Education Analytics Service (EAS)

Teacher Development
Multi-Year Studies

Conceptual Framework

December 2017

Australian Aid

ACER

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Amendment History

Version No.	Date	Brief description of change	Author
1	19 October 2017	Initial Draft	Hilary Hollingsworth Elizabeth Cassity Debbie Wong Jacqueline Cheng
2	7 December 2017	Revised Draft following feedback from DFAT	Hilary Hollingsworth Elizabeth Cassity Debbie Wong Jacqueline Cheng

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1 Background

The Office of Development Effectiveness (ODE), in close consultation with DFAT's Education Section (EDC), have conducted a strategic evaluation of Australia's recent and current investments in teacher development. Research from the World Bank and others suggest teacher effectiveness is the most important factor for improving student learning outcomes. However, funding for teacher development is often a small proportion of investments in education.[1]

In December 2015, ODE published the *Investing in Teachers* evaluation report.[2] *Investing in Teachers* was informed by a literature review, interviews and desk reviews of 27 teacher development investments from 17 country programs. Two questions about the performance of DFAT's teacher development investments were asked in this evaluation:

Question 1.	Question 2.
What are the conditions of success for teacher professional development investments, and how can lessons learned inform future programming?	To what extent have Australian investments in professional development of teachers contributed to improved outcomes?

Investing in Teachers put forward findings on conditions of success for teacher professional development investments. These included that support for teacher development works best when negotiated within a government-owned and led education quality improvement agenda, and that successful investments have clear and realistic objectives.

However, *Investing in Teachers* could not evaluate the extent to which such Australian investments contributed to improved outcomes. There was "almost no data on outcomes that could be attributed to DFAT's teacher development investments" such that "in most cases it was impossible to judge whether teacher development had led to improved teaching practices or improved learning outcomes for pupils". Even when investments had outcome-orientated indicators, few teacher professional development investment program reports and reviews included data on these, and no programs had been rigorously evaluated.[3]

Based on findings of *Investing in Teachers*, three recommendations were made:

Recommendation 1.	Recommendation 2.	Recommendation 3.
DFAT should pursue systemic improvements to teacher management.	DFAT should carefully design teacher development investments.	DFAT should work systematically to improve its monitoring and evaluation of the outcomes of investments in teacher development.

This conceptual framework is part of DFAT's response to recommendation 3. In its management response DFAT committed to support multi-year studies of teacher development investments in at

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[1] DFAT 2015a, Investing in Teachers Briefing Note, p. 1.
[2] DFAT 2015b, Investing in Teachers.
[3] DFAT 2015a, Investing in Teachers Briefing Note, p. 4.

least two countries. To date, Timor-Leste, Vanuatu and Laos Posts have committed to undertake multi-year studies of their teacher development investments. Together, these multi-year studies are defined as 'the teacher development multi-year study series'.

DFAT, through EDC, has established the Education Analytics Service (EAS) to improve the extent and quality of evidence and expertise used to inform its education policy and programs. The EAS is managed by the Australian Council for Educational Research and Cardno Emerging Markets. EDC has commissioned EAS to manage the study series.

2   Purpose of the conceptual framework

Including three countries in the teacher development multi-year study series provides an opportunity to contribute to the thin empirical evidence in the Indo-Pacific region on outcomes from teacher development investments. However, it does present conceptual and operational challenges that require further consideration.

For example:

- Each DFAT education program has a different focus and modality, and is not at the same point in its program cycle. The program may be a focused teacher development investment or a sector-wide program. The availability and quality of data on outcomes varies and there is limited baseline data.

- 'On boarding' of Posts is staggered, with Timor-Leste most progressed, followed by Vanuatu, and Laos scheduled to start in early 2018. Additional country programs with relevant investments in teacher development are able to join the series provided they are on board in the early stages of the study series.

- If more countries join the study series, additional individuals will be engaged to undertake the country-level studies. For example, in Laos, a separate M&E facility will take the lead.

The design, implementation and overall management of the study series can benefit from an overarching conceptual framework that ties the studies together and streamlines operations by documenting purpose, lessons and approaches, and building in a level of technical and management oversight across the studies. While each standalone study will provide important evidence and findings about teaching and learning, there is an opportunity to maximise the learning potential within each and across the studies.

The purpose of this conceptual framework for DFAT's teacher development multi-year study series is to improve across the series:

- **Clarity** on the purpose of the series and what we want to know

- **Consistency** in terminology and methodology

- **Connections** to give us the ability to draw common conclusions and explain differences

- **Communication** to create a shared understanding of the series and each stakeholder's role and responsibility, and to use internal and external means to engage strategically and disseminate findings.

This conceptual framework also has the potential to inform future country and research teams wishing to adopt a similar approach.

3   Purpose of the study series

The study series has two purposes.

Firstly, to respond to recommendation 3 of *Investing in Teachers* (DFAT should work systematically to improve its monitoring and evaluation of the outcome of investments in teacher development).

Secondly, to provide an evidence-base to address the two *Investing in Teachers* report questions:

- To what extent have Australian investments in professional development of teachers contributed to improved outcomes?
- What are the conditions of success for teacher professional development investments, and how can lessons learned inform future programming?

An emphasis is placed on the former question in this study series, given *Investing in Teachers* could not report on this.

The findings of each country-level study will be of direct interest to stakeholders in each country and those involved in teacher development investment policy formulation and dialogue, and program improvement. Specifically, for:

- Ministries of Education, DFAT Posts and other in-country stakeholders:
  - ➢ how teachers and educational leaders implemented the education reform/intervention (e.g. new curriculum)
  - ➢ the extent to which the Australian intervention has supported improved teaching quality and/or student outcomes
  - ➢ how lessons learned from the approach in this country and other countries can inform the current program and future reforms, interventions and programming.
- DFAT EDC and ODE:
  - ➢ the extent to which Australian investment in teacher professional development has improved teaching quality and student outcomes
  - ➢ the conditions of success for teacher professional development investments across the Indo-Pacific region
  - ➢ how lessons learned can inform future teacher professional development investments
  - ➢ how the conduct of the study series can inform the design and implementation of future rigorous studies of teacher professional development investments
  - ➢ contribution to knowledge and good practice for DFAT and other development partners.

3.1   Scope and study questions

3.1.1   Type of teacher professional development

Teacher professional development – or professional learning – is a broad concept and can include a range of approaches. Australia's aid investments in teacher professional development typically involve one or a mix of the following types:

- Pre-service education and qualifications, for developing professional foundations of teaching and subject knowledge.

