programmes on effective school leadership for school leaders and on educational mentorship and coaching for SBMs and SSLs;

2.   Professional Learning Communities (PLCs) for headteachers and Communities of Practice (CoPs) for (new) teachers.

The LTLT programme builds on the 'Girls on Mars' Programme in primary education which started in 2017 and targets 6 districts of which three overlap with the secondary education programme (**see Figure 1**). The Girls on Mars programme offers the same CPD modalities but only targets primary schools.

Figure 1. Implementation districts of the Leading, Teaching and Learning Together programme in primary and secondary education
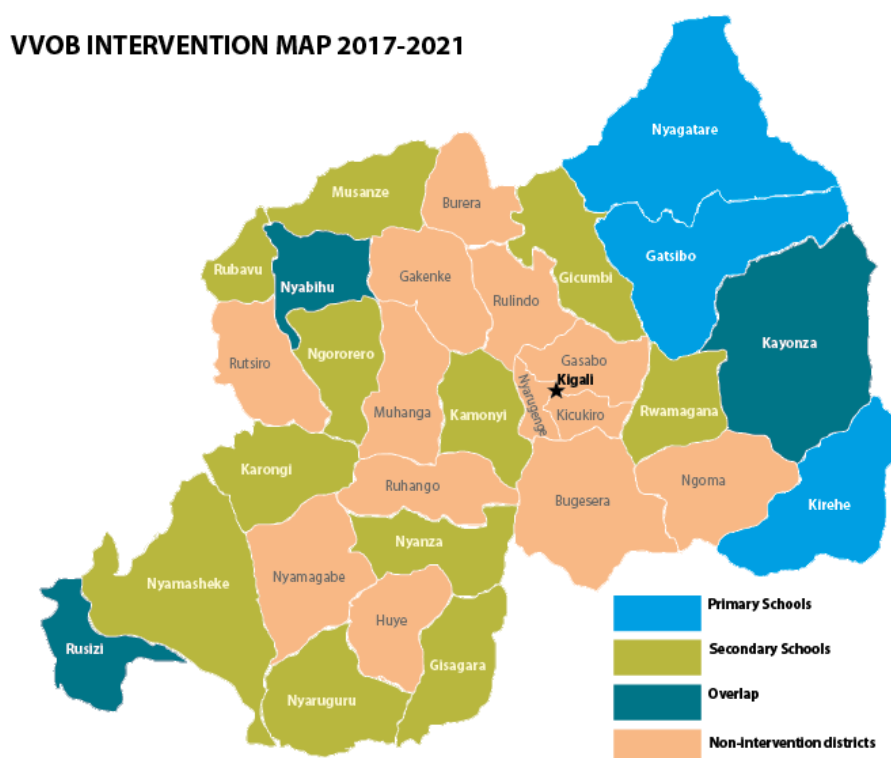
Within the LTLT programme, six outputs have been identified, which describe CPD services for school leaders and teachers. The services (**see Figure 2**) target key actors in the school ecosystem and reflect characteristics of effective CPD: services are sustained and intensive, emphasize learning by doing, start from existing practices and challenges and focus on students' learning outcomes and wellbeing (UR-CE, VVOB & REB, 2018b).

Figure 2. Intervention logic
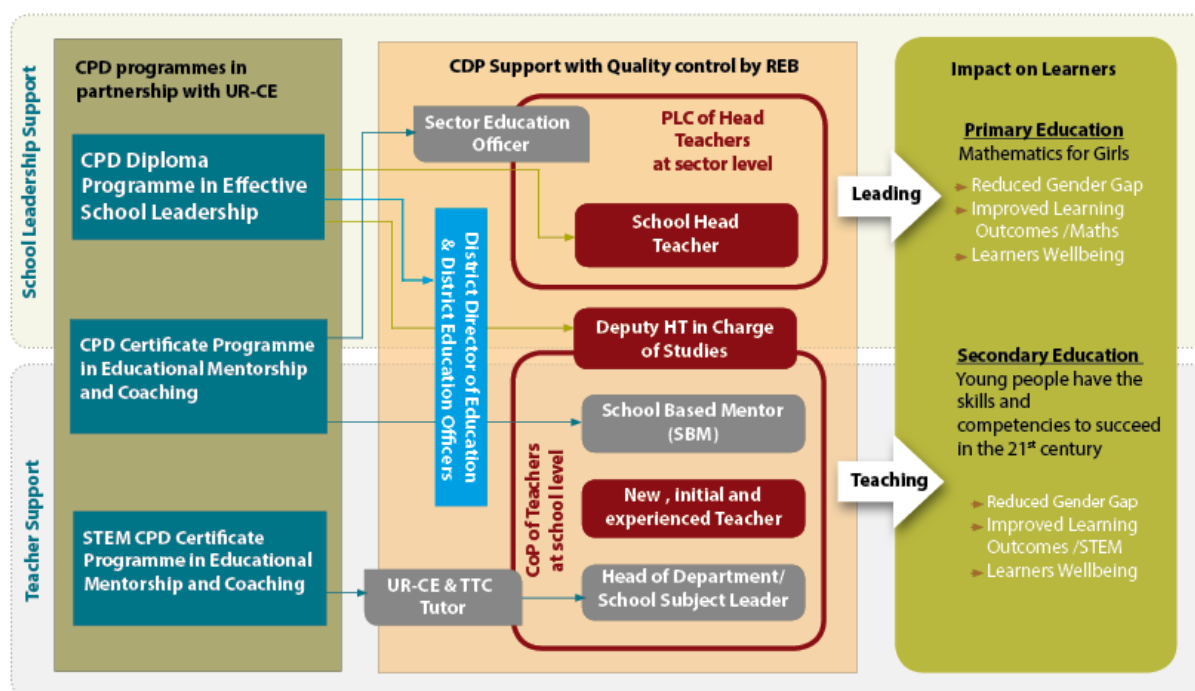
School leadership Support Interventions

Professional development of school leaders throughout their careers is one of the linchpins of VVOB's approach to school leadership. It is often assumed that good teachers will make good school leaders and that they will learn school leadership "on the job". However, not only are the knowledge, skills and attitudes that are required for headteachers different from those required for teachers, headteachers also need to develop their identity as a headteacher. This search for identity, as well as the "structural loneliness" of a headteacher, often leads to anxiety (Kelchtermans, Piot, & Ballet, 2011). This is enhanced by the increasing complexity and diversification of leadership in schools, where deputy headteachers, mentor teachers, School General Assembly Committees and others assume leadership roles.

Collaboration between VVOB and the UR-CE led to the development of a **CPD Diploma programme in Effective School Leadership**. The CPD diploma programme is offered by the University of Rwanda - College of Education and aims at equipping Headteachers and Deputy Headteachers with the competences to fulfil their roles as school leaders. Five standards for effective school leadership form the backbone of the programme (**see Figure 3**). Attention is paid to both concentrated (leadership is concentrated in the person of the formal leader) and distributed (leadership is shared by several members of the organization) forms of leadership, inclusive education and both task and emotional dimensions of school leadership. The CPD diploma programme is offered as a year-long programme with 18 contact days (16 training days and 2 examination days). As of 2019, the diploma programme will be offered as a blended learning programme. In between face to face sessions, participants will take part in online discussions, activities and readings.

Figure 3. Five standards of school leadership
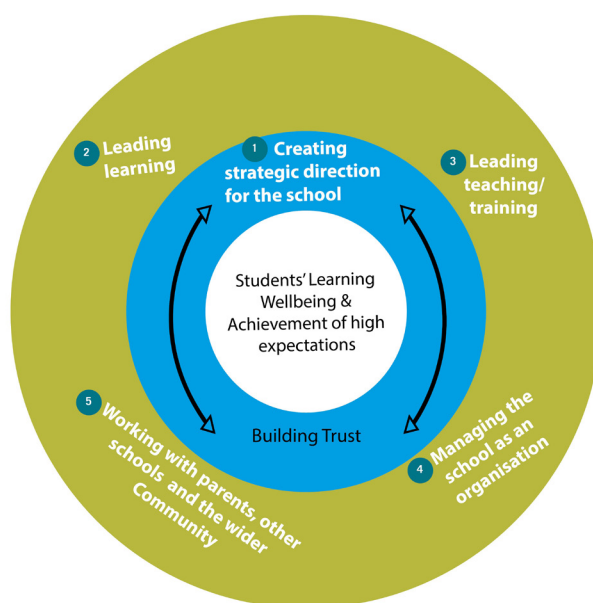
Research shows that trainings alone are insufficient and need to be complemented by strategies that provide continuous support on the job (Ingvarson, Meiers, & Beavis, 2005; Vescio, Ross, & Adams, 2008). Within the LTLT programme, Headteachers and Deputy Headteachers are therefore also engaged in **PLCs** at the level of their administrative sector. Kools & Stoll (2016) explain PLCs as "an inclusive and mutually supportive group of people with a collaborative, reflective and growth-oriented approach towards investigating and learning more about their practice in order to improve all students' learning". PLCs within the LTLT programme follow a structured action-oriented annual cycle which consists of four phases: (1) Identifying a PLC priority and developing Specific, Measurable, Attainable, Realistic and Timely (SMART) objectives; (2) Identifying possible strategies and planning for implementation; (3) Reviewing findings and developing the final strategy; and (4) Reflecting on lessons learned after implementation and planning for dissemination.

To make sure that PLCs are facilitated in an effective manner, Sector Education Officers follow a **CPD certificate programme on Educational Mentorship and Coaching** and facilitate such PLCs for headteachers on a quarterly basis. The certificate programme is also offered by the University of Rwanda – College of Education with 9 contact days (8 training days and 1 examination day) over a period of 8 months.

In summary, the school leadership support system consists of the following three interventions:

> **Output 1:** A CPD Diploma course on School Leadership for Headteachers and Deputy Headteachers;

> **Output 2:** A General CPD Certificate course on Coaching, Mentoring and PLCs for SEOs and engagement of District Directors of Education;

> **Output 3:** CPD support in PLCs of School Leaders at sector level, with coaching by trained SEOs and supervision by District Directors of Education.

Teacher Support Interventions

The Rwandan Teacher Development Management policy calls for a better link between pre-service teacher education and CPD, and a harmonized and free-flowing Initial Teacher Training/CPD teacher development system. Improving the quality of teaching is a career long process. To institutionalise this ongoing process after initial training, the Rwanda Education Board has developed the SBM Programme Framework (REB, 2016). The support and guidance (including mentoring) provided by SBMs to newly qualified, junior, senior and master teachers is about building the teaching profession, keeping them in the teaching profession and ensuring that they are part of a learning community focused on continually improving teaching and learning. Because of a high workload, many SBMs are unable to provide the expected support and guidance. Within the LTLT programme, successful induction and needs-based continuous teacher professional development are not the responsibility of one person in the school. Professional support is embedded in a school-wide support system, enhanced by a cooperation with teacher education institutions, where school leaders, mentor teachers, subject leaders and other teachers (through CoPs) all have a role to play.

To make sure SBMs and STEM SSLs are equipped with the competences to guide and organize school-based CPD and coach and mentor (new) teachers, SBMs and SSLs benefit from a **CPD Certificate programme in Educational Mentorship and Coaching and a CPD certificate programme in Educational Mentorship and coaching for STEM SSLs/Heads of Department**. Both certificate programmes focus on teacher development as an ongoing process in a teacher's career including the induction of new (STEM) teachers and peer learning through CoPs. The programmes also train SBMs and SSLs to coach fellow teachers, to plan CPD based on teachers' professional development needs, to observe lessons and facilitate lesson study, and to take gender into consideration when facilitating CPD activities. In the STEM certificate programme additional attention is paid to pedagogical content knowledge for STEM and STEM leadership.

Similar to what happens at sector level through PLCs, **CoPs** are organized for teachers at schools by the SBMs, in collaboration with the STEM SSLs, the headteacher or the deputy headteacher. Activities within CoPs may include collaborative lesson preparation, lesson study/observation, case discussions, analysing student work on assessments, analysing marking and record keeping systems, or developing strategies for teaching learners with special educational needs (SEN).

In summary, the teacher support system consists of the following three interventions:

› **Output 4:** A General CPD Certificate course on Coaching, Mentoring and PLCs for SBMs;

› **Output 5:** A STEM CPD Certificate course on Coaching, Mentoring and PLCs for STEM Heads of Department or SSLs (aligned with school level support by AIMS);

› **Output 6:** CPD support through induction programmes and CoPs for (new) teachers in schools, with coaching by School Based Mentors and STEM School Subject Leaders, and supervision by Deputy Headteachers.

Implementation of the programme

To reach all 680 secondary schools and optimize the delivery of the CPD training programmes, the different direct beneficiary groups (HT/DHT, SBMs, SSLs) follow the CPD training programmes at different timepoints. Trainees are randomly assigned to one of three training cohorts, except for SEOs who are, in principle, all trained at the same time; hence the assumption is that for each CPD training programme, the three cohorts are equal in terms of background characteristics. At the time of this baseline study, the first cohort of SBMs, SSLs and SEOs had been fully trained while the first cohort of HTs and DHTs were still being trained. Cohort two of HT/DHT, SBMs and SSLs had not started their training yet. The action-oriented PLCs of headteachers were initiated in February 2019 during a first PLC session.

Table 1. Overview of planned number of trainees to be reached

Actor	First cohort 2018[1]	Second cohort 2019[1]	Third cohort 2020[1]	2021[2]	Total
HT	171	127	126	N.A.	568[3]
DHT	240	220	220	N.A.	680
SEO	139	44	N.A.[2]	N.A.	152
SBM	227	170	171	N.A.	568[3]
STEM SSL	454	453	453	N.A.	1504[4]

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1   Random selection from total pool of trainees
2   Cohort will consist of trainees that were unable to complete/enrol for the course in an earlier cohort
3   There is an overlap with the primary education programme in three districts. Hence 112 schools are not counted
4   Two subject leaders per school are selected

Objectives of this baseline study

This baseline study is part of a larger outcome evaluation in which the effectiveness of the LTLT Programme will be assessed longitudinally through a baseline, midline and endline measurement. The overall aim of this evaluation is to measure the effectiveness of the interventions and provide feedback to support continuous quality improvement.

