THESIS

Evaluating professional development programmes aimed at promoting *Classroom Action Research*: Perspectives from teachers in Indonesia

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October 15, 2022

Declaration by author

I, Ikhsan Abdusyakur, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Acknowledgements

I dedicate my thesis to my wife Difa Adelia and my daughter Isla Hara. Their endless support, love, and patience have always guided me and will continue to do so.

I would also like to express my gratitude to my excellent supervisors Dr. Sara Bubb and Prof. Melanie Ehren.

My deepest appreciation goes to Indonesian Endowment Fund for Education / *Lembaga Pengelola Dana Pendidikan* (LPDP) that have funded my study and to the teachers who agreed to participate in my research.

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ABSTRACT

This is an exploratory study which focuses on exploring teacher perceptions on the impact of professional development (PD) programmes aimed at promoting Classroom Action Research (CAR) that teachers followed in Jakarta, Indonesia. The Indonesian government by means of its education reform policy has been taking measures in promoting CAR to teachers as a way of improving its teacher quality, having two of its measures organising PD programmes about CAR for teachers and providing guidelines for PD programme providers. However, difficulties arose in the implementation as my research found that the quality of PD programmes available to teachers had been poor and without any evaluation process. While it is acknowledged that PD programmes need to be evaluated to ascertain the quality as well as to assess its impact on teachers as the participants, research on the impact of PD programmes about CAR specifically is fragmented and an integrated view on such evaluation is still missing.

My literature review of this study reveals a gap in the existing frameworks for the evaluation of PD programmes about CAR, resulting in the development of the conceptual framework. This framework suggests four research questions in this study, focusing on four levels of impact on PD programmes: teacher experience, teacher learning, changes in teaching practice, and influencing factors. This study tries to answer the research questions by applying a multiple-case study design in three different groups of teachers as participants of three PD programmes about CAR in Jakarta, Indonesia. The data were generated over a period of three months through an observation of all three programmes: a survey of one hundred teachers; interviews with the three programme providers, eleven heads of schools and sixteen teachers; and document analyses. This study demonstrates how the conceptual framework was deductively discussed through the application of case studies and inductively extended through the findings of teachers' perceptions on the impact of the PD programmes about CAR.

The result of the study generates an extended evaluation framework having all four levels of impact in the conceptual framework thoroughly elaborated and expanded in detail. First, there are four structural features and three substance features of the programme which are highlighted to be effective in the discussion of teacher experience on the programme. For example, the features 'time management/duration' and 'trainer/mentor quality' are revealed to be effective in helping teachers during the implementation of CAR. Second, the discussion highlights four specific knowledge and skills in conducting CAR and two specific attitudes towards CAR as the impact of the PD programmes on teacher learning. For example, the findings reveal that several teachers were able to reflect on their previous CAR cycle and to trust the importance of CAR after following the programme. Third, there are two kinds of change in classroom practice, three kinds of change in personal level and two kinds of change in interpersonal level as well as five levels of use of CAR which are highlighted as the impact of the PD programmes on tchanges in teaching practice. For instance, the findings reveal that one teacher had strong will in using CAR and, consequently, sought more effective teaching method and shared the result with the others. At last, the findings highlight the importance of teacher characteristics, school characteristics, and government policy in hindering or helping the impact accounted for as influencing factors. For instance, the characteristic of open-minded and progressive heads of schools provides support for teachers in conducting CAR. On the other hand, the characteristic of a new teacher lacking professional experience and motivation

in following the programme limited his expectations of the programme, and, consequently, the implementation of CAR.

This study aims to help both the Indonesian government and PD programme providers evaluate the impact of PD programmes aimed at promoting CAR on teachers to improve teacher quality through CAR and to identify the key features, expected outcomes of learning and practice and contextual factors that may support teachers in conducting CAR. Accordingly, this study can also be used as a guideline as well as a literature reference for future studies in evaluating the impact of a PD programme aimed at promoting CAR by offering an extensive framework of such evaluation.

