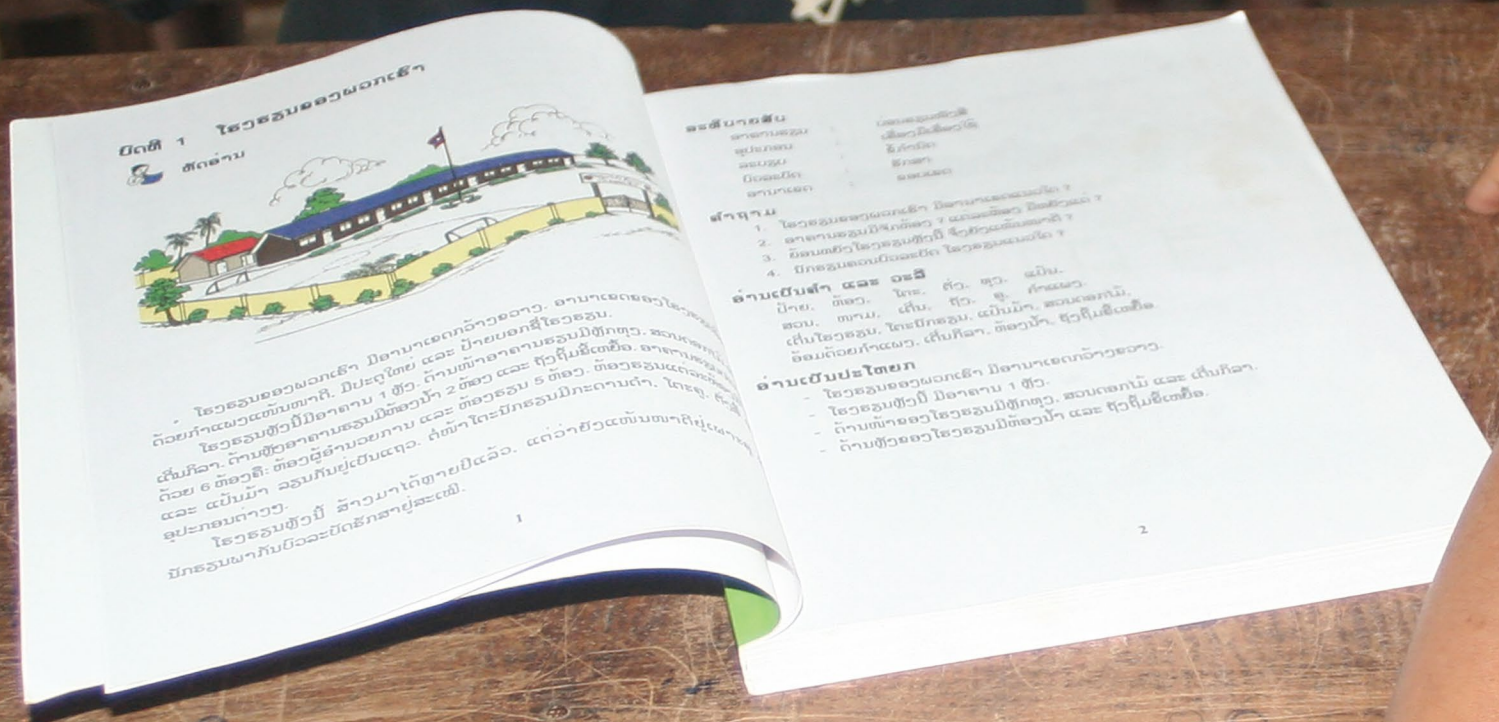


EDUCATION ANALYTICS SERVICE: TEACHER DEVELOPMENT MULTI-YEAR STUDIES



Using case studies to investigate and understand teaching quality and student learning: Initial lessons learned

Jennie Chaaney, Debbie Wong, Elizabeth Cassity and Hilary Hollingsworth



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The Australian Council for Educational Research Ltd

19 Prospect Hill Road

Camberwell VIC 3124

Phone: (03) 9277 5555

ABN 19 004 398 145

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Executive Summary

This paper presents some initial lessons learned about the use of case studies as a key form of evidence regarding teaching quality and student learning in a multi-year teacher development study series. This study series, commissioned by the Australian Government's Department of Foreign Affairs and Trade (DFAT), involves the investigation of teacher development initiatives in Lao People's Democratic Republic (Laos), Timor-Leste and Vanuatu. The overall aim of the study series is to understand the extent to which the Australian investment has improved teaching quality and student learning. This paper discusses the processes used to design, implement, analyse and report case study data, and key lessons learned about these that could be applied to other contexts and programs.