In line with the programme's intervention logic and outputs (**see Figure 1**) the specific objectives of this baseline study were as follows:

1. To assess the baseline status of the CPD support system for SEOs, school leaders, SBMs, STEM SSLs and (new) teachers, looking specifically at the following interventions:
   • PLCs for headteachers;
   • CPD for school staff;
   • Professional networks;
   • Induction programmes and CoP for new teachers.

2. To assess the competences/motivation of key educational actors looking specifically at the following:
   • School leaders' competence to effectively lead schools;
   • SEOs' competence to coach and mentor headteachers through PLCs;
   • SBMs' and SSLs' competence to coach and mentor teachers including STEM teachers;
   • Intrinsic and extrinsic motivation of (new) teachers to conduct their main teaching roles.

3. To understand whether the participation of school leaders in the CPD diploma programme has any intermediate effects on:
   • The participation of school leaders in PLCs;
   • CPD support system for new teachers;
   • The competence of school leaders to lead their schools effectively.

2. Methodology

Study design

This baseline report is part of an outcome evaluation which applies a longitudinal mixed methods approach. The outcome evaluation is quasi-experimental in design and includes a baseline, midline and endline measurement in all 14 districts that are part of the LTLT in secondary education programme. Respondents and schools will be followed over time and will take part in in-depth interviews, Focus Group Discussions (FGDs) and surveys. To be able to already study intermediary effects of the CPD diploma programme on school leadership at baseline and to study its long-term effects at endline, two groups are included in the evaluation: 1. Schools where no education actors had been trained during the time of the baseline study (so-called baseline schools) and; 2. Schools where the headteacher and deputy headteacher (school leaders) already started the CPD diploma course during the baseline study (so called school leadership (SL) schools). The qualitative research will complement the quantitative research and will focus on 14 baseline schools (one from each district) which will also be followed over time. **Figure 4** provides an overview of the full study design.

Figure 4. Study design

BASELINE STUDY (2019)	
Quantitative research N=95 baseline schools; n=152 SL schools Surveys with SEOs, SLs, SBMs, SSLs and new teachers	**Qualitative research** N=14 schools In-depth interviews with SEOs, SLs, SBMs, SSLs and new teachers, FDGs with STEM students

MIDLINE STUDY (2020)
In depth qualitative research focusing on key challenges identified during baseline study + key informant and staff interviews

ENDLINE STUDY (2021)	
Quantitative research N=95 baseline schools; n=152 SL schools Surveys with SEOs, SLs, SBMs, SSLs and new teachers	**Qualitative research** N=14 schools In-depth interviews with SEO, SLs, SBMs, SSLs and new teachers, FDGs with STEM students

Sampling procedures

Quantitative research

To select a baseline sample of schools from the total sample of 680 schools, we selected all schools where no school actor had been trained yet under the LTLT programme at the time of the baseline study. The total number of schools to be considered for this baseline sample was N=95 schools.

To study intermediate and long-term effects of the CPD support on school leaders, we additionally selected all schools where the headteacher and the deputy headteacher started his/her training under the first training cohort (see table 1). The total number of schools to be considered was N=152 schools. It is important to note that the sample of 152 schools was selected based on the headteacher and deputy headteacher exposure to the training and not any of the other beneficiary groups' exposure. Hence, this sample of 152 schools also included schools where other school actors had been trained under cohort 1 (i.e. SBM or SSL). **Figure 5.** below gives an overview of how schools were selected for both groups.

Figure 5. Flowchart of sampling for the quantitative study
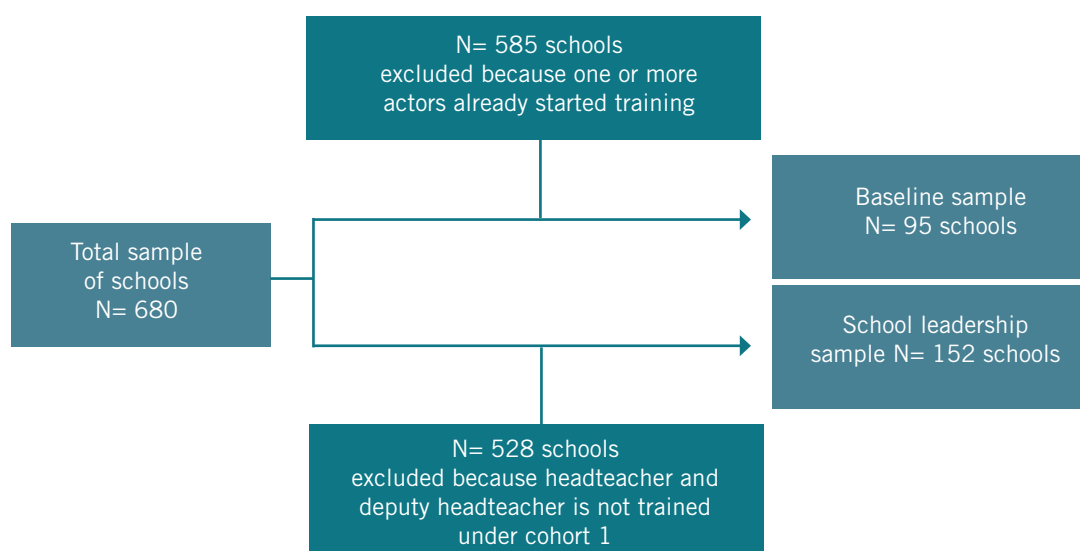
At each of the schools, surveys were administered to the following beneficiary groups (also see **Table 2. Overview of selection of survey respondents**): 1. Headteacher *or* Deputy Headteacher (50/50 and depending on availability); 2. SBM; 3. STEM SSL and; 4. Newly Qualified Teacher (NQT i.e. a teacher that has graduated from a Teacher Training College (TTC) max. 3 years ago). In case of a school having no NQT, a Newly Assigned Teacher (NAT) was selected (i.e. an experienced teacher that has been assigned to the school max. 3 years ago). In case of more than one NQT or NAT being at the school, the respondent was selected at random. In addition to 4 surveys at school level, surveys were conducted with SEOs from the sectors where the 247 schools are located. Since the SEOs are primarily trained under cohort 1, a great majority of the SEOs had already completed the CPD training programme during the time of the baseline study.

Table 2. Overview of selection of survey respondents

Survey respondent	Selection procedure
HT or DHT	50/50 but also depending on availability
SBM	Only one per school
Head of department Mathematics or Sciences	50/50 but also depending on availability
NQT	In case of no NQT an NAT was surveyed
SEO	All SEOs from the sectors where the 247 school are located

Qualitative research

To collect accurate qualitative data, 14 schools were selected from the sample of 95 baseline schools in a purposive manner. From each district a school was selected which was considered representative for the rest of the schools in the district. Background characteristics that were considered when selecting the schools were: type of school (9y basic education, 12y basic education or secondary only) and school status (public, government-aided or private). In addition, at least 3 schools (20%) were included which were led by a female headteacher. At each school an in-depth interview was conducted with the headteacher/deputy headteacher, the SBM or SSL STEM and a new teacher. In addition, a Focus Group Discussion with STEM pupils was conducted at each school as well as an in-depth interview with the SEO of the selected sector.

Study instruments

The surveys were developed based on a document review and existing survey scales. The survey collected quantitative information about beneficiaries' attitudes and impressions. Main concepts covered in the surveys can be found in **Table 3. Concepts covered by the different surveys below.** The questions were closed-ended, facilitating the measurement of any differences between baseline and endline.

Table 3. Concepts covered by the different surveys

Type of survey	Concept covered
School leaders	• Self-efficacy in five standards of school leadership (based on (Tschannen-Moran & Gareis, 2004)) • Exposure to professional development activities by headteacher • Delivery of induction programmes for new teachers • Exposure to professional development activities by teachers • School environment (OECD, 2013)
SBM/STEM SSL	• Attitudes about coaching and mentoring • Confidence main SBM tasks • Exposure to professional development activities • School environment (OECD, 2013) • Delivery of induction programme for new teachers

Type of survey	Concept covered
New teacher	• Motivation (Van den Broeck, Vansteenkiste, De Witte, Soenens, & Lens, 2010) • Motivation (Fernet, Sencal, Guay, Marsh, & Dowson, 2008) • Exposure to professional development activities • Headteacher effectiveness
SEO	• Confidence main SEO tasks • Ability main SEO tasks • Frequency and usefulness of PLCs • Induction programmes for new teachers

The qualitative instruments used were semi-structured interview guides and FGD guides. These instruments all included a set of core questions and probing questions. The questions were open-ended to provide context, detail and perspective to the quantitative findings drawn from the surveys. The in-depth interviews focused on motivation to fulfill roles and duties, professional development activities and networks. FGDs focused on student perceptions of STEM and STEM teachers and general perceptions about the school environment.

All study instruments underwent an extensive piloting phase including translations and back translations from English to Kinyarwanda by a professional translator.

Data collection

Quantitative research

For the quantitative data collection, a team of 15 enumerators were trained in the data collection procedures by the VVOB researcher. Mobile data collection through tablets was conducted using Kinyarwanda versions of the surveys that were uploaded to KoBo toolbox, an open source application which allows for online and offline data collection. All surveys were conducted face-to-face at the schools by the enumerators, limiting the number of data entry errors. In some schools, not all participants could be surveyed. This was due to several factors: i.e. unwillingness to participate, unavailability or the person having left the school. In such a case and where it was possible, enumerators conducted an additional school leadership survey so that both the deputy headteacher and headteacher would be surveyed (n=9). In the end, this resulted in the following sample sizes: School leaders N=256, SEOs N=135, SBMs, N=232, SSLs N=249, new teachers N=227.

Qualitative research

For the qualitative data collection, two local qualitative researchers were trained in the qualitative data collection tools. As part of this training, the qualitative researchers piloted the discussion and interview guide at a secondary school in Kayonza district. This pilot also served to provide some feedback to the researchers about their probing skills.

Data analysis

Quantitative data were analysed using SPSS version 25. Descriptive statistics are presented for both continuous and categorical variables. To make an assessment of the baseline status of the CPD support system and the competence of beneficiaries, we only consider the baseline schools (n=95) when answering objectives one and two. For objective three, data for baseline schools and school leadership schools are presented - differences between the two groups were tested through a bivariate analysis using a Chi-square test for categorical variables and an independent t-test for normally distributed continuous variables. Where a single hypothesis was tested using multiple tests, a Bonferroni correction was applied.

Qualitative data were analysed using a content analysis approach (Dougherty, 2005). Minor and major themes were identified by looking at the frequency (how many participants mentioned a theme) and extensiveness (across how many different sources the theme was mentioned). The qualitative content analysis was conducted in Excel.

To assess the extensiveness of professional networks, an explorative social network analysis was conducted. A social network analysis uncovers social relationships of individuals and groups, structures those relationships and helps to understand how relations and their structures influence (or are influenced by) social behavior, attitudes, beliefs and knowledge (Prell, 2011). Using the in-depth interview data, a sociogram was created for each respondent group in which actors and their relationships were visualized. The direction of the relationship was depicted using directional or bidirectional arrows. The size of the circles/nodes depicts the importance (i.e. were mentioned more frequently) of an actor with bigger circles/nodes indicating more importance.

Ethical considerations

All the study materials including questionnaires and consent forms were reviewed and approved by the Rwanda National Ethics Committee. Each respondent included in the study provided informed consent prior to commencement. Consent forms are stored separately from data to ensure no identifying information can be linked to individual responses. No financial incentives were made available to respondents.

3. Results

Characteristics of survey participants

Characteristics of the baseline sample of participants can be found in **Annex 1. Characteristics of survey participants (baseline sample)**. The survey data shows that there is variation in mean age of participants; the youngest participants are new teachers [mean age 30.9 years (SD 6.7)] and the eldest participants are SEOs and school leaders [mean age HTs 41.8 (SD 6.7) years and SEOs 41.3 (SD 7.4) years]. Females are not well represented across the different groups; the highest percentage of females is found among the new teachers (30.4%) while the lowest percentage is found among the school-based mentors (12.9%). SEOs are the highest educated with 91.1% having completed a Bachelor's in education. SEOs have also been working in their role the longest (6.6 years (SD 2.3) on average), followed by the headteacher/deputy headteacher (4.0 years (SD 3.6) on average). School leaders and SEOs have the best access to internet and a computer/laptop however, there is still a big gap between school leaders and SEOs with SEOs having much better access. It is noteworthy that a majority of surveyed STEM subject leaders (62.2%) teach mathematics. A majority of new teachers that were surveyed teaches a STEM subject (45.0%). Most SBMs, SSLs and new teachers teach at the lower secondary (S1-S3) level. Only a small minority (max. 35%, SBMs) teaches in upper secondary (S4-S6). 94.1% of SEOs indicate to have followed the CPD training programme on Educational Mentorship and Coaching.

When testing for differences between the baseline and school leadership samples in terms of personal characteristics, we only note a difference for school leaders' access to a laptop, with the school leadership group being more likely to have a laptop (p=0.02).

Characteristics of schools

Characteristics of the schools are described below in **Table 4. School characteristics.** Most baseline schools (48.3%) are combined lower and upper secondary schools closely followed by lower secondary only schools. A majority (69.9%) of the schools are government-aided schools. Most schools can be considered medium-sized, with 50% indicating to have between 15-29 teaching staff and 38% indicating that their school has between 250-749 students. Schools are relatively well off when it comes to sanitation, with 89.1% indicating that there are separate male and female latrines at their school. In contrast, only 60.9% reports an adequate water supply at their school and 79.7% reports to have electricity at their school.