- In-service education such as:

    ➢ in-service qualification, often used to qualify large numbers of untrained teachers who need to acquire subject knowledge, understanding of child development and practical skills

    ➢ cohort professional development that is used to train (or retrain) teachers in new curriculum or pedagogical requirements, or to address specific practice challenges in a context

    ➢ school-based professional development, which can work well if principals are able and willing to lead teacher improvement, and if high quality technical support is available.

For the purposes of this study series, the focus will be on in-service teacher professional development approaches, whether or not they result in a qualification. In-service teacher professional development approaches respond to challenges identified in teaching and learning, and include opportunities for teachers to apply their new knowledge and practice immediately in the classroom.

Pre-service programs are excluded given the time lag experienced in some country contexts between teachers undertaking pre-service training and teaching in a classroom and additional complexities this poses to attribution.

3.1.2   Level of education

Australia's aid investments in education span from early childhood education to tertiary education. With the exception of scholarships, the majority of Australia's investments are in basic education with an emphasis on the early years. This is also the case in Timor-Leste, Vanuatu and Laos.

Of the additional countries that may take this approach, all have education programs with a focus on the early years. For comparability purposes, new studies should focus on the early years to the extent possible.

3.1.3   Key study questions

The key study questions in this series are to be informed by the two questions set out in *Investing in Teachers*. In line with question two, each study should respond to the following overarching question:

To what extent does this Australian investment produce improved teaching quality and improved student learning?

Specific questions related to this broad question that reflect each unique context can be investigated as part of each study. Their scope should be guided by the intended outcomes of the Australian investment. See Box 1 for an example.

> **Box 1: Study of Timor-Leste's Professional Learning and Mentoring Program (PLMP)**
>
> **Overarching question:** To what extent does this aid investment produce improved teaching quality and improved student learning?
>
> **Specific questions:**
>
> 1. To what extent does the PLMP support improved teaching quality in Timor-Leste?
>
> 2. To what extent does the PLMP support the effective implementation of Timor-Leste's National Basic Education Curriculum?
>
> 3. To what extent does teacher involvement in the PLMP lead to improved learning outcomes for Timor-Leste students?
>
> *Source:* Education Analytics Service 2017a, Study Plan for Timor-Leste's Professional Learning and Mentoring Program (PLMP), version 31 January 2017.

3.2   DFAT's priorities

In pursuit of teacher effectiveness and student learning, DFAT is concerned with equity, with a particular focus on gender equality and women's empowerment, and disability inclusion. These priorities are outlined in the following DFAT strategies:

- *Strategy for Australia's aid investments in education 2015-2020*

- *Gender equality and women's empowerment strategy*

- *Development for All 2015-2020: Strategy for strengthening disability-inclusive development.*

Each country-level study needs to reflect DFAT's priorities at each step – during the design of the study, data collection and reporting phases. This means that, where possible, new data collections will be disaggregated by gender and disability and the analysis should investigate whether the changes in teaching quality and/or student outcomes has varied with gender and disability status. Areas of interest include:

- support to children with disabilities in the classroom

- active participation of girls and boys in classroom learning

- female leadership.

Field work will also be undertaken with a social-inclusion lens, with the research team seeking the advice of gender and social inclusion advisers and/or disabled persons organisations.

3.3   ODE strategic evaluation

ODE will be conducting a follow-up to *Investing in Teachers*. The purpose of that follow-up will be to see to what extent DFAT has/has not improved its evidence-base for judging the quality and outcomes of investments in teacher development. It will analyse data from the study series and undertake additional interviews and/or field work to update findings.[4]

During the course of the series, ODE will negotiate details about the scope of this work with the IEC and the technical working group.

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[4] DFAT 2016a, ODE: Concept Note – Teacher Development: Phase 2, pp. 2-4.

4 Conceptual model

Figure 1 illustrates a conceptual model for the study of Australia's investments in teacher development.

The model depicts the flow of activity across four main components related to teacher professional development program investments: program participation, program design, teaching practice outcomes, and student learning outcomes. School outcomes and system-level outcomes are also represented as additional areas of interest, because although teachers, teaching and learning are the main foci of teacher development programs, school-level and system-level outcomes are also anticipated. All of the activity across the components is bounded by the contextual factors specific to the program and the program participants (see 'Context').

These contextual factors include culture, governance, policy, economy and social factors. Specific to teacher development, these factors can include teacher policy and funding for teacher training. This is particularly important because these contextual factors directly influence the potential success (impact) of each investment program.

Initial activity is associated with securing **commitment** from key stakeholders for the program design and for program **participation** (see 'Participation').

The teacher development investment programs comprise a series of **inputs or stimuli** and opportunities for teachers to engage in **classroom experimentation** related to program ideas. Program designs are informed by **principles** of effective professional development, and particular **resources and supports** are utilised in program implementation (see 'Teacher Development Investment Program (A)').

It is often the case that multiple teacher development programs are conducted in a country simultaneously, and it is anticipated that each of these will effect teachers, teaching and student learning. This is represented in the conceptual model through the inclusion of Programs (B) and (C) located in the diagram behind 'Teacher Development Investment Program (A)'.

The intent of teacher development investment programs is to improve **teaching practice** and in turn **student learning**. Teaching practice is shaped by a complex array of factors and each investment program will have particular aspects of teaching practice as foci. With respect to student learning, both cognitive and non-cognitive learning outcomes are of interest, and investment programs will have particular areas of student learning as foci.