These processes include:

- **Design:** Adopt a multiple-case design to ensure understanding of teacher development investments across different contexts and to account for variation. Apply purposeful sampling in consultation with DFAT at Post and in-country research partners. Design and translate data collection instruments in consultation with in-country research partners.
- **Implementation:** Undertake preparation activities to collect preliminary case study data, engage research participants and confirm logistical details in planning for field work. Conduct training with in-country research organisations. Undertake field work including stakeholder interviews, focus group discussions and observations. Implement quality assurance mechanisms and manage data securely.
- **Analysis and reporting:** Undertake a review of data collected for quality assurance purposes. Transcribe data. Analyse data including creating a coding framework, coding data, theory building and assessing the analysis. Report the findings based on the needs of the target audiences.

The key lessons are:

- **Design:** Longitudinal and multi-site case studies allow for different measures of analysis that respond to varied contexts and needs. Consultations with in-country partners are vital to ensuring high quality study designs, including sampling designs. Classroom observations supplement other evidence on teaching, such as interviews with teachers and school leaders.
- **Implementation:** Opportunities to refine the data collection tools during training, piloting and actual field implementation maximise contextual relevance, and accurate and consistent data capture. Quality assurance mechanisms enable the identification and resolution of issues that otherwise may risk the quality of the data. Documentation of field work enables refinement of tools and processes.
- **Analysis and reporting:** Involvement of field researchers in data analysis enables the inclusion of rich data and facilitates researcher capacity building. In-country partners can provide valuable input at the reporting stage.

Introduction

The inextricable link between teaching quality and student learning outcomes is widely acknowledged. As such, the improvement of teaching practice has become the focus of many education systems' policies and programs. However, a question of great interest to policymakers and practitioners alike is: how do we know whether such initiatives actually develop teaching quality, and in turn, improve student learning outcomes?

This paper presents some lessons learned about the use of case study methodology as a key form of evidence regarding improved teaching quality and student learning in a multi-year teacher development study series. This study series was commissioned by DFAT to investigate teacher development initiatives supported by the Australian Government in three countries: Laos, Timor-Leste and Vanuatu. Each country is introducing a new primary education curriculum in stages, hence the teacher development initiatives are primarily designed to support the implementation of the new curriculum as well as support teachers to adopt a range of new pedagogical approaches embedded in the new curriculum.

The study series uses a mixed-methods data collection approach to investigate teaching practice and student learning in each location, including the use of in-depth case studies, student learning assessments, and where possible large-scale surveys.

Case study methodology was selected to provide rich descriptions of program interventions and outcomes from the perspective of a range of educational stakeholders. Case studies are ideal for this kind of multi-perspective analysis, and enable the collection of detailed information on the kinds of affordances and constraints that support or disrupt program successes, as well as important contextual information that assists the interpretation of program results.

The paper is structured in four sections. Firstly, overviews of the three country studies are presented to provide contextual details. Then, the processes used to design, implement, analyse and report on case study findings are described, as well as lessons learned about these. Finally, key lessons learned which might be applied in other programs and contexts are presented.

Overview of each study

Context

The Australian Government is supporting significant education reforms in Laos, Timor-Leste and Vanuatu through the introduction of a new primary curriculum and associated teacher development initiatives.

The following DFAT education programs are the focus of each study:

- **Timor-Leste:** Apoio Lideransa liuhusi Mentoria no Apredizajen (ALMA)
- **Vanuatu:** Vanuatu Education Sector Program (VESP)
- **Laos:** Basic Education Quality and Access in Laos Program (BEQUAL).

The scope and approach to teacher development varies across each country context. The programs in Vanuatu and Laos cover the new curriculum materials and accompanying in-service training programs, whereas DFAT's program in Timor-Leste focuses on supplementing the education ministry's investment in new curriculum materials and in-service training with follow-up professional learning support.

Also, as each country is at a different stage of their curriculum rollout, each study also commenced at different times. This has provided the study team with an opportunity to learn from and refine each study, highlighting the benefits of a multi-country and multi-year study series.