Looking at the difference between baseline schools and schools where school leaders have started the school leadership CPD programme, we note significant differences in access to adequate sanitation at school, with the school leadership group being more likely to have access to separate sex latrines (p=0.002). In addition, the school leadership group was more likely to compose of senior secondary schools (p=0.03). Both these indicators may point to the group of school leadership schools being slightly better off in terms of facilities than the baseline schools.

Table 4. School characteristics

School characteristics	Baseline schools (N=95)	School leadership schools (N=152)	P-value[1]	All schools (N=247)
School location			0.81	
City	14.1%	15.2%		14.8%
Rural	85.9%	84.8%		85.2%
Type of school			0.03	
Lower secondary	47.3%	44.2%		45.3%
Upper secondary	4.4%	14.7%		11.0%
Combined	48.3%	41.1%		43.7%
School status			0.60	
Government-aided	69.9%	71.3%		70.7%
Public	27.7%	23.2%		24.6%
Private	3.3%	5.5%		4.7%
School size			0.45	
< 250	5.4%	6.1%		5.9%
250-749	37.0%	38.4%		37.9%
750-1249	20.7%	30.5%		27.0%
1250-1749	17.4%	13.4%		14.8%
1750-2249	10.9%	5.5%		7.4%
2250-2749	6.5%	4.3%		5.1%
> 2250	2.2%	1.8%		2.0%
Number of teaching staff				
< 15			0.61	
15-29	17.1%	16.3%		16.8%
30-44	52.4%	45.7%		50.0%
>44	25.0%	32.6%		27.7%
	5.5%	5.4%		5.5%
Access to sanitation			0.002	
Yes, separate sex latrines	81.5%	93.3%		89.1%
Yes, same sex latrines	3.3%	3.7%		3.5%
No	15.2%	3.0%		7.4%
Access to regular electricity			0.16	
Yes	75.0%	82.3%		79.7%
No	25.0%	17.7%		20.3%
Access to adequate water supply			0.17	
Yes	55.4%	64.0%		60.9%
No	44.6%	36.0%		39.1%

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1   Calculated with a Chi-square test for categorical variables

Characteristics of in-depth interview and focus group discussion participants

A total of 67 in-depth interviews were conducted at 14 different schools. This included N=13 interviews with SEOs, N=14 interviews with school leaders (either a headteacher or deputy headteacher), N=12 interviews with SBMs and N=14 interviews with STEM SSLs. In addition, N=14 FGDs were conducted with STEM pupils. The number of respondents in the FGDs ranged from 6 to 10 participants.

An overview of the characteristics of selected schools for the qualitative research can be found below in **Table 5. Characteristics of schools selected for the qualitative research.** Like the quantitative sample, most schools are government aided. Most schools offer 9 years basic education (primary and lower secondary). 15% of the interviewed headteachers is female which is slightly less than the percentage of females among the surveyed school leaders (22%).

Table 5. Characteristics of schools selected for the qualitative research

Characteristic	Schools (N=14)

Type of school
    Secondary only
    9 years basic education
    12 years basic education
    Primary and secondary
	
	22%
	45%
	32%
	2%

School status
    Government-aided
    Public
    Private
	
	67%
	24%
	9%

Gender of headteacher % female	 15%

Baseline status of CPD support system for education actors

Professional Learning Communities of Headteachers

Professional Learning Communities (PLCs) of headteachers is one of the school leadership CPD support interventions of the LTLT programme. By the end of the programme, it is expected that all involved sectors have initiated and sustained quarterly PLC sessions for headteachers.

According to the SEO survey findings, 94.1% of the SEOs indicate that they have facilitated a PLC for headteachers. In the past 12 months, the majority indicates that this happened on a termly basis (67.7%) and that the PLC sessions were very useful (69.6%). School leaders' reports of PLCs indicates that 74.7% took part in a PLC session.

In-depth interviews with school leaders confirm that PLCs have been useful for school leaders as is illustrated by the following quote:

"Yes, during those professional development meetings we do share experience and from those experience I learn from others. I learn many things which help me to improve my daily work."
School leader, 10 years of experience

When comparing the group of SEOs that have followed the CPD training programme (94.1%) to the group that has not followed the training programme, the training programme is related to whether the SEO facilitates PLC sessions. In the group that has taken part in the training programme (N=127), 98.4% indicates that they facilitated a PLC session. In the group that has not taken part in the training programme (N=8), only 25% indicates that they facilitated a PLC session (p<0.001).

Continuous professional development for school staff

Through the provision of a certificate training on educational coaching and mentoring for SBMs and SSLs, the LTLT programme aims to place CPD for all teachers high on the school agenda. By the end of the programme, all involved schools should provide formal, non-formal and informal needs-based CPD for all teachers.

The surveys with school leaders, SBMs, SSLs and new teachers show that current access to formal professional development activities depends largely on your position within the school. For instance, the baseline group of school leaders report to receive trainings from external parties such as Rwanda Education Board (REB) and NGOs on a regular basis (e.g. 43% reports to receive termly trainings by REB in the past 12 months). SBMs also receive quite some formal professional development with 26% reporting to receive termly trainings from REB in the past 12 months. In contrast, for SSLs and new teachers, access to formal professional development activities is limited. For instance, 52% of the SSLs and 69% of the new teachers indicate to never have received trainings from REB in the past 12 months.

Figure 6. Participation in trainings/conferences organised by REB the past 12 months
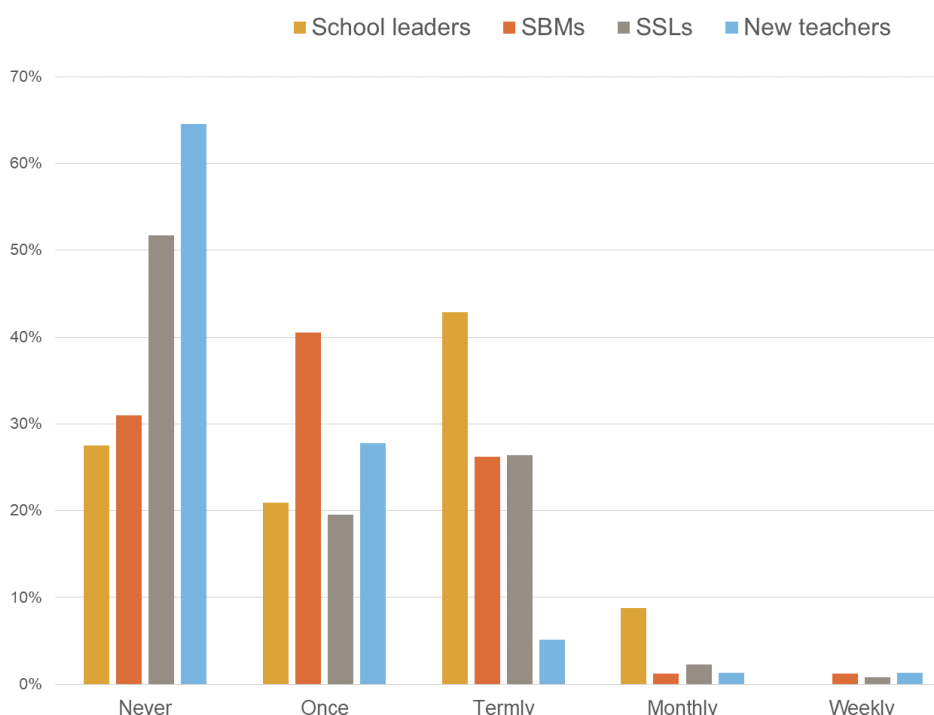
When looking at CPD activities related specifically to pedagogy and teaching quality, there are again quite some discrepancies between SBMs on the one hand and new teachers on the other hand. As can be seen in **Figure 7. CPD frequency according to SBM and new teacher**, SBMs indicate to take part in CPD on teaching pedagogy and content knowledge mostly on a termly basis and in CPD on behaviour and class management mostly on a weekly basis. Most new teachers on the other hand report to never take part in such CPD activities. When disaggregating findings by the number of years the new teacher has been working at the school (less than 1 year versus 1 year or more), we do note that there is an improvement in exposure to such training. However, even among those new teachers that have been at a school one year or longer, a significant number still indicates to have never followed a training on for instance behaviour and class management (46.6%).

Figure 7. CPD frequency according to SBM and new teacher
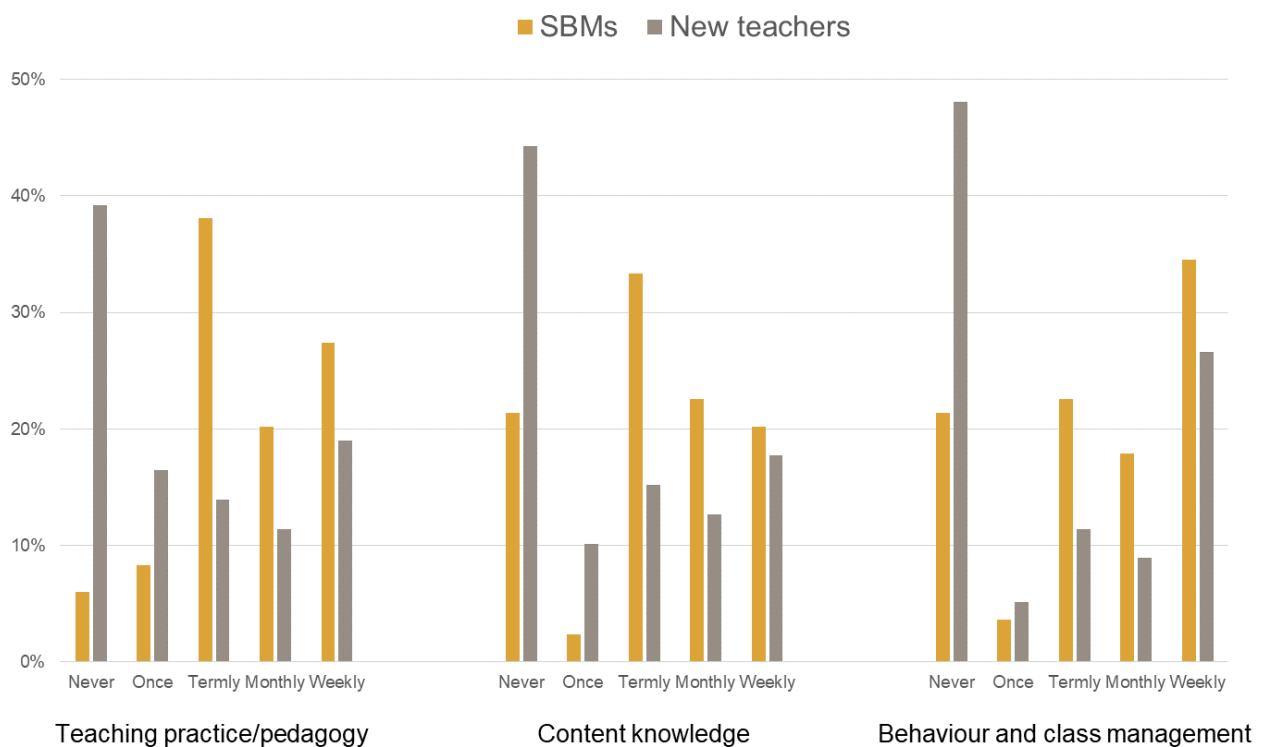
In-depth interviews with school leaders, teachers, SBMs and SSLs, show that CPD activities do take place at most schools. In most cases, CPD seems to be organised through formal timetabled meetings, where staff members from a department or from different departments gather to discuss a case study. According to the interviews, CPD seems to be knowledge focused, values and attitudes of teachers are not discussed:

"During CPD we do focus on knowledge but don't have time to analyse the behaviour"
SBM with 6 years of experience as SBM

There is some mention of informal coaching and mentoring sessions taking place and some of the new teachers interviewed indicate that there is a focal point at their school that they can approach when they face an issue or want to discuss their CPD:

"When there is a teacher with a special problem, he/she approaches a mentor or SBT or even school administrator, as we are together in those groups of learning." New teacher, interview 14

There seem to be large variations between participating schools in how CPD is implemented. Some schools have timetabled CPD through bi-weekly, weekly, monthly or quarterly staff meetings while at other schools there are no timetabled CPD meetings and CPD activities are either not conducted at all or in a very adhoc manner.

In general, it appears that there is very little room for personalised needs-based CPD as most of the CPD conducted takes place in groups through formal meetings. As indicated by many of the SBMs and SSLs, the amount of time available for CPD is very limited due to their teaching tasks which also limits their possibilities with regards to the types of CPD activities that can be implemented. When it comes to external trainings, Competence-Based Curriculum (CBC) training at sector level are mentioned the most regularly. In most cases respondents indicate that CBC trainings have been conducted a long time ago and that a refresher training is desired. In addition, SSLs frequently indicate that the trainings provided at sector level are very general and that they miss specific trainings on science and mathematics:

"There is no specific professional development for mathematics and sciences teachers from our school, these teachers receive professional development like others, and this is done by department. There is no specific support or activities for them. I remember that the last trainings that I had on sciences and mathematics was in 2008 and it was about the new curriculum, and in this school, I am only the one who have been trained, no one else"
SSL interview 9, 5 years HoD

Professional networks

During the in-depth interviews, SEOs, school leaders, SBMs, SSLs and new teachers were asked who they network with for professional development so that their social networks could be visualized (**see figures 8-12**).

The social network analysis shows that school leaders and SBMs report the broadest professional networks. For school leaders, common stakeholder categories included in the network are SEOs, teachers, other school staff, parents, students, other headteachers, District Education Officers (DEOs) and partners. SBMs reported a broad network within the school but also outside the school. This network consisted of teachers, SEOs, CPD coordinators, parents, students, REB, STEM SSLs and partners. The network of SEOs was broad for some but very narrow for others. Where the network was very broad, the stakeholder categories included HTs, SBMs, school staff, parents, students, executive secretaries, partner organisations, governmental partners or officers, DEOs and District Directors of Education (DDEs). Where the network was very narrow, the only links included were with other SEOs.