It is anticipated that a customised version of this conceptual model will be prepared for the studies in each country. In each country model, details of the participants, teacher development program design and implementation, and anticipated teaching practice and student learning outcomes will be mapped. These will provide a conceptual frame for each study.
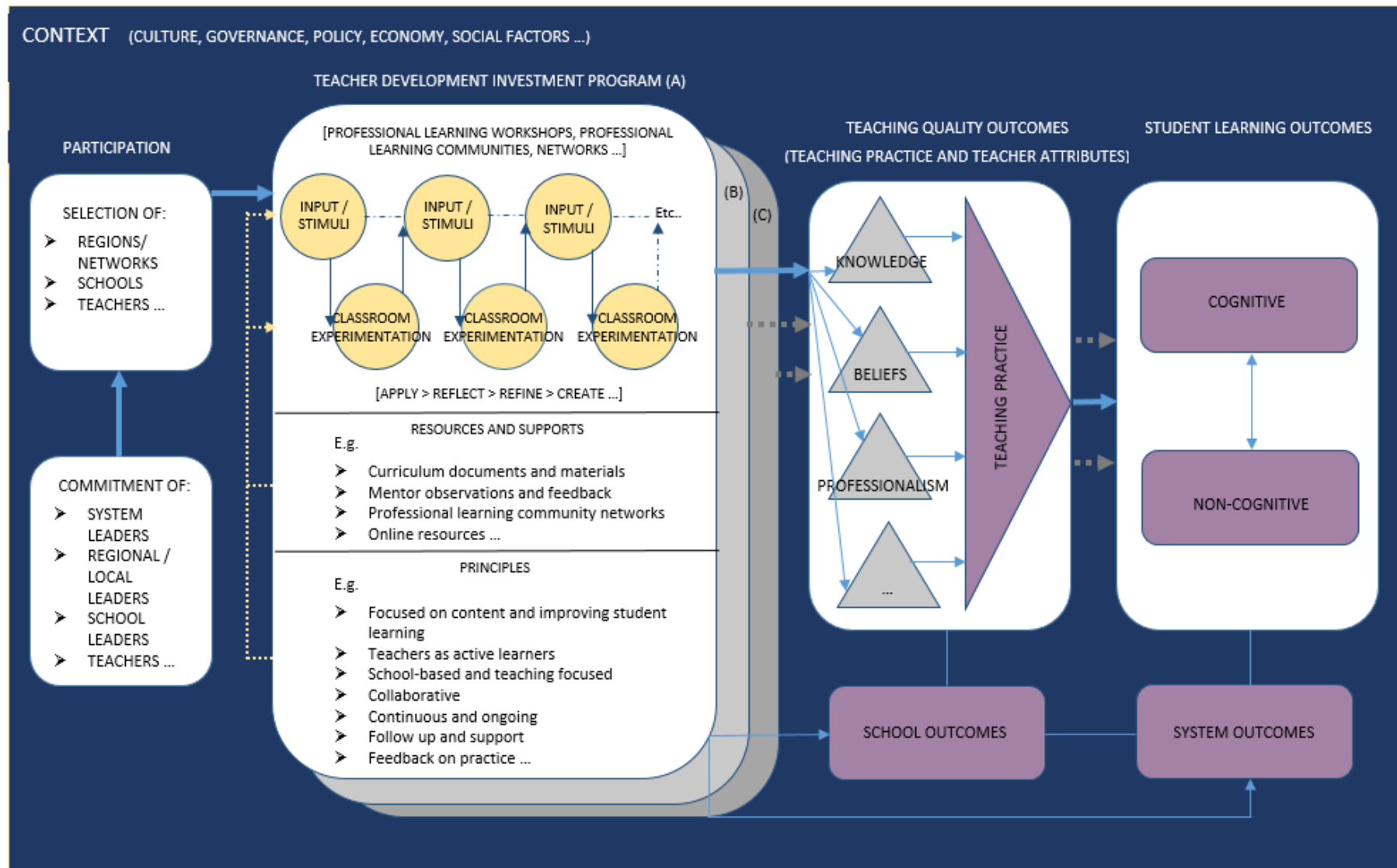
Figure 1: Conceptual model for the study of Australia's investments in teacher development

5 Terminology

Table 1 displays descriptions of the intended meaning of particular terms used within the study series. The descriptions are provided because the lexical terms associated with teacher professional development can have different meanings in different contexts. The terms are closely associated with those terms used in *Investing in teachers* (DFAT, 2015b).

Table 1: Terminology used in the study series

Terms	Descriptions
Teacher development	'Teacher development' is a broad concept that relates to teachers improving their professional knowledge, competence, skill and effectiveness. It is recognised that a range of contextual factors, (e.g. school policies, school environment, etc.) can contribute to the potential success of a teacher development program. The focus of this study series is on understanding the effectiveness of teacher development program investments in the participating countries.
Teacher professional development	'Teacher professional development' refers to the range of activities/programs that teachers participate in for their professional learning. In this study, there is a specific focus on teacher professional development that takes place in-service (i.e. during employment as a teacher) rather than pre-service (i.e. during initial teacher training). Some examples include: • in-service courses and workshops • cohort/network professional development • school-based professional development.
Outcomes	The second evaluation question in ODE's *Investing in teachers* refers to 'outcomes'. In this study series the main interest is in identifying and understanding the outcomes or effects of teacher development investments related to: • teaching quality • student learning. Additional areas of interest are outcomes related to: • teaching practice and teacher attributes • school effects • system effects. A description of each of these is provided in this table. In this series there is interest in both *intended* and *unanticipated* outcomes of teacher development investments.
Teaching quality	'Teaching quality' or quality teaching refers to effective instruction that promotes excellence and student learning outcomes through best-practices. Quality teaching practices are based on high standards of instruction and student engagement, deep understanding of content, and application of

	pedagogical principles that contribute to supporting and improving student learning.
Student learning (cognitive and non-cognitive)	'Student learning' is used broadly in this study series to encompass both cognitive and non-cognitive aspects of learning – in essence, what students know, what students believe, what students are disposed towards, and what students are able to do: • *cognitive* learning includes such things as the ability to understand complex ideas, the ability to adapt and learn from experience, the ability to reason, and mental abilities used in thinking activities such as reading, writing and numeracy • *non-cognitive* learning includes such things as personal traits, attitudes, motivation, and social and emotional skills.
Teaching practice	For the purpose of this series, 'Teaching practice' refers to teachers' application of their professional knowledge, beliefs, and attitudes to provide learning experiences for students. It includes what teachers do to plan, implement, and evaluate learning experiences, and ways that teachers incorporate principles of teaching and learning (e.g teacher-learner communications, feedback, respect, alignment with curriculum, alignment of assessment tools and strategies with learning outcomes, etc.)
Teacher attributes	For the purpose of this series, 'Teacher attributes' refer to elements of a teacher's professional identity including: • professional knowledge (including content, pedagogical, and pedagogical-content knowledge) • beliefs about teaching (including beliefs about content, pedagogy and learning) • attitudes about teaching (including confidence and motivation) • professionalism (including commitment and attendance).
School outcomes	In this study series 'School outcomes' refer to the effects that a teacher development initiative has at the school-level. Examples include: • improved school leadership capacity and motivation to support and improve teacher practice and student learning • improved relationships with parents and the local community encouraging stronger partnerships for student learning.
System outcomes	In this study series 'System outcomes' refer to the effects that a teacher development initiative has at the system-level. These effects might take place at the local, regional or national level. Examples include: • networks, clusters, or other enabling structures external to schools that facilitate peer learning and support for staff across schools • technical oversight and support from local/regional supervisors • program budgets to fund learning improvements across local/regional/national areas.