IMPACT STATEMENT

This study aims to answer the research questions and make a meaningful contribution to the existing knowledge on the impact of a professional development (PD) programme aimed at promoting Classroom Action Research (CAR) on teachers in Indonesia. This way, it may extend the existing theories on how a PD programme contributes to teaching improvements, specifically by conducting CAR into teachers' teaching practice. The aims of this study are divided into two focuses: (1) conceptually, this study intends to develop a conceptual framework for PD programme evaluation specifically about CAR, incorporating components of PD outcomes or influencing factors that need to be taken into consideration in the evaluation processes; and (2) methodologically, this study intends to propose strategies on how to conduct the evaluation and a set of tools to evaluate the components of the PD evaluation framework. It also aims to help the Indonesian Ministry of Education and Culture (MoEC) and other related governmental and educational institutions to understand the impact of a PD programme aimed at promoting CAR on teacher learning and teaching practice as well as to identify potential features of the programme and factors from schools that support teachers in using their new learning in the classroom. If CAR has positive effect on teaching improvements, it is necessary to find a way to promote this practice. Accordingly, the study may fill a gap in the Indonesian world's literature, as it also contributes to the wider field of PD programmes about CAR around the world. Lastly, it can also be used as a guideline as well as a reference for future studies in evaluating the impact of a PD programme aimed at promoting CAR in other countries by offering an extensive framework of such evaluation.

1 INTRODUCTION

This exploratory study focuses on exploring teacher perceptions on the impact of the professional development (PD) programmes aimed at promoting Classroom Action Research (CAR) teachers followed in Jakarta, Indonesia. In this introductory chapter, the background of the study is explained. This includes an overview of Indonesia's reformed education policy and its initiatives with respect to improving teacher quality through CAR and its PD programmes. This is followed by the rationale, aim and significance, and scope of the study. The motivation for the study is also introduced. This chapter ends with the outline of this thesis.

1.1 BACKGROUND OF THE STUDY

In 2005, Indonesia reformed its education policy by issuing the Law of Teachers and Lecturers No. 14 of 2005 (hereinafter 'Teacher Law'), where such momentum brought around the government to pay more attention to teacher quality (Jalal et al., 2009). The law which includes teachers' professionalism duties of educating, assessing, and evaluating students in academic education regulates teachers' professional competencies required to improve their teaching quality (MoEC, 2015; World Bank, 2020). Such competencies constitute knowledge, skills, teaching practice and conduct for teachers to meet certain quality standards as stipulated by the law (MoEC, 2015).

As part of actualising teachers' competencies, the government added teacher PD activities as one of the requirements for teacher promotion and published its guidelines in the Regulation of Indonesian Minister of Administrative and Bureaucratic Reform No. 16 of 2009 concerning Teacher Functional Position and Credit Score System. Under the regulation, PD activities have credit value for teacher promotion, which means a teacher who is involved in various PD activities may collect such credits to apply for a higher functional rank of career. In this regard, PD activities with credit point are divided into three components: (1) self-development, (2) scientific publication, and (3) innovative works (MoEC, 2015). The component of self-development includes two activities: following a functional training held by the government and participating in teachers' collective activities in regard to improve teacher's competence and/or profession (*e.g.* teachers' workshops, seminars or other scientific forums). The component of scientific publication consists of publishing a scientific paper based on research activities (*i.e.* CAR reports). At last, the component of innovative works is related to teacher involvement in creating or developing school materials, such as efficient technology, teaching props and standards, including expectations that teachers also exercise reform into their teaching practice (MoEC, 2015).

The practice of CAR in Indonesia was first introduced in 1998 through the PGSM (*Pendidikan Guru Sekolah Menengah* or Education of High School Teachers) Project by the Ministry of Education and Culture (MoEC) (PGSM, 1998). In this case, teacher educators from several provincial universities followed a training to become CAR trainers. These trainers then returned to their provinces and trained secondary teachers of CAR in schools (*Ibid.*). Ever since, both in-service and pre-service teachers have been trained and taught about CAR. At the