STEM SSLs and new teachers reported the narrowest professional networks. Many SSLs only identified a small number of stakeholder categories; these were primarily teachers. New teachers reported the most insular personal networks, with few outward relationships with other stakeholder categories. In many cases, the teachers interviewed reported only having other teachers in their professional network indicating that teachers primarily rely on their peers for professional development and knowledge sharing.
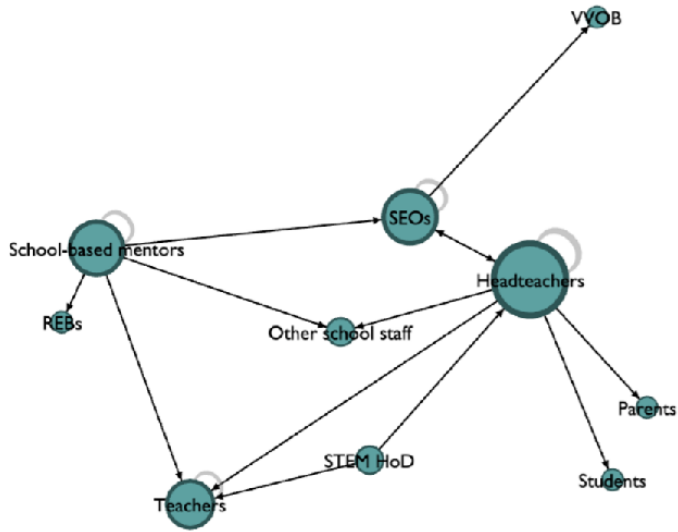
Figure 8. Professional network of SBMs

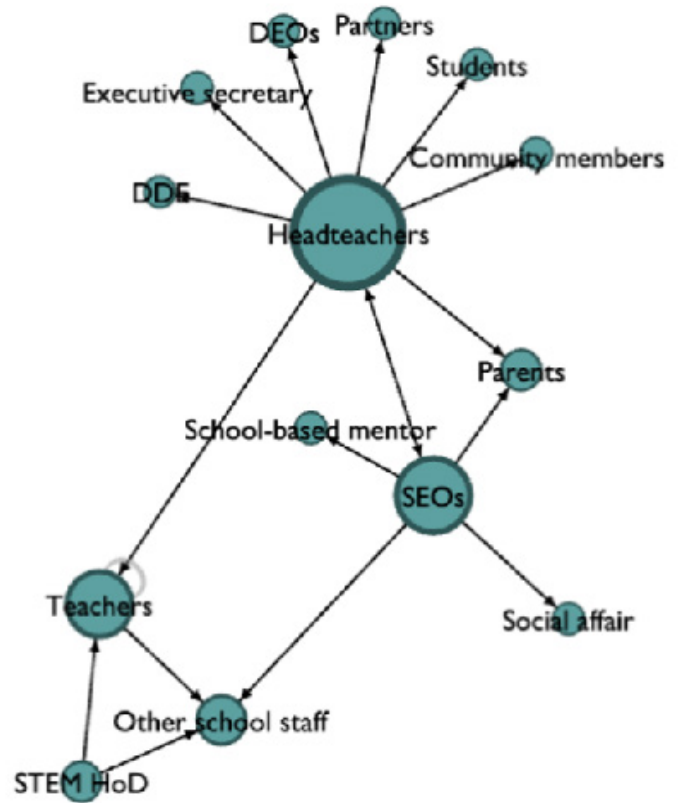**Figure 9. Professional network of School Leader**

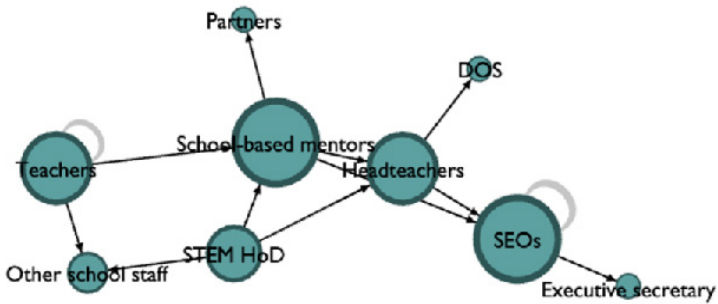**Figure 10. Professional network of STEM SSLs**
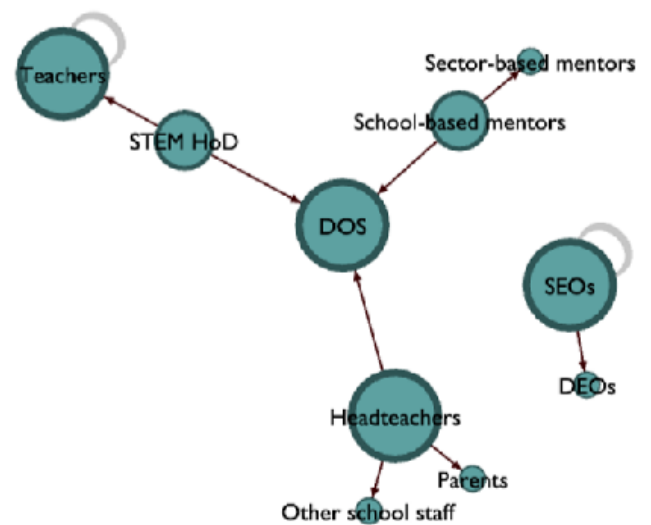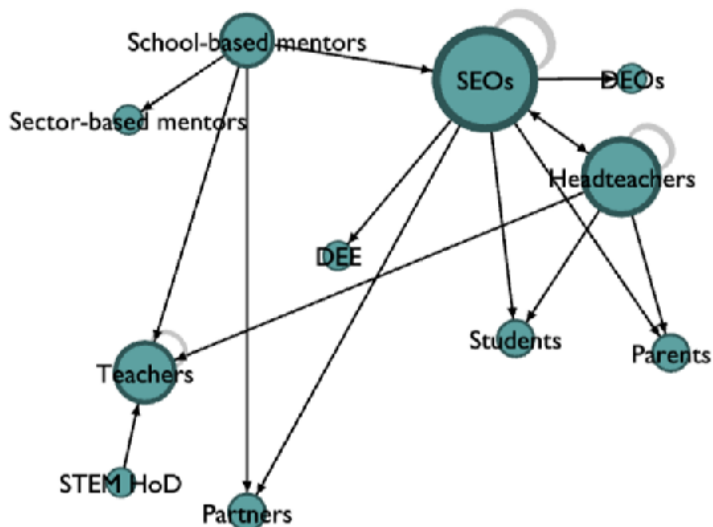

Figure 11. Professional network of SEOs

Figure 12. Professional network of teachers

Induction programmes and Communities of Practice for new teachers

Literature indicates that teachers considerably improve performance over the first three to five years (Glewwe, Hanushek, Humpage, & Ravina, 2011; Hanushek & Rivkin, 2010; Rockoff, 2004, 2012). However, in these first critical years in-service, new teachers are also more likely to leave the profession early. Motivation plays a key role in determining whether new teachers leave the teaching profession or not (Strong, 2005). Within the LTLT programme, Communities of Practice (CoPs) and induction programmes for new teachers are thus part of school-wide strategy on teacher professional development and teacher collaboration. By the end of the programme, all involved schools should have organized CoPs and formal induction programme for new teachers need to be in place.

According to surveys with school leaders, 53.7% of school leaders indicate that there is currently a **formal induction programme for new teachers**. The induction programme is mostly for both newly qualified and newly assigned teachers (90.9%) and is mostly delivered by SSLs/heads of department (68.2%). The median number of days for such an induction programme is 10 days. School leader findings are confirmed by SSLs, whereby 53.3% indicates that there is an induction programme for new teachers.

When it comes to **taking part in CoPs**, only 37% of the new teachers said that they took part in a CoP the last 12 months. When disaggregating results by how long the new teacher has been working at the school (less than one year at the school versus one year or more) we find no statistical differences between the two groups, meaning that working at the school a year or longer did not impact taking part in a CoP.

According to in-depth interviews with new teachers, much of the support provided to new teachers is instrumental, i.e. handing them pedagogical documents and teaching aids and giving them a general introduction to the school:

> *"The new teacher is explained about teaching profession, after, she/he is guided on how to prepare pedagogical documents and shared the timetable for her/his lessons." New teacher, interview 10*

When it comes to CPD, quite a few new teachers indicate that they receive the same CPD activities as other teachers at their school:

> *"In terms of CPD, new teachers are given opportunity to participate in different activities with others teachers where he can learn from others' experiences but there is no specific séance for us as new teachers." New teacher, interview 9*

In contrast to what would be expected, lesson observations are hardly mentioned by any of the new teachers. In fact, only one new teacher mentioned such a lesson observation:

> *"The school administrators visit us in class, they assess the way we teach, where they find a gap, they help us to make corrections. We are visited by headteacher or director of studies. I have been visited once in whole the year; which is how often other teachers are visited, not like a new teacher." New teacher, interview 5*

SEOs were asked whether they observed any variation across schools in the delivery of induction programmes. Most SEOs did indicate that there was variation and that this mostly depended on leadership style and management as well as the attitudes and capabilities of headteachers to organise such support:

> *"This variation is based on headteachers' mindset and willingness to support and/or they don't have enough skills to provide support due to language barriers or not feeling confident about supporting others." New teacher, interview 3*

Conclusions and reflections on the CPD support system

Building a CPD support system is one of the major expected outcomes of the LTLT programme. Based on the findings of the baseline study we note that participation rates in PLCs are high, that school leaders are motivated to take part in such PLCs even without taking part in the diploma programme and that school leaders greatly value such networks. We also note that training SEOs helps to initiate such PLCs and may also be the main reason why participation rates in PLCs are so high. Moreover, trained SEOs are more likely to initiate PLCs and promote participation in PLCs.

When it comes to CPD for school staff, we note a discrepancy or inequality in the provision of CPD to different staff members. STEM teachers and new teachers were found to receive the least training. To this end, most new teachers said to never have received any training on pedagogy, content knowledge and behaviour and class management over the past 12 months. Literature shows that new teachers in particular need such training (Cabus, Haerlemans, Flink, Gasozi, &Peeraer, 2019). Hence, it is striking that exposure to such training is much lower among new teachers than among SBMs. Given that the LTLT programme targets new teachers indirectly through the school leaders, SBMs and STEM SSLs, we expect the programme to enhance exposure to such training. Another important finding is that interviewed STEM SSLs complain about the lack of subject specific training provided to them and that quantitative findings further show that this group also receives little to no formal training. The government of Rwanda has placed a high priority on improving the quality of STEM teaching (UNU-IAS, 2006) and the expectation was that STEM SSLs would already be receiving regular training on STEM content. The STEM SSLs in our sample did not feel that their training needs were met yet, and work remains to be done to improve this.

We also studied whether induction programmes were available for new teachers. In contrast to our expectations, we note that more than half of the schools have formal induction programmes for new teachers in place. Although it is positive that such large numbers of schools already have induction programmes, the in-depth interviews with new teachers reveal that the content of such programmes could be improved. Currently, the induction programmes are largely support-focused (i.e. familiarizing them with the work environment and addressing direct concerns) (UR-CE, VVOB & REB, 2018a). A more standard oriented induction (i.e. providing support to new teachers so that they can grow in their profession based on a shared understanding of teaching and learning) and attention for personal/emotional support (Stansbury, K. & Zimmerman, 2000) seems to be lacking.

Lastly, we looked at how regularly and frequently CoPs were organised. We note that only around 37% of the new teachers indicate that they took part in a CoP which is much lower than the participation rate in PLCs. An important explanation for this finding is the fact that among the baseline sample, none of the SBMs (the main drivers of CoPs) have been trained yet. In line with what we find for PLCs, once SBMs receive training it is likely that participation rates in CoPs will improve.

## Assessment of the competences/motivation of school actors

Competences of school leaders to effectively lead schools

International literature identifies effective leadership as a critical factor in raising the achievement of learners (Leithwood et al., 2008; Robinson, Lloyd, & Rowe, 2008). The LTLT programme thus supports school leaders in becoming effective leaders through the provision of a diploma programme in effective school leadership complemented with quarterly Professional Learning Communities (PLCs) at sector level. By the end of the LTLT programme, school leaders should be more competent in leading their schools.

Competence of school leaders to effectively lead their schools was primarily assessed through an adapted version of the Tschannen-Moran & Gareis (2004) headteacher efficacy scale. The scale consists of 38 items which were subdivided into subscales according to the Rwandan five standards of school leadership framework, namely: Creating strategic direction, leading teaching, leading learning, managing the school as an organisation and working with parents, other schools and the wider community. After deleting a few items to improve reliability, 5 sub-scales remain with moderate to good reliability: 1. Setting strategic direction (5 items, α=0.60), 2. Leading learning (4 items, α =0.69), 3. Leading teaching (8 items, α =0.77), Managing the school as an organisation (11 items, α =0.82). The last standard, community and parental involvement only contained two items and as such no reliability statistics were calculated.

As can also be seen in **Figure 13** below, the mean scores on the five standards of school leadership are medium to high for all standards. The mean score is lowest for leading teaching and highest for leading learning.

Figure 13. Mean scores (SD) on five standards of school leadership
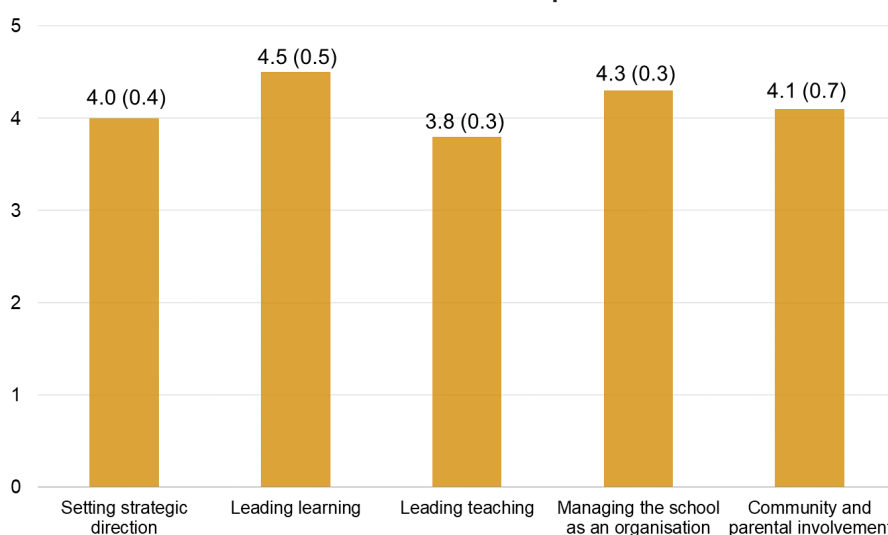
Note: the scaling goes from 1 to 5, where 1 indicates that headteachers strongly disagree with the statements about the standard and 5 that headteachers strongly agree.