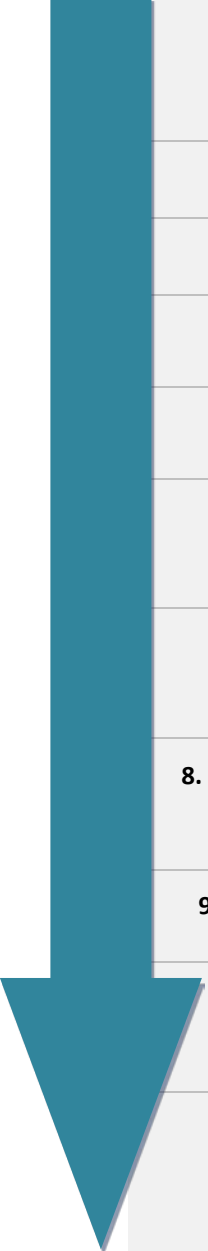# 6 Participating in the study series and initial steps

In 2016, ODE conducted an analysis of country suitability based on Post interest. To the extent possible, the study series should reflect the complex and varied characteristics of Australia's partner countries – small island states, middle income countries and conflict-affected or fragile states – and modalities that Australian aid investments use.

As studies require human and financial resources, EDC, ODE and Posts should consider other factors which are outlined in Box 2. These can be explored during the initial step, which is to scope the study.

Box 2: Factors to consider before committing to a teacher development study

✓ DFAT's education investment includes a strategy related to teacher professional development

✓ DFAT's education investment is a medium to long-term investment

✓ DFAT is a contributing donor to the education investment

✓ Post and the partner government is interested and has time available to support the study

✓ There are human resources available and able to facilitate the in-country field work, such as a DFAT M&E service provider or research institute

✓ Government counterparts are likely to endorse the study, participate in governance processes and provide access to data and schools

✓ Teaching and learning data, ideally covering three time-points, is either available, planned or can be collected. Data needs to be available in Excel or SPSS formats and provide data at the student level (one student per row). If student level is unavailable, classroom or school level data is the preference, with one classroom or one school per row. (Should codes be used within the data, a code book should also be provided).

Figure 2 outlines the steps in the study process. Although the steps are presented in a sequential order, complexities in context may mean that steps or approvals are revisited, and that some steps take place concurrently.

1. Consultation	EDC and ODE consult with possible Posts on their interest
2. Post interest	Post expresses interest
3. Select evaluator	EDC works with EAS to select evaluator
4. Scope the study	Research team undertakes an in-country mission to scope the study
5. Develop study plan	Research team develops an study plan with budget
6. Approve study plan	Study plan is reviewed and approved by DFAT and counterpart government. DFAT and potentially others (including partner country) allocates budget
7. Engage research team	EAS engages personnel or works with a third party (e.g. DFAT-funded M&E facility) to form a research team
8. Manage study methodology and workplan	Research team manages the development of the study methodology and workplan, including in-country logistics
9. Manage study implementation	Research team manages collection and analysis of data
10. Produce quality reports	Research team produces reports – progress reports and reports on findings which are reviewed by the Study Governance Committee
11. Disseminate reports and support use of findings	Research team makes reports available and engages with primary intended users to make the results accessible. EAS supports DFAT to use effective strategies to enable use of findings

Figure 2: Steps in the study process

Step 4 is an important step as it allows the research team to consult relevant stakeholders and consider carefully what the study needs to do before designing the study. This step will: clarify what will be researched; describe the program strategy; identify primary users; develop key research questions; decide on timing of the study; and, identify what resources will be available for the study and what will be needed. It is also one of the first steps towards gaining understanding and endorsement from the partner government. The product of this scoping will be the study plan. Given the complex and fluid contexts in which DFAT works, the study plan is considered a 'working document' that is reviewed and updated as required.

7 Method

A key feature of the method is the **multi-year duration** of each study. This is important for several reasons. First, it acknowledges the complex nature of teacher learning and that sustained change in teaching practice takes time. Second, it acknowledges the scale of the program investments. And, third, it will enable an agile and adaptive study approach that is responsive to contextual affordances (e.g. use of existing and planned data collection points) and contextual limitations (e.g. possible timeline shifts in program aspects). There is also potential to inform improvement through any subsequent phases of investment in teachers and teaching.

The IEC has developed a checklist for improving teacher development studies (Box 3). The requirements are discussed in more detail below.

Box 3: Checklist for improving teacher development studies

The IEC has indicated it expects future teacher development studies will:

- obtain evidence of how and to what extent teacher development has affected teachers' knowledge, practices and students' learning outcomes

- be proportionate considering the value and scale of the investment, and the availability of human and financial resources for the study

- include measures to verify whether trained teachers are routinely present (i.e. not just turning up for testing, observation, or other 'evaluation events') and teaching throughout the school term

- include at least three data-collection points (ideally baseline, mid-intervention, and on completion)

- have a sample size and sampling methodology sufficient to accurately estimate effects

- make some attempt to attribute changes in learning to the teacher development intervention, for example, using time series analysis, natural comparisons or program theory to justify causal claims – experimental designs are not expected

- use a combination of quantitative (e.g. survey response, test scores, education system data) and qualitative (e.g. document review, classroom observation, interviews) methods so the results can be triangulated to strengthen validity.

Source: ODE 2016a, Concept Note – Teacher Development: Phase 2, p. 3.

Where possible, the study series will use **existing data and newly collected data.** By using these two types of data, the scope is broadened as much as possible given the human and financial resourcing for the series, and reflects proportionality. Using existing and newly collected data will also allow findings to reflect the reality that many of the investments are mid-stream. To the extent possible, there will be **three data collection points**, ideally baseline, mid-intervention and completion.

The study series will also take a **mixed methods approach** utilising both quantitative and qualitative methods. Both quantitative and qualitative methods will be used to confirm or

cross-validate findings[5], and data collection will occur over the duration of each study. For example, students who have a high non-attendance rate could be targeted in a case study to understand better the reasons for non-attendance, whether it be due to lack of motivation, lack of resources for travelling to school, having to stay at home to care for a dependent family member, or other reasons such as teacher attendance and time on task.

7.1   Attribution

Attribution seeks to identify how a given activity specifically resulted in an identified outcome. Attribution is easier to establish when there is a clear causal relationship between the outcome and any preceding outputs. For example, that immunising children resulted in fewer cases of that disease. In education, attribution is difficult to establish, as it is hard to identify the specific factor that resulted in an outcome. For example, are children performing better in standardised tests because of teacher training, or the availability of textbooks, or changes to the school curriculum? Whilst even these factors could be tracked within the school context, they do not include other extraneous factors such as, improved nutrition, change in the availability of light in order for the student to read or complete homework, or extra tuition outside school.

Teaching itself is a 'noise-filled' context. There are a wide range of contextual factors that enable and constrain productive investments in teachers, teaching and education communities, for example, budgetary constraints, and political priorities within schools and the larger national context. While there may be relationships between various factors associated with student learning outcomes, direct causal relationships are difficult to determine.