Key features of the study series

The overall aim of each study is to investigate the following overarching question:

“To what extent does the Australian investment produce improved teaching quality and improved student learning?”

Specific questions related to this broad overarching question have been designed for each study to reflect each unique context. These are presented in Table 1.

It is important to highlight several features of this study series:

- **Multi-year:** The multi-year design recognises the scale of the investment by DFAT and partner governments and acknowledges the complexity of teacher development and that sustained change in teaching practice takes time.
- **Mixed methods:** The studies use a mixed methods approach, analysing both existing and newly collected quantitative and qualitative data sources (refer to Table 2).
- **Partnership:** The studies benefit from a close partnership between the Australian Council for Educational Research (ACER), the in-country research partners, DFAT at Post and in Canberra, and the relevant education ministries.

	Timor-Leste (ALMA)	Vanuatu (VESP)	Laos (BEQUAL)
Overarching question	To what extent does this aid investment produce improved teaching quality and improved student learning?	To what extent does this aid investment produce improved teaching quality and improved student learning?	To what extent does BEQUAL support improve teaching quality and student literacy in Lao PDR?
Key questions	<ol style="list-style-type: none"> 1. To what extent does the ALMA program support improved teaching quality in Timor-Leste? 2. To what extent does the ALMA program support the effective implementation of Timor-Leste's National Basic Education Curriculum? 3. To what extent does teacher involvement in the ALMA program lead to improved learning outcomes for Timor-Leste students? 	<ol style="list-style-type: none"> 1. To what extent has the investment improved teaching quality in Vanuatu? 2. To what extent has the investment in teacher training and mentoring supported effective implementation of Vanuatu's new curriculum? 3. To what extent have teacher training and support activities led to improved learning outcomes? 	<ol style="list-style-type: none"> 1. To what extent and how does teaching quality change following BEQUAL-supported in-service program? 2. To what extent and how do students' literacy outcomes change following the new curriculum implementation?

Table 1. Research questions being investigated in the three countries

	Timor-Leste (ALMA)	Vanuatu (VESP)	Laos (BEQUAL)
Quantitative	Existing student assessment data.	Existing and planned student assessment data.	Newly collected survey data from teachers and principals and student assessment data.
Qualitative	<p>Range of school case studies – purposively selected by ALMA phase and municipality each study year.</p> <p>Individual and group interviews with education stakeholders, classroom observations from 2021/22.</p>	<p>Range of school case studies – purposively selected by province or island each study year.</p> <p>Interviews and focus group discussions with education stakeholders, classroom observations from 2021/22.</p>	<p>12 school case studies – purposively selected by province for the duration of the study (longitudinal).</p> <p>Interviews with education stakeholders, classroom observations.</p>

Table 2. Data sources for the three country studies

Design of the case study methodology

Design considerations

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. Data for the studies is gathered from a range of sources including interviews, observations and focus group discussions, to provide in-depth understanding of selected school communities or educational contexts. Case study methodology enables descriptive explanations of teaching impact, which can add to findings from large scale learning assessments and surveys.

A multiple-case design was implemented in each country to explore how the investments play out in different classroom settings, schools and local government areas. This design also accounts for variation – in other words, understanding how individual cases contribute to a collective whole, and enhances the robustness of the studies. The studies are intensive, rather than extensive, and investigate small samples with greater detail, using a multitude of defined variables. While the case studies are not intended to generalise the impact of the teaching investments, they are intended to explore and explain the contextual experiences of educational stakeholders in each country.

Sampling design

Purposeful sampling is commonly used in qualitative research, and was the technique applied for the case studies across all three countries. It is non-representative and allows a sample to be constructed based on a specific need or purpose. For each study, cases were selected with the input of in-country research partners and DFAT at Post, based on specific criterion (e.g. geography, school performance, timing of intervention). Cases were selected to

represent the range of educational and teaching contexts where DFAT has teacher-focused investments, and to reflect the diversity of educational experiences, outcomes and situations. In each country, the study benefits from strategic advice from in-country partners that includes partner governments, DFAT and implementing partners.