To further assess what the overall competence is of school leaders on all five standards, we created a competence index score. For each standard a sum score on a scale of 0-100 was created. Hereafter, each sum score was divided into three categories according to Bloom's cut-off points (Bloom, 1956) (0-59%: low competence; 60-79%: sufficient competence; >=80%: high competence). School leaders were considered to have high competence when they had a score equal or above 80% on all five standards.

Using this overall competence index score paints quite a different picture as we note that at baseline only 32% of the school leaders actually score high across all five standards.

To triangulate the self-report of the school leaders with reports of other respondent sources, SBMs, SSLs and new teachers were asked to rate their school leader's ability to lead their schools. The scaling went from 1 (ineffective) to 5 (very effective). As can be seen in **Figure 14** below, almost all SBMs, SSLs and new teachers indicate that their school leader is either effective or very effective.

Figure 14. Rating of school leader's ability to lead the school effectively
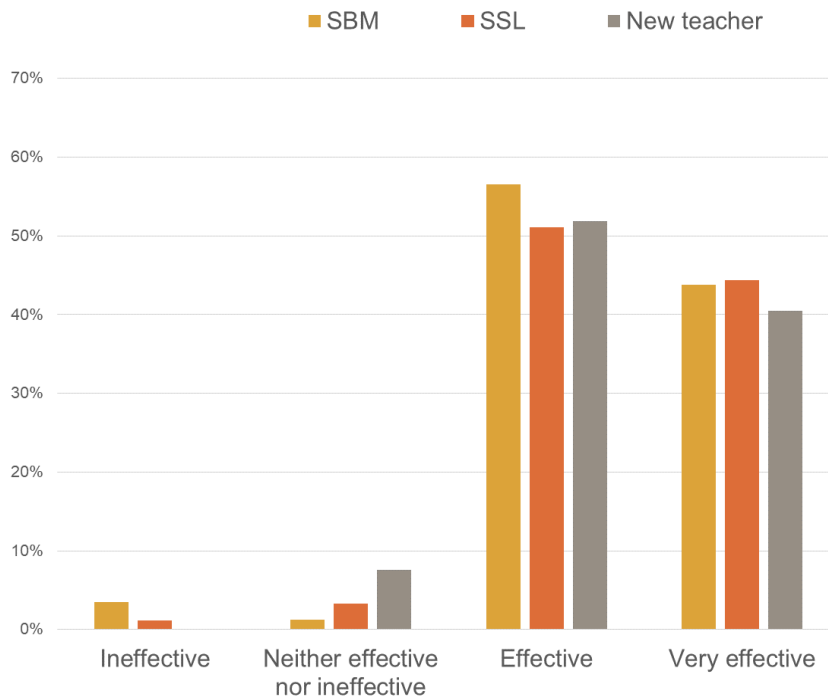
Lastly, in FGDs, students were asked how decisions were made at their school as well as the extent to which students or parents were involved in decision-making which is considered an important indicator of effective school leadership. Students indicated that some mechanisms were in place at their schools to stimulate student and parent participation. Students for instance mentioned school assemblies which act as forums to discuss issues. Students also indicated that there are student representatives which the school administration consults. However, according to them, this process did not reflect true student participation as it was unclear whether representatives were selected in a democratic manner and only student representatives (rather than the whole student population) were involved in making important decisions: "*Students are involved but only a few people are invited to meetings where important decisions are made*" (FGD 13). Students also commented that if they were invited to meetings, they were often less powerful in making decisions. A striking comment was that decision making by parents was often confined to the topic of finances: "*Parents are involved but this is mainly about concerned parents contributing some amount of money*" (FGD 7).

Competences of SEOs to coach and mentor headteachers in PLCs

Within the LTLT programme, SEOs are offered a certificate training in educational mentorship and coaching. Through this training, SEOs are equipped with the skills needed to effectively coach and mentor headteachers in Professional Learning Communities. By the end of the programme, SEOs should have improved their ability to coach and mentor headteachers through PLCs.

Since a great majority of SEOs were already trained during the time of the baseline study, trained SEOs were asked to self-rate their coaching skills before and after the CPD training programme. As can also be seen in **Figure 15,** a significant change (p<0.001) is observed in the self-rated mean scores of SEOs before versus after the CPD training programme.

Figure 15. Self-rated coaching skills of SEOs pre- and post-training
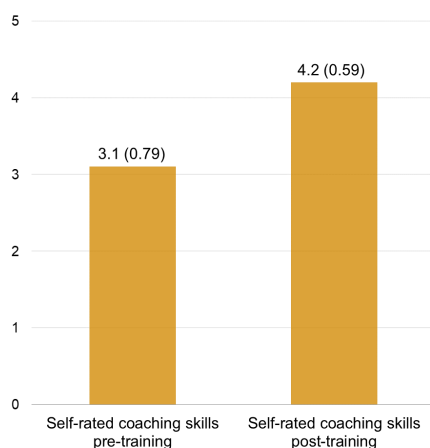
Note: a higher score indicates better self-rated coaching skills

In addition, SEOs were asked to rate their confidence in conducting various activities related to their role as a SEO, before and after the programme. The table below shows the mean scores (SDs) for these 10 items before and after the programme. As can be seen in **Table 6** below, on all 10 items, SEOs give themselves a higher score after than before the training programme. For all but two statements the difference is statistically significant (p<0.005).

Table 6. Mean scores (SDs) showing confidence of SEOs in conducting different activities pre- and post-training

Statement: To what extent do you feel confident doing the following?	Mean (SD) pre-training	Mean (SD) post-training	P-value[1]
Coaching and mentoring headteachers and deputy headteachers (in general)	3.2 (0.79)	4.2 (0.54)	<0.005
Guiding headteachers in strategies for teacher motivation	3.5 (0.80)	4.2 (0.55)	0.02
Guiding headteachers on approaches to teacher induction	3.1 (0.87)	4.1 (0.66)	<0.005
Guiding headteachers in leading schools and facilitating effective teaching and learning	3.5 (0.71)	4.2 (0.58)	0.009
Tailoring support for different headteachers and schools	3.1 (0.81)	3.9 (0.69)	<0.005
Managing student data	3.1 (0.93)	3.8 (0.73)	<0.005
Monitoring and evaluating the quality of education provision	3.5 (0.76)	4.1 (0.57)	<0.005
Leading meetings and delegating leadership of meetings to headteachers	3.4 (0.80)	4.0 (0.68)	<0.005
Facilitating headteachers in learning from one another	3.2 (0.90)	4.2 (0.54)	<0.005
Encouraging headteachers to assist in finding solutions for problems in the sector	3.3 (0.84)	4.1 (0.54)	<0.005

Note: a higher score indicates more confidence.

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1   Bonferroni correction applied: α/10. A difference is considered significant when p<0.005

Lastly, we assessed whether there was a change in overall confidence of the SEOs across all 10 statements. To do this we created a confidence index score. All 10 statements were summed, and the scale was transformed into a 0-100 scale. Hereafter, the scale was categorized into low confidence (0-59%), sufficient confidence (60-79%) and high confidence (>=80%) according to Bloom's cut-off points (Bloom, 1956). As can also be seen in **Figure 16** below, SEOs perceive a strong change in their confidence to coach and mentor school leaders before versus after the training programme.

Figure 16. Confidence of SEOs to coach and mentor school leaders before and after the training
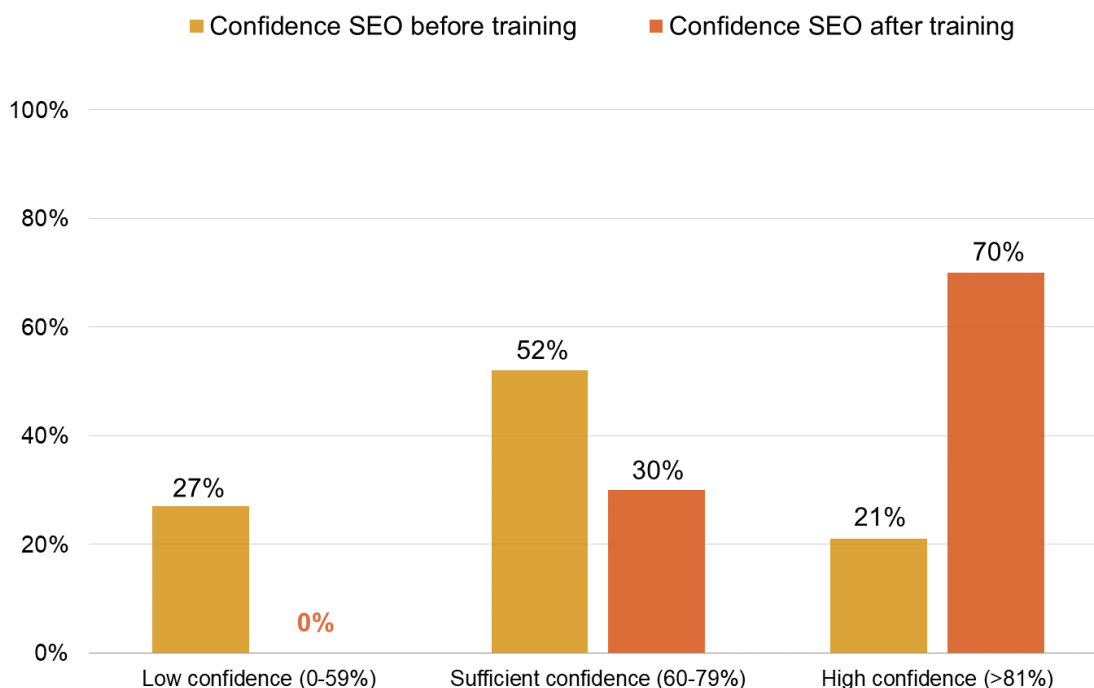
In-depth interviews with SEOs confirm that the CPD training programme has improved their coaching skills and has helped them to develop stronger professional development relationships with school leaders:

"Those skills helped me to establish a strong collaboration with headteachers. I am no longer considered as their superior but as their colleague with whom you can discuss and find solutions."
SEO, interview 12

Competences of SBMs and STEM SLLs to coach and mentor (new) teachers

Within the LTLT programme, SBMs and STEM SSLs are both offered a certificate programme in educational mentorship and coaching. For STEM SSLs module two of the training focuses entirely on teaching STEM. By the end of the programme, SBMs are expected to take the lead in guiding and organising CPD for all teachers and making sure that new teachers follow an induction programme. STEM SSLs are expected to mentor and coach (new) STEM teachers and take the lead in improving STEM teaching at their schools.

First, SBMs were asked about confidence in performing SBM tasks. In **Figure 17** mean scores (SDs) are provided for four different tasks. It is noteworthy that at baseline, most SBMs already indicate to be relatively confident about all four tasks and that this confidence is quite similar across the different tasks indicating that SBMs feel equally confident executing their different SBM tasks and roles.

Figure 17. Confidence of SBMs to perform SBM tasks
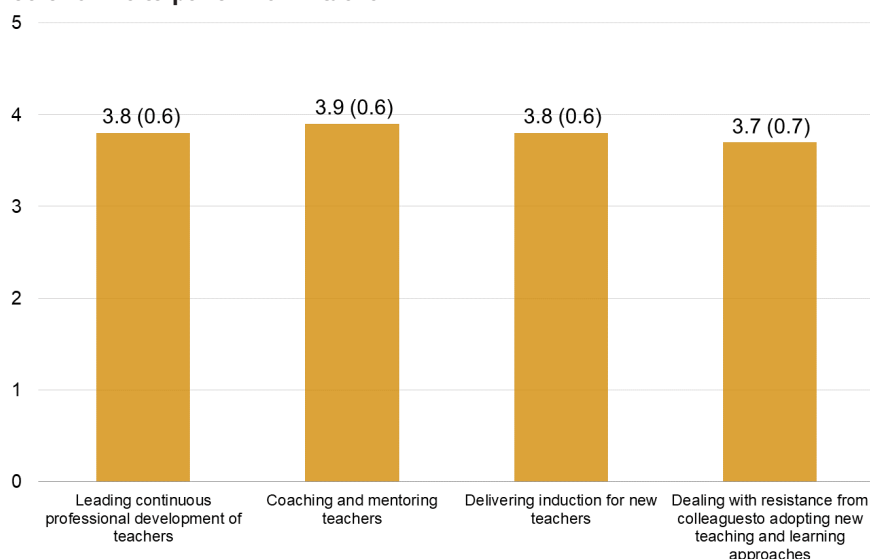
Note: a higher score indicates more confidence.

SBMs were also asked to rate their ability to perform various SBM tasks. **Figure 18** shows the mean scores for their self-rated ability. Similar scores are found for ability when comparing to confidence. However, a slightly lower score is seen for SBMs' ability to support teachers in dealing with challenges.