Program designs and theories of change generally seek to understand and describe causal relationships necessary to establish attribution (i.e. this input caused that outcome). Often activities are linked to outcomes, to establish their contribution to a change (i.e. this activity, along with several others, contributed to that outcome).

For the duration of a number of the studies, investments in teaching will have already been implemented in schools. This means there will not be a control group to compare outcomes, making the identification of cause and effect difficult. This series recognises that there may be effects from other teacher-focused programs.

Therefore, it needs to be acknowledged that the issue of attribution of learning outcomes to a particular program or investment in education is complex. This study series does not include a randomised controlled trial. In other words, it is investigating existing investments that are designed to reach a specified number of teachers in a particular country. While this series explores the investment in teaching quality funded by DFAT, it acknowledges that other programs may have contributed to overall improvement in teaching quality and student learning outcomes. As such, efforts will be made to take into account data and reported outcomes from other investments in teachers in the analysis to understand if other factors have contributed to the outcome of interest

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[5] See for example, J.W. Creswell & V.P. Clark 2007, Designing and conducting mixed methods research.

The Australian aid program can rarely claim that a given activity exclusively caused an outcome (attribution). Rather, investments typically only contribute a portion to outcomes (contribution).

7.2   Quantitative data

Various sources of existing quantitative data are available from learning assessment data, investment program monitoring data, classroom observations, class attendance, and the Education Management Information System (EMIS). As these sources of data are ongoing assessments and in some cases real-time information systems, they will be continued to be collected and collated through the study series. The data relates to the different types of student and teacher outcomes defined in Table 1. For example, learning assessment data through national assessments (such as the Early Grade Reading Assessment (EGRA), Early Grade Mathematics Assessment (EGMA)) and regional learning assessments (such as the Pacific Islands Literacy and Numeracy Assessment (PILNA)) are measurements of students' cognitive learning. Classroom observations and class attendance can provide evidence for students' engagement and motivation in non-cognitive outcomes and teaching quality.

7.2.1   Sampling method

Each collection of quantitative data analysed for these studies uses a sampling approach appropriate to the study and method. For large scale assessments of student learning outcomes (e.g. national and regional assessments), the general practice is that the sample design is negotiated with countries via a series of sampling forms, capturing aspects such as age of entry, population coverage, school and student level exclusions, and stratification variables.

Population surveys or EMIS surveys rely on a census approach to gathering data which covers all members of a specified population (e.g. all schools and students in a country). These surveys will be used to inform the sampling strategy to ensure that the sample obtained is representative. Sample sizes can vary between different data sources and countries depending on the assessment purpose, geographical context and budget limitations.

7.2.2   Analysis method

A critical step in data analysis is the cleaning and collating of all data sources. This involves:

- translating any responses into English

- developing codebooks/data dictionaries if non-existent, to understand the variables in datasets

- examining cases and reasons for missing data, pursuing the possibility that this missing data may be filled in

- determining the percentage of missing data and how best to deal with it (e.g. imputation or deletion methods)

- removing duplicate values

- coding data variables so that they are consistent across datasets and usable in statistical software (e.g. female = 1, male = 1). With no consistent data strategy or

coding practice in place already, it is not unusual to find one data value such as 'female' to be coded in many different ways, such as capital 'F', small letter 'f', abbreviations 'Fem', complete spelling 'Female' or 'female', or any numeric value

- matching data sources to EMIS data so that characteristics of individuals or schools, can be aligned with the data

- assigning unique values to each data point and anonymising the data for data security purposes

- collating all data sources into one database to be analysed.

Additional complexities are present in collating all data sources as assessments administered in different years may be slightly different. Common variables between the different years will need to identified and set as the baseline denominator.

The series will provide a comprehensive report on the descriptive statistics for each country and data source. These descriptives will illustrate the key features of the data collected in the country in an easily accessible manner, broken down by characteristics of interest, e.g. gender, disability, rural/urban distinctions.

Where possible, correlations will be carried to understand whether certain outcomes may be related to certain factors. Deeper analysis could be undertaken with regression analysis by incorporating and controlling for certain characteristics. For example by systematically adding characteristics in a stepwise regression could insinuate that certain characteristics have a greater influence on the specified outcome than others. Relevant tests will be carried out alongside the regression analyses to understand the possible direction of relationships, and to rule out issues of endogeneity.

Whilst these analyses do not imply causality, they may provide initial indications and trends. These analyses may also point to further investigation or data collection in order to determine causality.

7.3 Qualitative data

Teaching, teachers' work and student learning are complex. Qualitative research in education obtains evidence of perceptions and experiences of stakeholders to provide a more holistic overview of teachers and teaching, particularly related to the factors that might affect student outcomes. Partner governments are key stakeholders, especially in supporting the design and implementation of each study. The most critical aspect is that each study is of use to partner governments in order to support planning and policy to sustain ongoing development of teachers and teaching quality.

Data are gathered using a range of methods, with surveys, interviews, focus groups, field visits and observations being primary collection methods for the series. Qualitative research captures data on perceptions of actors, providing a holistic overview of the study and multiple interpretations of data.[6] Importantly, a key tenet of qualitative research is that "reality is constructed by individuals interacting with their social worlds".[7]

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[6] Miles, M.B. & Huberman, A.M. 1994. Qualitative data analysis.
[7] Merriam, S.B. 1998, Qualitative research and case study applications in education, p. 6.

The remainder of this section discusses the qualitative methods specific to this study, including teacher surveys, classroom observations, case study methodology, interviews, focus groups and field visits. To ensure value for money, the study may draw on existing data already collected, such as classroom observation data.

In the context of this series, case study methodology underpins the approach to explore contexts of teacher professional development in more depth. This constitutes newly collected data. Guides and field research protocols will be designed specific to each country study, and will be designed to address each of the overarching questions articulated in each study plan.

It will be important to involve partner governments to select the methods most appropriate to the context and research questions, and to select sites and participants.

7.3.1 Teacher surveys

The incorporation of pre- and post- teacher surveys can provide important baseline and program end information on teachers' perceptions of the value of the professional development program and its influence on their teaching practice. If programs are underway prior to the study commencing, making pre-surveys not achievable, surveys can be implemented to capture teachers' views at appropriate intervals during their involvement in the professional development cycle. Instruments would be specifically designed to address the particular professional development context.

7.3.2 Classroom observations

Although some classroom observation data is of a quantitative form, classroom observations can also provide opportunity to gather rich details / thick descriptions about teacher-student interactions and teaching practice. In this series, some countries have included the collection of classroom observation data as part of their program monitoring activities, and plans are in place for the collection of additional evaluative classroom observations. Where there are no planned classroom observations and these would be appropriate, existing tools can be applied or adapted to ensure they are fit for purpose. These tools include ACER designed tools, the Classroom Assessment Scoring System (CLASS), Stalling's Classroom Snapshot Observation instruments and World Bank's Service Delivery Indicators questionnaire. ACER has expertise and capability in the area of developing classroom observation tools and methodologies fit for context.