In Timor-Leste, the decision was made to sample participating schools across multiple municipalities to provide a diverse dataset. This allows for a wider breadth of analysis, which was a stated priority of the Government of Timor-Leste. Purposeful sampling was utilised to select the case study sites based on specific criterion including program phase, municipality, cluster and school, with input from DFAT at Post and the in-country research organisation. Two clusters with four to six schools each were selected. Data collected on ALMA program activities was sourced from the Eskola education data management website, and used to assess the intensity of program involvement, and patterns in student and teacher performance when selecting schools.

The case studies in Vanuatu explore the experience of the VESP investment by educational stakeholders in a small sample of schools across a multitude of variables and educational settings. The ability to extract this range and level of detail from the investment is an important part of the overall study design. ACER used data from Vanuatu's Education Management Information System (via OpenVEMIS) and VANSTA (Vanuatu Standardised Test of Achievement) to purposefully select schools. Specific selection criteria was used to select four to six schools within each province/island, including: 2017 VANSTA performance to obtain a mix of high and low performing schools; educational authority to obtain diversity of government and

church managed schools; language of instruction to include a mix of Anglophone and Francophone schools; and school size to cover small, medium and larger schools. The in-country research partner provided advice on access and logistics, considering time, distance and cost.

In Laos, a decision was made to prioritise a longitudinal design that enables the examination of changes over time with the same cases. This approach is designed to follow cohorts of students, teachers and principals over the course of the study period as the new Lao language curriculum is rolled out, to measure changes in teaching quality and student literacy outcomes pre- and post-BEQUAL support. Twelve case study schools in six districts, across three BEQUAL targeted provinces were selected purposefully. The six districts were chosen to include a mix of high and low education performing districts. Schools were then selected on the basis of being in the same cluster. District educational officers also provided advice to ensure the inclusion of schools that are ethnically and contextually diverse.

Instrument development

ACER designed data collection instruments to capture information that responded to each of the research questions set out in Table 1. Separate interview guides were developed with targeted questions to capture the perspectives of a wide range of education stakeholders. For each country study, a range of interview and focus group discussion guides were adapted, translated and piloted by in-country research partners, to ensure they were well targeted and contextually appropriate.

In addition, for the Timor-Leste study, ACER designed an observation tool and a group interview guide for teachers, to gain a deeper understanding of the peer-learning component.

For the Laos study, ACER developed a classroom observation tool to capture evidence

about teaching pedagogy, classroom environment, student and teacher interactions and student dispositions to learning. This instrument was informed by the new Grade 1 Lao language curriculum, the teachers' guide and associated teacher training.

Key lessons regarding design

Ensuring the study design responds to priorities and needs

An agile and adaptive approach was adopted for the teacher studies, ensuring that the case study design could be responsive to the stated priorities of each partner government and DFAT. Using two different research designs across the countries has presented different opportunities to measure program impact. In Timor-Leste and Vanuatu, the multi-year research design captures a range of population groups rather than just one subset, which allows a wider breadth of analysis. This approach is particularly beneficial when considering national and sub-national policy implications, as it allows a country-wide understanding of the program impact. On the other hand, the longitudinal design adopted for the Laos study enables measurement of change over time with the same cases.

Integrating classroom observations to strengthen the study design

Classroom observations enable the examination of targeted teaching practices to supplement accounts by teachers and school leaders to provide further evidence of change to teaching practice, student performance and engagement.

In Laos, the classroom observation tool is being used to gather evidence of Lao language teaching practice and student learning, across three points in time. The classroom observation tool was adapted and customised for inclusion in the Timor-Leste and Vanuatu studies, to supplement existing datasets and thereby strengthening the study design.

Implementation of the case study methodology

The case study implementation process consisted of three main activities: preparation activities, field research training and field work.

Preparation

The purpose of the preparation activities was to collect preliminary case study data, engage research participants and confirm logistical details in preparation for the field work. ACER worked closely with in-country research partners and DFAT Posts to confirm logistical details such as interview schedules, travel and accommodation. In-country research partners and DFAT Posts also facilitated introductory letters and phone calls to regional and provincial education offices about the study. While in-person scoping visits to the sampled sites by the in-country partner research organisation and DFAT Post were possible in Timor-Leste, these were not feasible in Laos and Vanuatu.

Training

Training workshops were conducted to build the capacity of field researchers to undertake case study data collection. In each country, workshops also involved piloting the case study protocols and instruments.