Figure 18. Ability of SBMs to perform SBM tasks
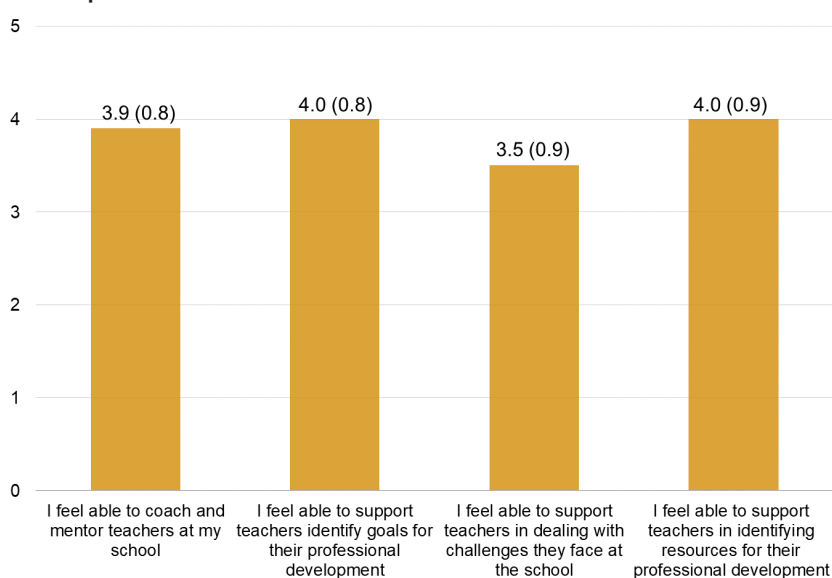
Note: a higher score indicates more ability

To gain a broader picture of the competences of SBMs, responses to the four statements on confidence and the four statements on ability were summed and transformed into a 0-100 scale. The scale was again re-categorized according to Bloom's cut-off points (Bloom, 1956) (low confidence: 0-59%; sufficient confidence: 60-79%; high confidence: >=80%).

As can also be seen in **Figure 19**, only 48% of the SBMs indicate to feel very confident about different SBM roles and tasks and slightly more (57%) indicate to feel very able to coach and mentor teachers. In general, this shows that not all SBMs feel able to coach and mentor their teachers yet and that there is room for improvement.

Figure 19. Confidence and ability of SBMs to coach and mentor teachers
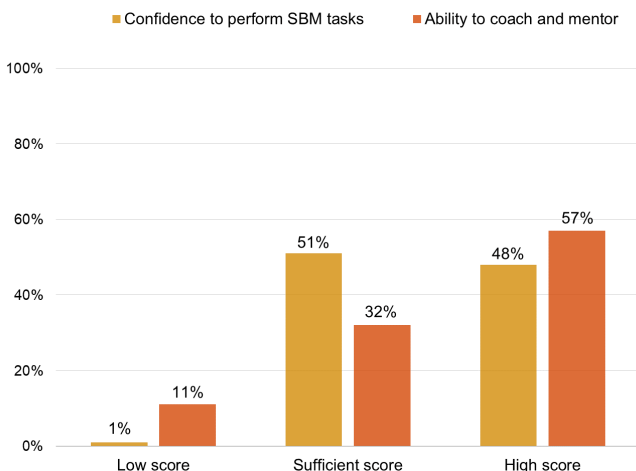
STEM SSLs were asked the same questions as SBMs but then specifically for STEM teachers. Figure 19. shows the mean scores (SD) for their level of confidence about performing different SSL tasks. Similar to what was found for SBMs, SSLs are already relatively confident about the four SSL tasks (**see Figure 20**).

Figure 20. Confidence of SSLs to perform SSL tasks
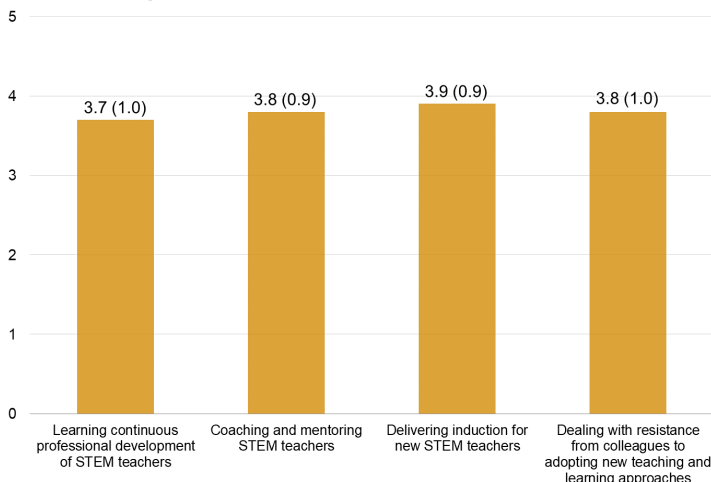
Note: a higher score indicates more confidence

Figure 21 shows the means scores (SD) on the ability of SSLs to perform various SSL tasks. Again, results are similar to SBM results. SSLs feel able to perform various SSL tasks however, they have more difficulty supporting STEM teachers in dealing with challenges.

Figure 21. Ability of SSLs to perform SSL tasks
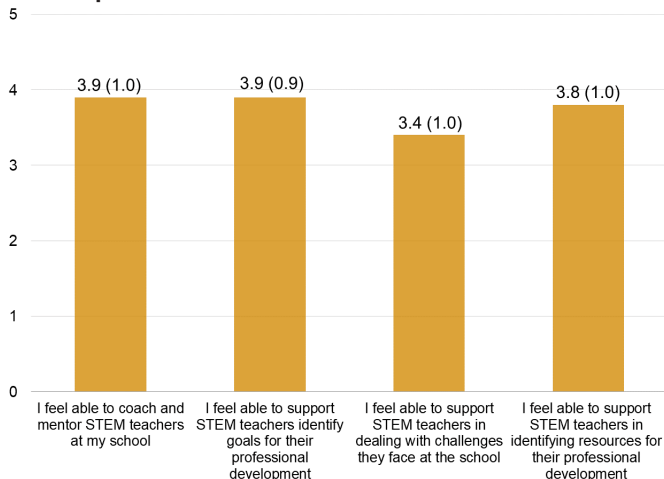
Note: a higher score indicates more ability

For SSLs, index scores for confidence and ability were also created to get a broader picture of their competences. The same approach as for the SBM scales was followed in calculating index scores and cut-off points. As can also be seen in **Figure 22** below, only 53% of the SSLs feel very confident to perform their SSL tasks and 58% feels very able to perform different SSL tasks. This also shows that quite a few SSLs still require support to feel more confident and able in their roles as SSLs all-round.

Figure 22. Confidence and ability of SSLs to coach and mentor teachers
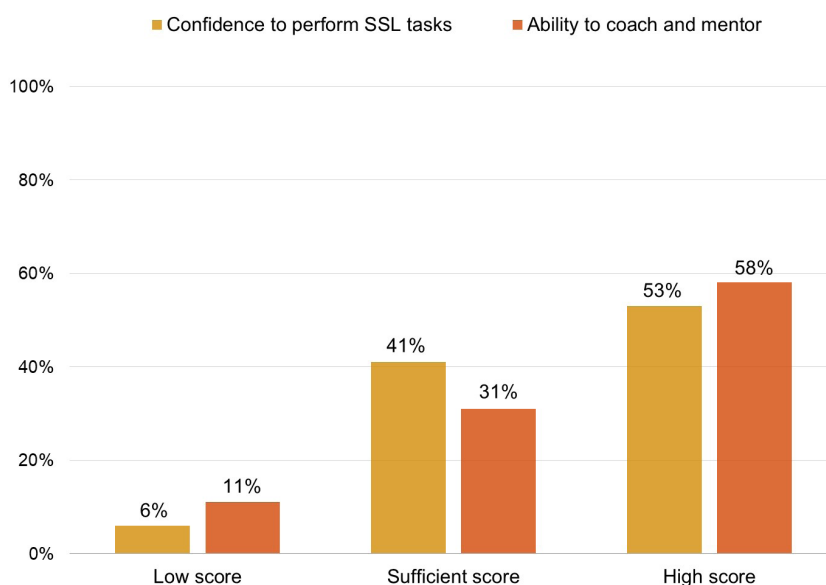
Teacher motivation

By offering more CPD to teachers at school level as well as formal induction programmes for new teachers, it is assumed that the motivation of (new) teachers will improve. Increased motivation in turn is expected to, on the long run, improve teacher absenteeism and attrition (Cabus, Haerlemans, Flink, Gasozi, & Peeraer, 2019).

To understand the baseline levels of teacher motivation at the participating schools, new teachers were asked about their motivation to teach through surveys and in-depth interviews. In the new teacher survey, two scales were included to measure teacher motivation. First, the Work-Related Basic Need Satisfaction scale (W-RBNS) was included to measure employee need satisfaction in three domains: need for competence, need for relatedness and need for autonomy (Van den Broeck et al., 2010). According to the self-determination theory all three aspects play a role in determining motivation and satisfaction at work. The version of the W-RBNS scale included in the new teacher survey included 18 items scored on a five-point likert scale, from strongly disagree to strongly agree. A reliability analysis shows that the overall reliability for the scale is sufficient (α =0.70). For the three subscales, reliability ranges from low (subscale competence: α =0.58; subscale autonomy α =0.45) to sufficient (subscale relatedness: α =0.68). Given the low reliability of two of the subscales, only the overall scale and the relatedness subscale will be used to describe teacher motivation.

Another scale which was included in the new teacher survey was the Work Role Motivation scale for teachers (Fernet et al., 2008). This scale looks at how motivated teachers are to conduct various tasks that are specific to the teaching profession. In the scale that was used, three specific teaching tasks were studied:

1. Teaching and instructing;
2. Lesson preparation;
3. Administrative tasks.

For all tasks, a similar set of 10 questions was asked using a 7-point Likert scale. The scale was eventually divided into three subscales: intrinsic motivation (2 items), extrinsic motivation (6 items) and a-motivation (2 items). The reliability of the extrinsic motivation sub-scales ranged from sufficient (α =0.68 for subscales teaching and instructing and lesson preparation) to very good (α =0.79 for administrative tasks).

The mean scores for teacher motivation according to the **Work-Related Basic Need satisfaction scale** were high at baseline with a mean score (SD) of 4.2 (0.3) for the overall scale and 4.4 (0.4) for the need for relatedness scale.

As can also be seen in **Figure 23** below, mean scores for teacher motivation according to the Work Role Motivation scale were also high for both intrinsic and extrinsic motivation and across all three tasks. A-motivation is low for all tasks. When looking within each specific task, there is one difference which is noteworthy; for lesson preparation, extrinsic motivation is significantly higher than intrinsic motivation ($p<0.001$) indicating that teachers are more extrinsically than intrinsically motivated to do their lesson preparations. However, in general, there are no large differences between intrinsic and extrinsic motivation within a task, indicating that teachers are motivated by both intrinsic and extrinsic drivers.

Figure 23. Motivation of new teachers to conduct main teaching tasks
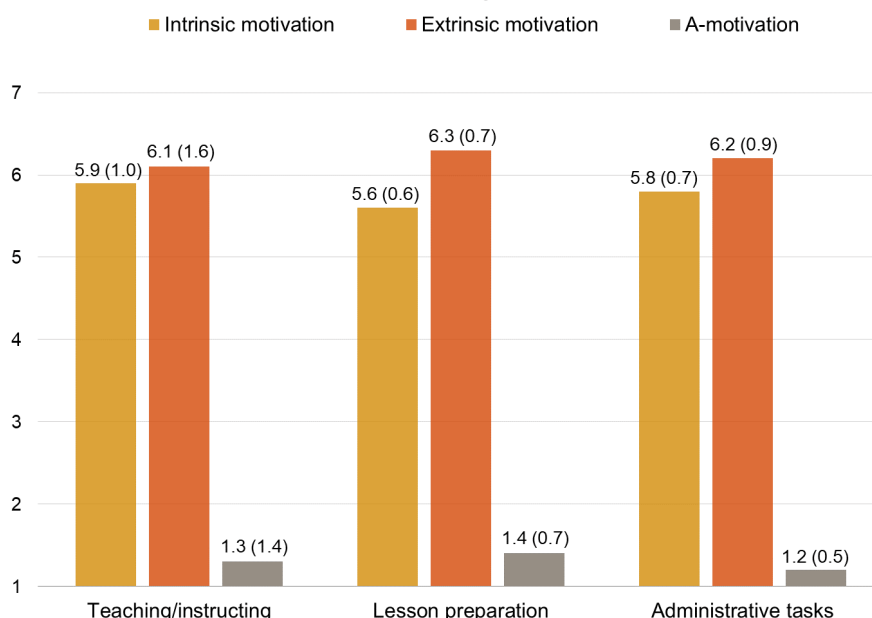
To further assess what the intrinsic motivation (an important determinant of teaching quality) is of new teachers across all three roles, we created an intrinsic motivation index score. For each teaching role an intrinsic motivation sum score was created and transformed into a scale of 0-100. Hereafter, each sum score was divided into three categories according to Bloom's cut-off points (Bloom, 1956) (0-59%: low intrinsic motivation; 60-79%: sufficient intrinsic motivation; >=80%: high intrinsic motivation). New teachers were considered to have high intrinsic motivation when they had a score equal or above 80% on three roles

According to the index score, 61% of the new teachers that were surveyed have high intrinsic motivation across all three roles. Though this is a relatively large proportion, it also means that 39% of the new teachers are not fully motivated to conduct all three roles.

To triangulate the findings, school leaders, SBMs and SSLs were asked to provide their views on four statements regarding the motivation of teachers at their schools. Questions were asked on a scale of 1 (strongly disagree) to 5 (strongly agree).

Table 7 below shows the mean scores (SDs) on all four questions. It is noteworthy that school leaders are the most optimistic about teacher motivation and retention and STEM SSLs are the least optimistic. STEM SSLs more often agree that teachers struggle balancing their workload and seem to be more worried about the school's ability to retain teachers. It should however be noted that STEM teachers were asked questions about STEM teachers in specific (instead of all teachers) which may explain the difference found. Nevertheless, it is of interest that motivation and retention among STEM teachers is perceived to be worse.