7.3.3 Case study methodology

Case study methodology enables rich descriptions of program details and program outcomes, and is ideal to use when a holistic multi-perspective analysis is required. Through case studies, detailed information can be obtained about the kinds of affordances and constraints that work to support or disrupt program success, and important contextual information can be gathered to assist the interpretation of program results and to inform recommendations arising from program evaluations.

Data is gathered from a range of sources (e.g. focus groups, observations, interviews) to provide in-depth understanding of a particular school community or educational context over time. Specific to this series, case study methodology will enable descriptive explanations of

how investments in teaching impact local educational communities, in addition to the broad data collections available in learning assessments and surveys. The research teams will spend up to a week at schools and school communities to explore how DFAT's investments in teaching work in context. Schools will be selected using purposive sampling (described in the following section). See Box 4 for a summary of the case study approach in Vanuatu.

Box 4: Case study methodology for Vanuatu's Investment in Training and Supporting Teachers to Implement the New Curriculum in the Vanuatu Education Sector

The study will use case study methodology to gather data that will provide in-depth understanding of leaders' and teachers' experiences and participation the teacher quality improvement program funded by Vanuatu education Support Program (VESP). It will also use focus group discussions and interviews with a selection of stakeholders beyond the case study sites (including Ministry of Education and Training national officers, provincial and school leaders, Vanuatu Institute of Teacher Education and In-Service Unit trainers and lecturers, VESP project team members, parents, and community members). This range of perspectives will provide insight into the impact of VESP on teaching quality, curriculum implementation and student learning.

Source: Education Analytics Service 2017b, Study Plan for Vanuatu's Investment in Training and Supporting Teachers to Implement the New Curriculum in the Vanuatu Education Sector, version August 2017.

7.3.4   Interviews

The research team for each country will develop interview guides to conduct semi-structured interviews with a range of education stakeholders. Stakeholders include not only those in case study communities, but also staff in relevant ministries, teachers' colleges or universities and implementing agencies. This strategy enables a range of perspectives about the teaching investment to be collected at both national and local levels. The World Bank's Service Delivery Indicators survey instruments provide a reference for the development of interview guides.

7.3.5   Focus groups

The research team also proposes to conduct focus groups at case study sites and with key stakeholder groups (e.g. Ministry of Education personnel). Focus groups have the advantage of enabling participants to talk in a group setting about their experiences, perceptions and beliefs about the impact of a teaching investment. As a more conversational format, participants can reflect and build on ideas of each other.

7.3.6   Field visits

Field visits are a key part of the case studies. The research team will have the opportunity to observe teachers and schools in their natural environments, and gain an appreciation of the challenges and successes for teachers and their schools. Importantly, field visits will enable the team to understand how a teaching investment is experienced by teachers in their contexts.

7.3.7 Sampling method

Purposeful sampling is commonly used in qualitative research, and is recommended for the sampling approach for the case studies in the study series. Purposeful sampling is non-representative but allows a sample to be constructed based on a specific need or purpose. For each study, cases will be selected with the input of in-country colleagues based on specific criterion (e.g. geographic, well-performing, duration of intervention). Cases will be selected to represent the range of educational and teaching contexts where DFAT has committed teacher-focused investments. Each country will include multiple case studies – within the allocated budget – to reflect the diversity of educational experiences, outcomes and situations. In analysis, detailed accounts of each case will be documented and include cross-case comparison.

7.4 Limitations

There are some limitations to this study series specifically related to context-specific issues. First, the studies were not part of the original designs for DFAT's teacher and teaching quality investments. As each country study uses data that is available, supplemented by new data collections where feasible, the data collections may not entirely be fit for purpose for each study. Some DFAT investment programs may have developed some internal monitoring and evaluation activities (for example, a small sample of pre- and post- learning outcomes tests in Vanuatu).

In addition to this, socio-economic, cultural and political contexts may affect how a teaching professional development investment is received and taken up by teachers. Some of these external factors may provide insight into teaching quality, particularly as generated from qualitative evidence.

This series also recognises the complex nature of attribution. As discussed earlier, the Australian aid program can rarely claim that a given activity exclusively caused an outcome (attribution). Rather, investments typically only contribute a portion to outcomes (contribution). For example, other teaching investments by other donors may also impact teaching quality. If the data is available at the individual student level, and can be matched to all the different characteristics that may have direct or indirect effects on learning outcomes, it may be possible to attribute change via dynamic structural equation models (or time series analysis). Structural equation models can establish the relative influences and relationships of various characteristics on measured outcomes. The strength of the relationships are expressed as coefficients that represent predictive links between two factors, taking into account all the relationships between other factors in the model. The premise of the basic model would be based on underlying educational theories and tested using the data collected in the study series. The model would then be tested for how well it 'fits' the basic model, and modified in a logical manner to obtain the best fit.

However, the limitations with this study series is that the definitions of indicators, methods of collecting data, and instruments used to collect the data may have changed over time, which

raises questions of data comparability.[8] Even though it does not appear likely that causal analysis will be a possibility in this study series, much can be learned from the descriptive data, its subsequent categorisations by demographic, school, or other characteristics, and correlational analysis.

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[8] See for example National Center for Education Statistics 1996, International Education Indicators: A time series perspective.

8   Reporting requirements and resources

8.1   Reporting requirements and timing

The study series will include a staged formative approach to reporting by country to ensure the plan is responsive to contextual factors and the needs of country-level primary users. Findings can be used to strategically inform the education investment.

The reports will be prepared and delivered by the research team. The following country reporting process is planned. The primary audience of each is the study governance committee.

- **Progress Updates** (six-monthly, excluding overlap with Interim/Final reports) which will summarise progress on activities against the study plan, challenges and next steps. Progress Updates will identify high level issues that require a response or guidance from the study governance committee.

- **Interim Findings Reports** (annual) which will present interim findings for each of the research questions, key lessons, and recommendations for the program. Interim Findings Reports should be reviewed by the study governance committee with any stakeholder feedback incorporated.

- **Final Report** (at study completion) which will present conclusive findings for each of the research questions, key lessons, and recommendations for the program. The Final Reports should be reviewed by the study governance committee with any stakeholder feedback incorporated.

To the extent possible to align across the series, each study will follow a May and November reporting schedule.

As part of this reporting schedule, the research team will update the study plan annually to reflect changes in approach, including but not limited to, changes in methodology, data sources and schedule.