Training topics included:

- Overview of the study and intervention program
- Research ethics and child protection
- Data security, confidentiality and code of conduct
- Qualitative methodology
- Data collection techniques including interviews and observation
- Data collection instruments and protocols
- Roles, responsibilities and logistics

- Interview simulations.

Field work

The field work in all countries involved interviews with stakeholders including local government education officials, implementing partners, school leaders and teachers.

Additionally, the Vanuatu study included focus group discussions with parents, the Laos study included classroom observations, and in Timor-Leste there were observations of peer learning sessions.

Field researchers worked in pairs with one leading the interview, and one taking notes and operating audio recorders. Monitoring by ACER (or the in-country research partner in Laos) involved daily debriefs with the field researchers as a quality assurance mechanism, to reflect on interview processes, and discuss and address any challenges experienced.

Specific security and data management protocols were set up for each study, appropriate to their unique management arrangements. To ensure the security of the data, data were shared through a secure file exchange site. All subcontractors were also required to sign confidentiality forms as they had access to the data. Data, such as interview recordings, were later transcribed into English for analysis.

Key lessons regarding implementation

Forging strong partnerships to ensure quality of data collected

The strong partnerships between ACER and in-country research partners have been vital to ensuring the quality of the data. Across all three countries, the field researchers' knowledge and experience of local contexts enabled the refinement and improvement of data collection instruments. This in turn, ensured a more accurate and consistent qualitative data capture.

Likewise, the agile and adaptive approach adopted for the teacher studies enabled a responsiveness that ensured instruments have been refined as needed during training and the field work itself. This proved to be an important feature of the implementation process, demonstrated by the field researchers identifying where some of the translations lacked clarity or where there were issues with finding linguistically equivalent terms. For example, in Timor-Leste, questions were raised about the accuracy of the Tetum translation of 'student wellbeing'. In Laos, the term 'community of practice' had no Lao equivalent.

The ACER team were able to troubleshoot these issues with the language-proficient field researchers, to refine the problematic questions to ensure the contextual relevance, accuracy and validity of the data being collected.

Moreover, field researchers were able to advise on the appropriateness of data collection methods. For example, ACER initially planned to include teacher focus group discussions in Timor-Leste to enable efficient data collection from this comparatively large sample group. However field researchers raised concerns about the effectiveness of group discussions in Timor-Leste due to power imbalances related to age, gender and varied levels of experience amongst participants. To address this concern,

ACER proceeded with individual interview guides, to allow teachers to confidentially share their experiences.

In Vanuatu, questions on sustainability were added to enable richer data to be collected in these emerging areas of interest.

In Laos, field researchers liaised with the study team to clarify components of the classroom observation tool that were potentially open to interpretation. This enabled code descriptions to be refined and communicated to all field researchers 'in-time', ensuring consistent data capture across field research teams.

Adopting a strong and continued partnership approach has also enabled the ongoing capacity building of local field researchers. This has allowed subsequent training sessions to be targeted toward the individual needs of field researchers, to build on their existing skills and experience.

Building in quality assurance mechanisms helps identify and resolve issues

The local field research teams in all countries were accompanied, on occasions, by either members of the ACER team or the in-country research partner team. This quality assurance mechanism enabled observations of data collection processes, and debriefing about field work. This approach effectively supported the continuous improvement of the study by enabling the identification and resolution of issues that otherwise may have risked the quality of the data.

For example, some field researchers were observed to be not asking all of the questions included in the interview guides. In response, ACER utilised the debrief sessions to address this issue directly and also revised the training program to allow more time for interview simulations.

Debriefs also enabled ACER to identify when limited information was being obtained to address specific key research questions.

For example, ACER worked with the field researchers to add questions to the teacher interview guides to avoid a data gap.

Observations of processes also enabled the ACER team to understand challenges in obtaining informed consent by research participants. This led to the inclusion of standard statements in each country study for researchers to use and an adjustment to include all study participants in official introductions at each school rather than only involving the school leader. This modification helped ensure all participants had the necessary information about the study and the purpose of the interviews.

Documenting field operations issues facilitates ongoing improvement

Documenting the issues and challenges experienced during field operations has enabled the implementation of solutions in following years of the studies in each location. For each study, the method, instrument design, training program, field work protocols and scope of work for the in-country partner organisation have all been refined, based on the experiences during implementation in the first year.