Table 7. Teacher motivation as reported by school leaders, SBMs and SSLs

Statement about teacher motivation	Mean score (SD) school leaders	Mean score (SD) SBMs	Mean score (SD) STEM SSLs[1]
Teachers at my school are respected by others in the community	4.2 (0.6)	3.9 (1.0)	3.8 (1.0)
Teachers at my school struggle balancing the workload	2.5 (1.2)	2.6 (1.1)	3.9 (1.0)
Teachers at my school are motivated in their job	4.2 (0.6)	4.6 (0.5)	4.5 (0.6)
I am worried about my (school's) ability to retain teachers	2.9 (1.4)	2.9 (1.3)	3.3 (1.3)

Lastly, new teachers were asked to indicate whether they had ever considered leaving the teaching profession. Findings show that although a great majority (73.5%) had never or rarely considered this, 21.6% has sometimes thought about this which can still be considered a relatively high percentage.

In-depth interviews with school leaders, SBMs, SSLs and new teachers confirm the overall finding that teachers are motivated but that there are factors that may negatively affect their motivation. The most important factors affecting teacher motivation were: financial benefits; a strong commitment to students; viewing teaching as a professional vocation; financial benefits (e.g. access to a school savings group); positive working relationships between school leaders and teachers; and access to in-school resources and training. Where interviewees indicated that the motivation was less this was often attributed to financial and practical hardship of the role:

"The school should motivate more teachers, even if our work is a vocation, but if we have some additional money from parents' contribution like an excellent school, we can be more motivated"
New teacher, interview 10

When probing further on demotivating factors, respondents also mentioned: lack of infrastructure/equipment, hunger, high student/teacher ratios, teaching in English instead of French and not being able to achieve professional goals.

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1   Note that for STEM SSLs the questions referred to STEM teachers

Conclusions and reflections on the competences/motivation of school actors

Within the LTLT programme the capacity of various school actors is built and consequently it is expected that the programme will have an impact on their competence to coach and mentor (SEOs, SBMs and STEM SSLs) and to lead their schools effectively (school leaders). In turn, improvements in the provision of CPD at school level are expected to improve teacher motivation.

The baseline findings on competence mostly show that though school actors are already on the right track, there is still some room for improvement when taking a closer look. School leaders gave themselves high scores for the application of the five standards of school leadership and new teachers, SBMs and SSLs also gave high ratings to their school leaders. However, when looking at how many school leaders have a high score on all five standards combined, this was only one third. Various studies indicate the importance of a holistic or systems-thinking approach in school leadership (Ahmad & Ghavifekr, 2014; Brauckmann & Pashiardis, 2011; Shaked & Schechter, 2016). Given the current findings, it will be of importance to divert more attention to the interrelatedness of the five standards in the diploma programme.

As a great majority of the SEOs had already completed the CPD training programme, this baseline study focused on perceived changes in coaching and mentoring skills of SEOs before and after the CPD training programme. According to SEOs, the training programme had a strong impact on their coaching and mentoring skills and 70% was found to have a high confidence score after the training programme versus 21% before the training programme. Whether these personal views are also shared by school leaders was not studied in this baseline research, but it will be essential to reflect on this throughout the implementation of the programme.

SBMs and STEM SSLs were also asked to rate their confidence and ability to conduct their roles and tasks. Looking at the baseline findings, we note that around half of the SBMs and STEM SSLs currently feel very confident to conduct their SBM/SSL roles and slightly more SBMs and SSLs feel able to conduct their roles. All in all, this shows that with around half not yet feeling very confident and able in their roles as SBM and SSL, there is still room for improving mentoring and coaching skills.

Lastly, we looked at the motivation of new teachers. In general, we note that a great majority of new teachers that took part in the surveys are motivated, and that intrinsic and extrinsic factors are equally driving their motivation. When looking at intrinsic motivation across the main three teaching roles (teaching, lesson preparation and administration) findings show that there is still a significant number of teachers that are not fully motivated; only 61% of the new teachers have a high intrinsic motivation across all three roles. Digging deeper into this, we note that one fifth of the new teachers sometimes consider leaving the profession and that especially among SSLs, who work closely with (new) STEM teachers, there are worries that teachers struggle with balancing the workload and that the school cannot retain teachers. Though at first sight new teachers seem very motivated, the data also makes clear that there is more to it than meets the eye and that there is still much work to be done to make sure new teachers are motivated and maybe more importantly remain motivated.

Intermediate effects of the school leadership diploma programme

As school leaders have a key role to play in improving the CPD support system, promoting continuous learning, increasing staff motivation and reducing teacher retention, it is of interest to study some of the intermediate effects of the school leadership programme. We focus on intermediate effects and not yet on long-term effects since the school leaders were only halfway the programme during the time of the baseline study. As such, the following intermediate/direct effects were studied:

a)   The participation of school leaders in PLCs;

b)   CPD support system for new teachers;

c)   The competence of school leaders to lead their schools effectively.

School leadership training and PLCs

The importance of taking part in PLCs is emphasized throughout the school leadership diploma programme. Hence, participation in the diploma programme may lead to a direct increase in participation in PLCs. Looking at the differences between the baseline group and the school leadership group, we currently note no differences between the school leaders that started the training and those that didn't in whether or not they participated in a PLC (25.3% indicates to never have participated in a PLC in the baseline sample vs. 28.8% in the school leadership sample).

School leadership training and CPD support system for new teachers

The importance of CPD for teachers and new teachers is strongly emphasized in the CPD diploma programme for school leaders. As such it is of interest to explore whether any differences can already be found in new teacher CPD when school leaders take part in the diploma programme. To study this, we test for differences between the two groups in delivery of trainings to new teachers on teaching practice, content knowledge and classroom and behaviour management. We also test whether CoPs for new teachers take place more frequently and whether formal induction programmes for new teachers are more often in place

As can be seen in the **Figure 24**, we note that more new teachers are exposed to at least a yearly training on teaching practice, content knowledge and classroom and behaviour management when the school leaders started their diploma course. When testing for significance, the differences are on the border of significance ($p=0.07$, $p=0.05$ and $p=0.05$ respectively) when considering all new teachers. When only considering the teachers that have been at the school a year or longer (N=172), the differences are significant for teaching practice and behaviour and class management ($p=0.03$ and $p=0.02$ respectively).

Figure 24. % new teachers that indicate to have at least a yearly training across the two groups
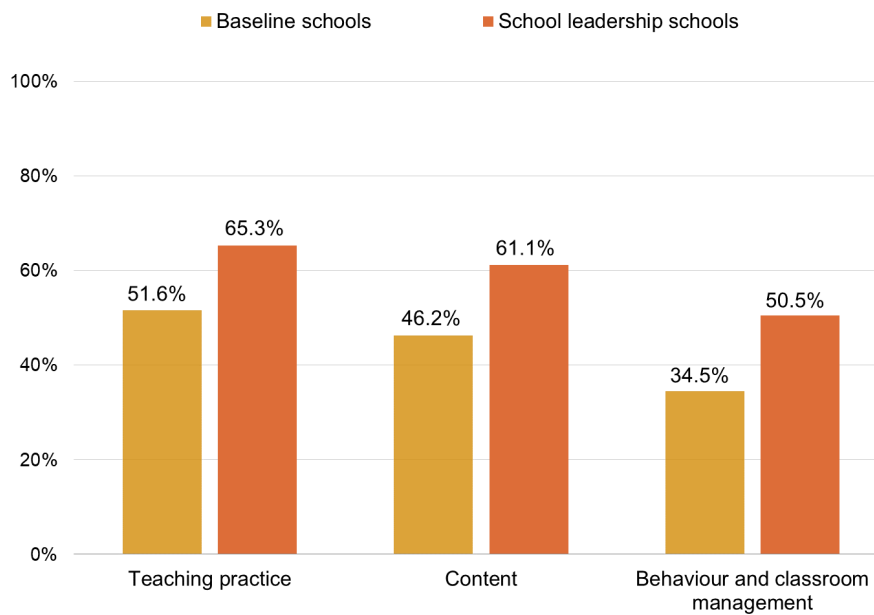
For the participation in CoPs the differences are very minimal (e.g. 41% indicating to have participated in a CoP in the school leadership group versus 37% in the baseline group). The school leadership group does do better than the baseline group when it comes to induction programmes for new teachers with 63% indicating that there is an induction programme available among the school leadership group versus 54% among the baseline group. The difference in availability of an induction programme is however not significant (p=0.35).

School leadership training and competence to lead schools effectively

Another intermediate/direct effect of the training programme may be observed at the level of school leader competence to lead their schools effectively. As such, we tested for differences between baseline and school leadership schools on the overall index score for self-reported competence on five standards. So far, there are no significant differences between the two groups (**see Figure 25 below**). The differences between baseline and school leadership schools were also tested for SBMs, SSLs and teacher ratings of the school leaders. For this variable, a significant difference is found for the new teacher rating (p=0.03): in the group of schools where the school leaders have been trained, new teachers more often rate their school leader as very effective (46.9% school leadership group vs 40.5% baseline group).

Figure 25. % school leaders with high self-reported competence on all 5 standards across two groups
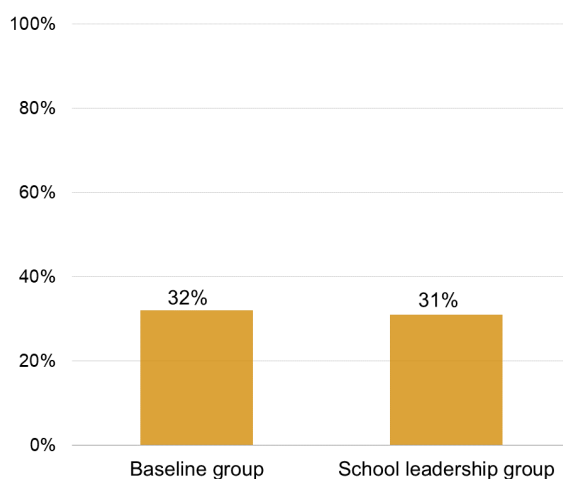
Conclusions and reflections on the intermediate effects of the school leadership training

This baseline study included two samples of schools: 1. Schools where there is no exposure yet to the LTLT programme (baseline schools) and 2. Schools where the school leader started his/her diploma programme (school leadership schools). By including these two groups, the intermediate effects of the school leadership diploma programme could already be studied in this baseline research.

Though the school leaders were only halfway their diploma programme, we already note a few positive changes. First, there is a positive impact on new teachers' exposure to training on content and behaviour and class management. Though we cannot ascertain that this is solely a result of the diploma programme, the strong emphasis on CPD for (new) teachers in the diploma programme surely contributes to this. Secondly, school leaders that started the diploma programme were more often rated as very effective by new teachers. Given that we also note an increase in exposure to training among new teachers, it could very well be that the more positive appraisal of their headteacher is linked to increased satisfaction with the work environment.

In contrast, we did not find any relationship yet between the school leadership diploma programme and the competence of school leaders to lead their schools effectively (measured through school leadership self-efficacy scale). Translating acquired knowledge and skills into practice takes time and seeing as the school leaders were only halfway the training programme (and had not covered the full content) it may be too soon to see an effect at this level. We were also unable to find any intermediate effects of the school leadership training programme on the participation of school leaders in PLCs nor on the participation of new teachers in CoPs.

With regards to PLCs, it should be noted that participation rates were already high for the baseline group. One likely explanation for the high participation rates could be because SEOs had already been trained during the baseline study and consequently SEOs started initiating PLCs. With regards to CoPs, we note that only a small percentage is taking part in sessions and that the participation of school leaders is not having much impact yet. It will become a priority during the next stage of the implementation to focus on getting the CoPs up and running and promoting participation in CoPs.

4. Overall conclusions and reflections

This report presented the baseline findings of an outcome evaluation of the Leading Teaching and Learning Together (LTLT) in secondary education programme which is implemented in 14 districts in Rwanda. This outcome evaluation, which was conducted by the VVOB M&E and research team in collaboration with The Research Base[1], aims to assess and measure the effectiveness of the LTLT interventions and to provide feedback to support continuous quality improvement.

In the baseline study of the outcome evaluation the following three research objectives were addressed:

1. To assess the baseline status of the CPD support system for SEOs, school leaders, SBMs, STEM SSLs and (new) teachers, looking specifically at the following interventions:
    *   PLCs for headteachers;
    *   CPD for school staff;
    *   Professional networks;
    *   Induction programmes and CoP for new teachers.

2. To assess the competences/motivation of key educational actors looking specifically at the following:
    *   School leaders' competence to effectively lead schools;
    *   SEOs' competence to coach and mentor headteachers through PLCs;
    *   SBMs' and SSLs' competence to coach and mentor teachers including STEM teachers;
    *   Intrinsic and extrinsic motivation of (new) teachers to conduct their main teaching roles.

3. To understand whether the participation of school leaders in the CPD diploma programme has any intermediate effects on:
    *   The participation of school leaders in PLCs;
    *   CPD support system for new teachers;
    *   The competence of school leaders to lead their schools effectively.

The following pages describe the overall conclusions and reflections that arise under each objective.

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1   The Research Base is a UK-based consultancy firm that was commissioned to provide technical advice in this baseline study.

Objective 1: Baseline status of the CPD support system for key education actors

CPD for teachers and headteachers is essential when it comes to improving the quality of education (Guskey, 2002b, 2002a). The LTLT programme thus aims to strengthen the competences of key education actors through improved CPD support systems.

One of the main CPD interventions for school leaders are PLCs. To this end, SEOs that take part in the LTLT programme are trained to facilitate PLCs and coach school leaders during PLC sessions. At baseline, **participation rates in PLCs were found to be high, school leaders were motivated to take part in such PLCs** even without taking part in the diploma programme and **school leaders greatly valued such networks**. It is of interest that the participation rates in PLCs are already high at baseline, since this indicates that the CPD training for SEOs (which almost all SEOs already completed during the baseline study) not only helps to initiate PLCs but also helps to ensure that as many school leaders as possible attend such PLCs. On its own this is already a great achievement.