This reporting process includes quality assurance measures through stakeholder inputs, review and endorsement, and EDC and ODE review and approval. Where there are any disagreements, these will be noted in the reports. The reports will make clear any limitations of the study and any constraints influencing the process, including the extent to which these affected the ability to draw findings and conclusions for specific components of the study.

The documents will adhere to DFAT's latest Monitoring and Evaluation Standards and be fit for publication on DFAT's internet site. Reports should adhere to DFAT's Style Guide.

8.2   Supporting the dissemination and use of findings

To maximise the learning potential within each study and across the series, it is important to consider early on in the process, the content, dissemination and use of findings and how best to support this through various written, visual and verbal products.

8.2.1   Study series

It is important that findings (interim and final) from the series are communicated internally within DFAT and externally. These communication products and events (see Table 2) will assist

DFAT in ensuring it meets recommendations 1, 2 and 3 of *Investing in Teachers*. There is also the opportunity to utilise the findings from the studies to publish 'good news stories' as part of DFAT's public diplomacy strategy.

Table 2: Communication products and events to support dissemination and learning

Product / Event	Audience
Learning events	
➢ Six-monthly learning updates – share lessons learned from the study process	Internal – participating Posts, EDC, ODE
➢ Annual forum on interim findings and emerging themes	Internal – Posts, EDC, ODE, community of practice
➢ Presentation at conferences – e.g. UKFIET, RISE	External
Resources for practitioners	
➢ Synthesis papers – synthesises findings from each study and any broader commentary that can be made across the series	External
➢ Policy briefs – summarises the policy implications from the series	External
➢ Thematic papers – focuses on a theme that is emerging from the series, e.g. use of ICT, promoting female leadership, mentoring approaches	External
➢ Teacher development method papers – provides guidance on how to design interventions, e.g. to ensure reach and scalability	Internal – Posts, EDC, ODE, community of practice
➢ Monitoring and evaluation notes – provides guidance on the appropriate indicators and data for monitoring and evaluating teacher development investments	Internal – Posts, EDC, ODE, community of practice
Public diplomacy products	
➢ Blogs – focusing on findings from each study and themes	External
➢ Case studies and interviews – focusing on the experiences of participants in the DFAT program, including written, audio or video ➢ Reflections / findings from across the series	External

8.2.2 Country-level studies

In addition to the reporting requirements set out in section 8.1, to support the different sets of stakeholders, each research team should work with the primary users and stakeholders (particularly partner governments) to determine what other form they wish to receive the

country-level reports. Options can include executive summaries, feedback workshops and verbal briefings, newsletters, or more visual tools such as videos and infographics. These should be included in the study budgets as part of the communication plan.

9 Roles and responsibilities

9.1 Study series

A level of technical and management oversight is proposed across the series to ensure the conceptual framework is implemented, to ensure quality control, and to improve efficiencies. This is represented by the diagram in Figure 4.
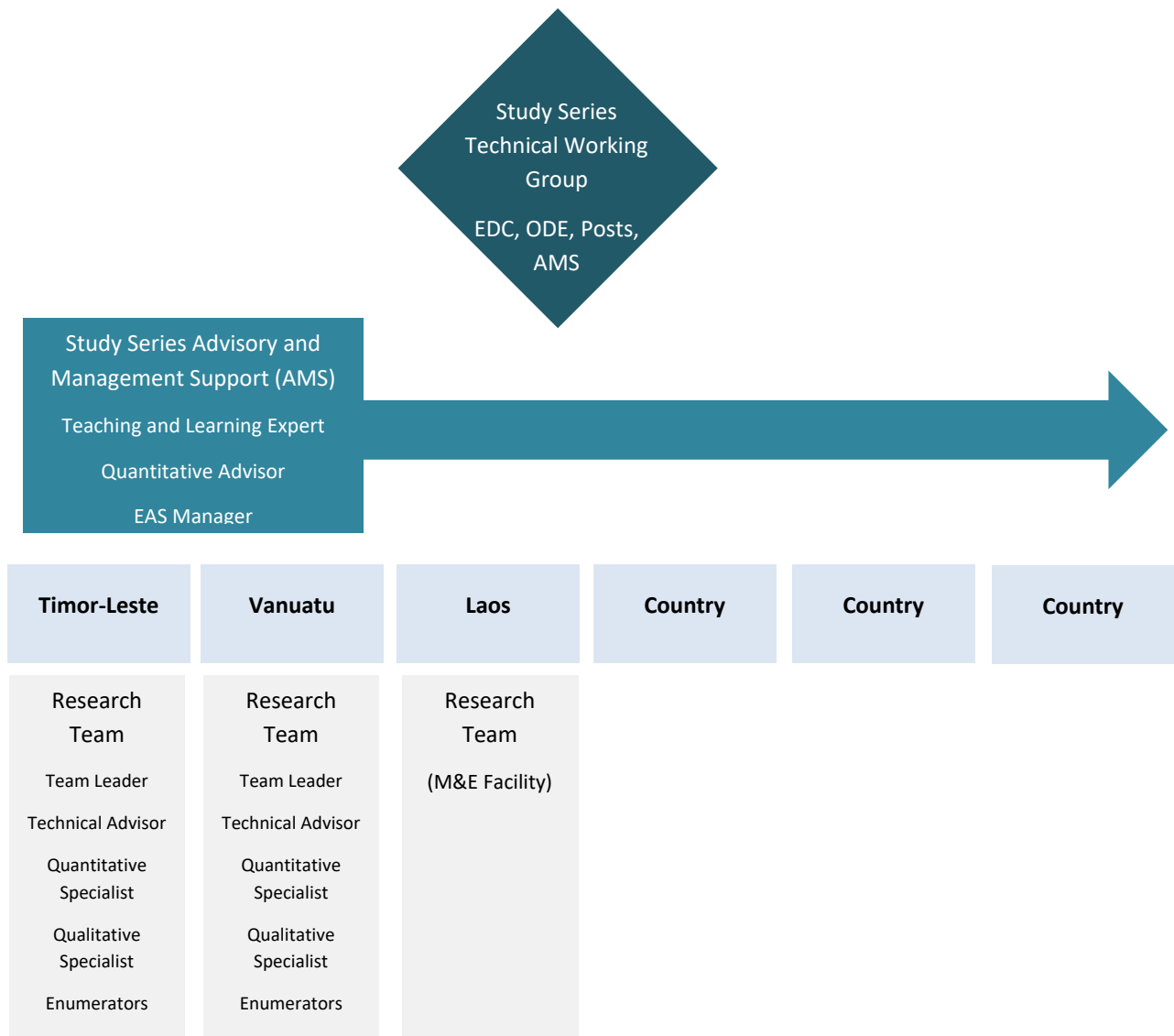

Figure 3: Technical and management oversight for the study series.