In Timor-Leste, staffing was adjusted in the second year of the study. The Field Coordinator role in the first year was responsible for managing logistics, in addition to conducting interviews. This dual function proved to overburden the individual as it involved multiple, varied and competing demands. ACER consulted with the Field Coordinator, documented their experiences, and modified the terms of reference and team structure.

For the Laos study, refinements were made following the baseline data collection, such as the development of clearer protocols on which interview guide to use depending on the school structure and previous involvement in the baseline study. For example, in some schools the Grade 1 teacher also acted as school principal. In these cases it was left to field researchers to determine overlapping questions and decide whether to go through these questions again or not. One team took that opportunity to dig deeper in the interview whilst another team only focussed on additional questions in the principal interview. For the second year, multiple interview schedules have been prepared in anticipation of the different participant types and these will be made available to researchers so that consistency is achieved across case study locations.

Analysis and reporting of the case study findings

The case study analysis and reporting process varied between the studies, acknowledging the differences in management arrangements, experience of the field researchers in case study methodology, and design of each study.

Review and quality assurance

The purpose of review and quality assurance of data was to ensure that the multiple data sources were complete records (submitted, labelled correctly, and transcribed and translated well). Different processes were used for audio-recording, transcription and translation in each country depending on the English skills of each team.

ACER had the responsibility of quality assuring the data submitted for the Timor-Leste and Vanuatu studies, and in some cases, asked additional questions of the research team to cross-check data and clarify any queries. In Laos, given the different management arrangements, the lead in-country partner was responsible for initial quality assurance.

Analysis

The techniques undertaken to analyse the data also slightly varied between countries, however the process of analysis was similar and involved the following steps:

- Creating a coding framework to structure the themes for analysis
- Systematically organising the data
- Theory building
- Assessing the analysis.

Given ACER's presence in the field during data collection in Timor-Leste and Vanuatu, there was an opportunity to develop the analysis through considering initial concepts and themes. In Vanuatu, some of these themes

were 'tested' with the field researchers towards the end of each provincial field collection. Codes were subsequently created and arranged around the key research questions and emerging themes. The next stage of work involved ACER conducting more detailed analysis of the qualitative data by collating evidence from the case study data against the codes developed.

For the Timor-Leste and Vanuatu studies, ACER used QSR NVivo 12 Pro qualitative data analysis software, to facilitate the coding and analysis process. Important preparatory steps undertaken for this coding process involved the study team familiarising themselves with the material, jointly deciding how the data was to be 'broken down' (e.g., whole paragraphs, sentences, ideas) to ensure the accuracy of inter-rater reliability tests, defining and building a code book, and setting up the NVivo database. Using the software, the study team then coded the text. Ideas and memos were annotated as part of this process.

For the Laos study, the local lead researchers participated in a 2.5 day data analysis workshop one month after data collection, to map the interview and observation data against high-level themes identified by ACER, and aligned with key research questions of the study. In this workshop, the local researchers identified core sub-themes and additional themes and refined them through discussion. Given ACER was not present in the field, these workshops enabled the researchers to supplement their written records with detailed verbal descriptions and contextual data.

ACER opted to undertake manual coding for the Laos study. Key considerations for this decision included the longitudinal nature of the study

design and the broader range of data collected, which included classroom observations. These characteristics gave impetus for the inclusion of more ‘quantitative’ type analysis, including creation of thematic maps, observation maps and counts, which suited a manual process. A primary objective for this baseline study was to create visual displays of the data in an attempt to understand and represent the rich detail, and facilitate the ability to monitor changes over the study period. Nevertheless, the preparatory steps for this process were similar, involving the study team familiarising themselves with the data, building themes and subthemes and descriptions of these, and setting up templates.

The process of analysis was iterative across all studies. Data was re-ordered, codes refined, and key concepts extracted. For each study, the team looked for patterns, which were tested and theories that were further developed.

A final step involved each study team assessing the analysis. This required each team to check if the analysis was reliable (would another researcher reach the same conclusions?) and valid (is there rigour in the analysis?).