Through the training of SBMs and SSLs in Educational Mentorship and Coaching, the LTLT programme aims to place CPD for all teachers high on the school agenda. Baseline findings on school based CPD show that CPD for teaching staff is still limited and that there is inequality in the provision of CPD. Some school actors (i.e. headteacher and SBM) have more access to CPD than others and report larger social networks. We also note that CPD is mostly organised through formal timetabled staff meetings and that personalised needs-based CPD is uncommon. At some schools, CPD never takes place or is organised in a very adhoc manner. A concerning finding is that especially new teachers and STEM school subject leaders have limited to no access to formal training. Based on previous research (i.e. new teachers being most in need when it comes to training on pedagogy, content and behaviour and classroom management (Strong, 2005)) and the Rwandan government's focus on improving STEM teaching (UNU-IAS, 2006), we had expected these two actors to be receiving the most training. Since SBMs and SSLs report to have limited time to organise and facilitate CPD activities, it could be that training received by the SBM are not always cascaded down to other staff members like the new teacher.

A little more than half of the school leaders that took part in this baseline indicated that an **induction programme for new teachers** was available at their school. It is positive that so many schools already have induction programmes as it will allow the LTLT programme to divert more attention to the content of induction programmes. Regarding the content, we found that the support provided within the current induction programmes is mostly instrumental i.e. introducing new teachers to the school and handing out pedagogical documents and teaching aids. A more standard oriented induction (i.e. providing support to new teachers so that they can grow in their profession based on a shared understanding of teaching and learning) and attention for personal/emotional support (Stansbury, K. & Zimmerman, 2000) seems to be lacking. To this end, new teachers also noted that many of the CPD activities that are organised are not any different from activities organised for experienced teachers.

When it comes to the **organisation of CoPs**, we note that only 37% of the new teachers took part in a CoP which is much lower than the participation rate in PLCs. One main factor contributing to this finding is that at the time of the baseline study, SBMs and SSLs were not trained yet. Since initiating and organising CoPs is an important part of the course content, it is expected that this will improve as more SBMs and SSLs complete the training.

Objective 2: Competences/motivation of school actors

Through the CPD support system, the capacity of various school actors is built and consequently it is expected that the programme will have an impact on their competence to coach and mentor (SEOs, SBMs and STEM SSLs) and to lead their schools effectively (school leaders). In turn, improvements in the provision of CPD at school level are expected to improve teacher motivation (Strong, 2005).

Baseline findings on **competences of school leaders to lead their schools effectively** show that although school leaders already give themselves high scores on the five standards of school leadership, only a few school leaders score high on all the five standards combined. On the other hand, almost all SBMs, SSLs and new teachers rate their headteacher as effective or very effective. Although school leaders are generally on the right track when it comes to the application of the five standards, it is important for the CPD diploma programme to place more emphasis on the inter-relatedness of the five standards. This is likely to help school leaders thrive even more in their roles and will help to achieve high competence on all five standards (Shaked & Schechter, 2016).

Baseline findings on **the competences of SEOs** show that after the training programme, strong improvements are perceived in the confidence of SEOs to coach and mentor school leaders. As indicated earlier, the training has also improved SEOs capacity to organise PLCs. Whether the training has also had an impact on the effectiveness of PLCs and coaching skills of SEOs as perceived by school leaders, is something which needs to be studied carefully during the midline and endline study.

The baseline study indicates that among a little more than half of the SBMs and SSLs, **competences of SBMs and STEM SSLs to coach and mentor (new) teachers are very high**. In general, this shows that the group of SBMs and SSLs is quite mixed when it comes to competence and that within the training sessions a personalised approach is crucial. For those that already feel very confident and able, empowering them to grow in their roles even more may suffice. For others, more guidance and support will be needed.

Lastly, the **motivation of new teachers** was assessed. We note that on the whole new teachers are motivated and that intrinsic and extrinsic factors are equally driving their motivation. On the other hand, one fifth of new teachers indicated to have sometimes considered leaving the teaching profession. SSLs further expressed their worries about the workload of STEM teachers and the ability of the school to retain them. In addition, when considering the three main teaching roles combined (teaching, lesson preparation and administration) only 61% of the new teachers had very high intrinsic motivation across all three roles. Many factors seem to be driving the motivation of new teachers and it will be essential to understand better how the decision to stay or leave the teaching profession is made and how the LTLT programme can contribute to this decision in a positive way.

Objective 3: Intermediate effects of the school leadership training programme

In this baseline study, we included 152 school leaders that were halfway in the training programme. As such, this provided an interesting opportunity to study whether the participation of school leaders in the school leadership training programme was already showing any intermediate effects.

We note that the **first positive effects of the programme** are already showing. First, there is a **positive impact of the school leadership training programme on new teachers' exposure to training** on content and behaviour and class management. Secondly, when school leaders started the diploma programme they were more often **rated as very effective by new teachers**. It is of interest that especially these two effects are found since it is plausible that they are related to one another. To this end, teacher rating of the headteacher may be a proxy measure for job satisfaction and more access to CPD has been associated with improved job satisfaction (Guskey, 2002b).

The participation of school leaders in the diploma programme did so far not have an impact on participation in PLCs, participation of new teachers in CoPs nor on competence of school leaders to lead their schools effectively. It should be noted that since school leaders were only halfway the programme, effects at the level of competence may take more time and should be studied in detail during the endline study. With regards to participation in PLCs, we note that it is likely that the SEOs in particular are the driving forces behind the organisation of PLCs and that building the capacity of SEOs particularly impacts the participation rates. On the other hand, it may also be too premature to see any effects of the diploma programme on participation in PLCs and as time goes by this may still increase. With regards to CoPs, we note that, similar to SEOs for PLCs, SBMs and SSLs in particular are the driving forces. Once the SBMs and the SSLs are trained on how to organise and guide CoPs it is likely that we will see an impact on participation rates.

5. Study strengths and limitations

Before we discuss the recommendations, it is of importance to consider the strengths and limitations of this baseline study. A major strength of this study is that the data that we report on can be considered representative for the schools that participate in the LTLT programme. Another strength is that we used both qualitative and quantitative data and triangulated respondent sources and data to draw conclusions. Lastly, this study included two groups of schools, which allowed us to already study the intermediate effects of the school leadership diploma programme.

One general limitation which has hampered the interpretation of some research findings is the high chance of socially desirable answers, especially when it comes to rating the effectiveness of school leaders and rating own competence. As a result, we observe ceiling effects for some scales. Such ceiling effects may eventually make it difficult to observe differences between the baseline and endline measurements. To address this issue, we created index scores which were categorized according to cut-off points. This approach helped to interpret findings better and remove the ceiling effects to some extent. A similar approach will also be used at endline to assess impact. Another limitation is that not all scales used were based on existing and previously validated scales and as such, it is unclear whether we were able to measure constructs in an effective manner. When comparing the group of school leadership schools to the group of baseline schools, conclusions should be drawn carefully as the school leaders were only halfway the training when the study was conducted. The effectiveness of the CPD diploma programme on school leadership can only be determined well at endline. Nevertheless, it is promising that some effects are already showing. Another limitation was that triangulation of respondent sources was challenging when similar constructs were measured using different sets of questions (e.g. standards of school leadership). Comparison of such measurements should be done with caution and the differences between the questions asked should be considered. Lastly, the Social Network Analysis was explorative in nature and was as such based on a very small sample of respondents. Generalizing these findings to the larger population should be avoided.

6. Programmatic recommendations

Based on this baseline study, several programmatic recommendations can be made which will help to optimize the implementation of the LTLT programmes. The following recommendations are identified:

» Though participation rates in PLCs are high, the effectiveness of the PLCs should be monitored throughout the programme by asking regular feedback from school leaders.

» Within all CPD training programmes and during programme field visits, the importance of equality

in the provision of CPD needs to be emphasized. Accountability mechanisms can be created at the level of schools and sectors (e.g. through PLCs) so that equality in the provision of CPD can be monitored regularly by both the SEO and the school leader. Special attention should be paid to whether training on pedagogy, content and classroom and behaviour management are cascaded down to new teachers and whether STEM SSLs receive enough training on pedagogical content knowledge.

» Timetabled CPD meetings should continue however, attention needs to be paid to ensuring this

does not go at the cost of organising personalised needs-based CPD.

» The LTLT programme through its collaboration with MINEDUC and REB should continue to

advocate for availing more time for the SBMs and SSLs to fulfil their tasks in a meaningful manner and to organise and facilitate needs-based CPD.

» Though efforts need to continue to make induction programmes available at all schools, at schools where induction programmes are already available, field visits could focus on the content of such induction programmes. In particular, more attention needs to go to ensuring that standard oriented induction programmes are offered and that such programmes are formalised and partly timetabled.

» Lessons learned from PLC implementation can be taken forward during the facilitation of course material on CoPs. Lessons can be learned on how to ensure high participation rates.

» Within the CPD diploma programme for school leaders the inter-relatedness of the standards of leadership should be made explicit and School Improvement Planning should include a holistic approach to school leadership.

» It should be acknowledged that trainees in all CPD programmes have different starting points and needs. It is essential for facilitators to take this into account during the different training sessions and during the field visits. Facilitators could consider to sample field visits based on starting points and needs (i.e. visit schools where trainees need more support).

» School leaders, SBMs and STEM SSLs appear to have different perceptions about the school environment, retention of teachers and workload in particular. It is of importance to understand more deeply what motivates new teachers to stay or leave the teaching profession and how the LTLT programme can contribute to this decision in a positive way.

7. Recommendations for the midline and endline measurement

As this was a baseline study, there are lessons that can be drawn up from this exercise which can be taken forward in the next two measurements. The following recommendations are identified:

» The qualitative instruments could complement the surveys even more by including more relevant questions (e.g. about the coaching skills of SBMs and SSLs) or conducting the qualitative study after preliminary quantitative findings are available so that it explore potential mechanisms that induce or hamper change.

» Some school stakeholders may be more knowledgeable about components of the programme than others and it may not be needed to ask similar questions across all respondent groups. As such, more thought needs to go into identifying the best proxy measures.

» In the endline study it is recommended to bring in more focus in the objectives of the evaluation as well as in measurement instruments, i.e. measuring less constructs.

» In the midline evaluation it is recommended to focus more on the process of implementing the programme (e.g. quality of training provided by the UR-CE) and the school leader and teacher support interventions. To understand the process better, it will also be interesting to conduct key informant interviews and staff interviews.

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Annex 1. Characteristics of survey participants (baseline sample)

Characteristics	School leaders N=92	School-based mentor N=85	School-subject leader STEM N=91	New teacher N=80	Sector Education Officer N=135
Mean age (SD)	41.3 (7.4)	35.4 (5.6)	33.9 (5.4)	30.9 (6.7)	41.8 (6.7)
% females	22.0%	12.9%	20.9%	30.4%	23.9%
Level of education					
A2 in education	0.0%	7.1%	5.5%	8.8%	0.0%
A1 in education (diploma)	4.3%	36.5%	33.0%	41.3%	0.0%
Bachelor of education (AO)	82.6%	51.8%	52.7%	48.8%	91.1%
Post-graduate diploma in education	5.4%	3.5%	8.8%	1.3%	0.7%
Master	7.6%	1.2%	0.0%	0.0%	8.1%
Other	0.0%	0.0%	0.0%	0.0%	0.0%
Mean years (SD) working in current role at the school (HT/DHT, SBM, SSL, SEO)	4.0 (3.6)	3.7 (2.0)	N.A.	N.A.	6.6 (2.3)
Mean years (SD) working as a head-teacher in total	8.2 (5.2)	N.A.	N.A.	N.A.	N.A.
Mean years (SD) working as a teacher at this school	N.A.	N.A.	N.A.	1.2 (1.0)	N.A.
Mean years (SD) working as a teacher	N.A.	7.4 (5.3)	7.8 (4.7)	4.0 (6.5)	7.0 (6.0)
Access to computer/laptop				N.A.	
Yes, at home and in school	49.0%*	21.2%	23.0%		78.8%
Yes, sharing with others	42.4%	54.1%	54.0%		15.9%
No	8.7%	24.7%	23.0%		5.3%
Access to internet				N.A.	
Yes, at home and in school	33.7%	23.5%	16.1%		76.5%
Yes, at my school only	30.4%	31.8%	32.2%		21.2%
Yes, at my home only	8.7%	44.7%	5.7%		0.8%
No	27.2%	0.0%	46.0%		1.5%

Characteristics	School leaders N=92	School-based mentor N=85	School-subject leader STEM N=91	New teacher N=80	Sector Education Officer N=135
In which grade do you teach?[1]	N.A.				N.A.
Primary 1		7.4%	0.0%	0.0%	
Primary 2		8.8%	0.0%	0.0%	
Primary 3		8.8%	0.0%	0.0%	
Primary 4		2.9%	0.0%	0.0%	
Primary 5		4.4%	0.0%	0.0%	
Primary 6		8.8%	0.0%	0.0%	
Secondary 1		61.2%	64.8%	74.7%	
Secondary 2		67.1%	81.3%	73.3%	
Secondary 3		75.3%	80.2%	69.9%	
Secondary 4		35.3%	30.8%	28.1%	
Secondary 5		32.9%	29.7%	27.4%	
Secondary 6		32.9%	28.6%	24.7%	
Which STEM subject do you teach?[1]	N.A.	N.A.			N.A.
Mathematics			62.2%		
Physics			37.8%		
Chemistry			28.9%		
Biology			27.8%		
Computer science			7.8%		
Which group of subjects do you teach? [1]	N.A.	N.A.	N.A.		N.A.
STEM				45.0%	
Humanities				16.3%	
Languages				36.3%	
Entrepreneurship				11.3%	
General studies and communication				15.0%	
Has SEO followed the Educational Mentorship and Coaching course?	N.A.	N.A.	N.A.	N.A.	
% yes					94.1%

Significant difference between baseline sample and school leadership sample calculated with a chi-square test for categorical variables and a t-test for continuous variables ***p<0.001; **p<0.01. *p<0.05

1 More than one answer could be selected