The membership and roles and responsibilities of the two technical and management groups are as follows:

- **Study Series Technical Working Group:** EDC, ODE, ACER and Posts, that would meet quarterly to six-monthly, depending on the number of country programs joining. This working group would troubleshoot difficult issues, consider program reports, share cross-program learning, and propose learning products and events to disseminate findings.

- **Study Series Advisory and Management Support:** This team would provide technical and operational support across each of the studies. Short term inputs could be specified on a draw down basis given the numbers of country programs is unknown. This would comprise of a teaching and learning expert, a quantitative adviser and the Education Analytics Service Manager.

9.1.1 Country-level study

The roles and responsibilities of stakeholders may vary within each country, but will generally be in accordance with Table 3.

Table 3: Roles and responsibilities for country-level studies

Stakeholder	Roles and responsibilities
Study governance committee	➢ Endorsing the study plan ➢ Reviewing progress reports and responding to high level issues identified ➢ Reviewing and endorsing findings. Members should include DFAT Post, EDC, ODE and the Ministry of Education at a minimum. This committee may be the same as the investment program governance group. For example, the PLMP Steering Committee in Timor-Leste.
DFAT Post	➢ Overseeing the management of the study ➢ Study focal point and liaison with in-country stakeholders ➢ Managing data sourcing from data holders and obtaining consents to access data ➢ Coordinating participation in the study governance committee ➢ Facilitating field visits and providing office space for the research team ➢ Where an in-country third party will support the study (e.g. M&E facility), support the creation and ongoing maintenance of the partnership.
Ministry of Education and government stakeholders	➢ Participating in the study governance committee ➢ Supplying data ➢ Participating in research activities and their development, including selection of case study sites and interviewees ➢ Providing consents to access data and schools.
EDC	➢ Providing input and approving initial study plan ➢ Consolidating comments and feedback from stakeholders ➢ Approving emergent study design ➢ Providing multi-year funding for the study ➢ Managing overall contract with ACER and accepting and approving deliverables ➢ Participating in study governance committee.
ODE	➢ Providing input into initial study plan

	➢ Providing feedback on emergent study design
	➢ Providing multi-year funding for the study (where agreed/necessary)
	➢ Providing feedback on deliverables
	➢ Reporting to the IEC.
EAS	➢ Liaising with EDC on study needs
	➢ Developing EAS work requests
	➢ Engaging research teams
	➢ Oversighting development and implementation of the study
	➢ Quality assuring deliverables
	➢ Input of the study series
	➢ Study series reporting
	➢ Budget input and reporting
	➢ Study series advisory and management support
	➢ Teaching and learning expert
	➢ Quantitative advisor.
Research team	➢ Undertaking scoping and developing study plan
	➢ Designing detailed study and emergent components
	➢ Designing/participating in data collection
	➢ Managing in-country research team
	➢ Managing data analysis and reporting
	➢ Ensuring DFAT policies and requirements are complied with (e.g. Child Protection Policy).
	In most cases, the research team will comprise of a team leader supported by experts in quantitative and qualitative methods, with technical inputs from a teaching and learning expert.
In-country third party, e.g. M&E facility, managing contractor, research institute	➢ Providing data for the study
	➢ Providing logistical support
	➢ Recruiting personnel such as national enumerators and researchers.
	Scope of role and responsibility depends on the arrangements in-country.
In-country development partners	➢ Supplying data
	➢ Providing feedback on study design
	➢ Providing feedback on findings.

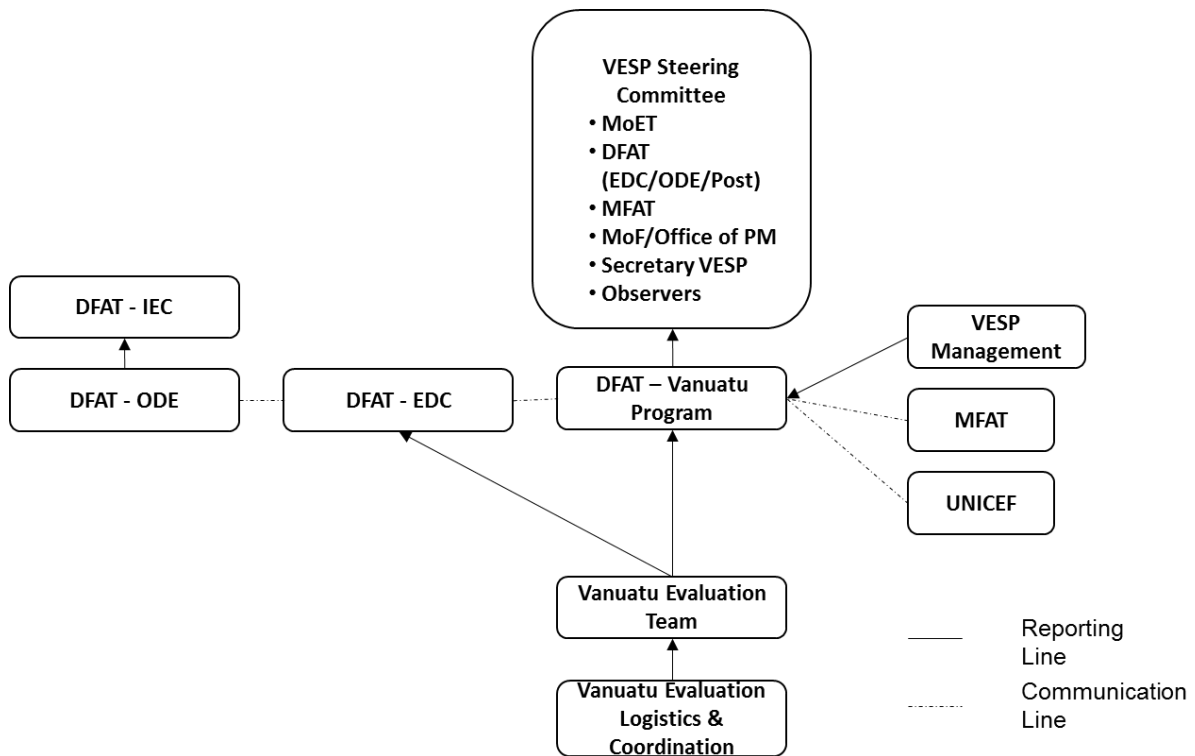Figure 5 provides an example of the reporting relationships in the Vanuatu study.

Figure 4: Reporting relationships in the Vanuatu study

Source: EAS 2017b Study Plan for Vanuatu's Investment in Training and Supporting Teachers to Implement the New Curriculum in the Vanuatu Education Sector, version August 2017.

10 Review and updates

The conceptual framework is a working document and will be reviewed and updated as agreed by the Technical Working Group.

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