Reporting

The approaches to reporting for each study focused on the needs of the target audience, the study design and how to present the range of mixed methods data effectively and clearly. Given the primary audience for each study are policy makers and program implementers, each report was structured by research question, with key findings highlighted in an executive summary and elaborated throughout the report.

The Timor-Leste and Vanuatu studies focused on presenting the experiences of stakeholders in each province, with data such as quotes used to illustrate emerging themes. For the Laos study, given that the design of the quantitative and qualitative data collections were integrated, qualitative data was useful for

triangulating the quantitative results and providing deeper insights into the survey data collected. Visual displays of the data generated through interviews and classroom observations were also presented. These visual displays included, for example, tables with symbols representing presence and absence of an observed or reported event, and tables with colour mapping representing themes evident across locations.

Key lessons regarding analysis and reporting

Involving local researchers and stakeholders in the analysis process

Local researchers and stakeholders were involved in various ways in the analysis process. ACER’s presence in the field during data collection in Timor-Leste and Vanuatu provided the opportunity to ‘test’ themes and undertake initial analysis. Emerging findings from this initial analysis were presented to DFAT at the end of each in-country visit, providing another opportunity to ‘test’ themes, seek stakeholder feedback and insights, and obtain additional information. These findings and observations were included as part of field reports submitted to DFAT.

For the Laos study, the involvement of local researchers in the data analysis workshop provided the opportunity for them to supplement their written records, and for ACER to gather more detailed contextual data than would have been possible if written records alone were analysed by the study evaluation team, as well as ‘test’ themes and subthemes. This process was particularly valuable given ACER was not present in the field.

Another significant benefit of engaging local researchers in the analysis workshop in Laos was the opportunity it generated for researcher capacity building. Researchers were required to ‘dig into their data’, organise their data, and analyse and present their reflections during the workshop.

The researchers reported that they highly valued the experience of participating in the analysis workshop because they learned a lot about analysing data, and found their involvement in this process respectful and

highly motivating. Given this valuable experience, efforts will be made in the future phases of the studies, to continue to involve local researchers in the data analysis process.

Considerations for other programs and contexts

The use of case study methodology provides a rich data source for multi-stakeholder analysis of teacher quality and student learning outcomes in Laos, Timor-Leste and Vanuatu. The descriptions of the case study methods implemented in each country and the key lessons learned to this point, provide useful insights for the future direction of each of these studies, as well as other research studies incorporating case study in their methodological approach.

An important consideration across all three studies is the integration of an adaptive approach at each stage of the case study cycle. Throughout the design, implementation, analysis and reporting processes, the study was refined and adapted to respond to the specific priorities and challenges in each context. This also facilitated opportunities for applying lessons learned across the study series, which led to improved operational efficiencies and enhanced data quality.

A deliberate approach to engage in-country partners early in the design and throughout the implementation phases was also critical in the application of case study methodology. ACER adopted a capacity sharing model with in-country researchers, drawing on their deep knowledge and understanding of the local context to ensure quality of the sampling process, instrument development, and accuracy of data analysis and reporting. While this process was more intensive, the time and resources committed to building the in-country partnerships have created a strong foundation for future phases of the study. This was evident in the context of COVID-19 disruptions, where the in-country research teams were able to continue the data collection process to a high-standard, with remote assistance from ACER.

As the study series proceeds, the evaluation team will continue to reflect and report on lessons learned in relation to case study methods and the implications of these for program evaluations in other contexts.

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About the authors

Elizabeth Cassity is a Senior Research Fellow in the Educational Monitoring and Research Division at the Australian Council for Educational Research. Elizabeth co-leads the Vanuatu and Timor-Leste study components of the DFAT teacher development study series.

Jennie Chainey is a Research Fellow in the Educational Monitoring and Research Division at the Australian Council for Educational Research. Jennie co-leads the Timor-Leste study component of the DFAT teacher development study series.

Hilary Hollingsworth is a Principal Research Fellow in the Educational Monitoring and Research Division at the Australian Council for Educational Research. Hilary is the Principal Technical Advisor for the DFAT teacher development study series, and co-leads the Laos study component of the DFAT teacher development study series.

Debbie Wong is a Senior Research Fellow in the Educational Monitoring and Research Division at the Australian Council for Educational Research. Debbie is the Project Manager for the DFAT teacher development study series, and co-leads the Laos and Vanuatu study components of the DFAT teacher development study series.