level of in-service teacher training, CAR becomes one of the compulsory courses in PLPG (*Pendidikan dan Pelatihan Profesi Guru* or Education and Training for Teaching Profession), where teachers are trained to conduct CAR as a way to evaluate and enhance their teaching practice in order to improve their student achievement (MoEC, 2016; Syah, 2016) and a subject in teacher trainings at MGMP (*Musyawarah Guru Mata Pelajaran* or Subject Teachers Conference) forum (Jalal et al., 2009). At the pre-service teacher education, CAR is a compulsory subject at universities in Indonesia (Amri, 2013). Moreover, the reformed policy requires all in-service teachers to hold a bachelor's degree, making CAR under the spotlight as it is the most commonly used approach for completing thesis in the pre-service training (Andriani & Antoro, 2011).

Since January 2013, the government has fully applied teacher ranking system in which the minimum of one CAR report has to be submitted as one of the requirements for all ranks of teacher promotion (Thamrin, 2018), from the lowest of III/a to the highest of IV/e. The report itself must be in a form of a research paper which discusses action research that a teacher conducts in his/her classroom and contains the problem, findings, data used, and action taken by reflecting upon his/her practice.

The government has been taking measures ever since to promote CAR and its PD programmes to teachers. These measures are such as budget allocation, grants, credit points, career promotion, providing government-held PD programmes aimed at promoting CAR to teachers in every province in Indonesia, and designing PD programme guidelines for programme providers such as private institutions and teacher associations, to help guide them through the ideal content of a programme according to the government (Thamrin, 2018; MoEC, 2015). However, these measures still have not shown any significant change towards teachers engaging in CAR.

1.2 RATIONALE OF THE STUDY

Despite the support by the Indonesian government for teachers conducting CAR and following its PD programmes, difficulties still arise in its implementation. Although CAR has become one of the strategies of control in Indonesia through its mandatory use within the accreditation and certification system, a few studies reported that it was uncorrelated with the improvement of teacher quality and student learning outcome (De Ree et al., 2018; World Bank, 2020). There are issues identified by MoEC which include teachers' lack of positive attitude, knowledge and skills, opportunity to practice, and effective PD programmes (MoEC, 2015).

The existence of CAR in Indonesia has been urged by the government to become part of teachers' work and embedded as the central element for teacher promotion since 2009 (Sukidjo, 2014; Ahmad & Setyaningsih, 2012). Nevertheless, the output of teachers engaging in CAR did not seem to yield satisfactory results (Thamrin, 2011). Research shows that there is still a huge percentage of teachers who do not practice CAR (Putriani et al., 2016; Pati, 2014; Sukidjo, 2014; Ahmad & Setyaningsih, 2012; Badrun, 2011). Pati (2014) highlighted the fact that, in comparison, there was a higher number of teachers lacked the necessary qualifications and

training than those who did not. In 2008, Widoyoko (2008) found that many teachers felt incapable, reluctant and apathetic in conducting CAR and this affected their career promotion. Data from MoEC in 2015 showed that out of 2.6 million teachers in Indonesia, 99.04% teachers occupied a low rank (rank I/a – IV/a) due to lacking credit points from submitting CAR reports (Thamrin, 2011).

Beside the attitudes, many teachers still lack basic CAR prerequisite skills, such as problem-identifying, data analysis, and writing skills (Andriani & Antoro, 2011). Interviews with teachers conducted by Sukmayadi et al. (2011) concluded that either much teachers' knowledge of CAR was theoretical or their understanding was incorrect; both of which were caused by the lack of effective PD programmes. This is indirectly in line with my study (Abdusyakur & Poortman, 2019) that showed teachers in Indonesia lacked knowledge and skills in using data (which is the main tool in conducting CAR) to their teaching instructions and practice and lacked training in helping them overcome the problems. In addition, Burns & Rochsantingsih (2006) categorised difficulties teachers faced in the implementation into three categories: 1) general problems, such as time management, limited funds, and work overload; 2) research problems, such as problem formulation, data collection and interpretation, and CAR report writing; and 3) individual problems, such as confidence issues, demotivation, and conflict of the programme with school priorities. Volk (2010) added lack of sustainability of conducting CAR in Indonesia as another major challenge faced by teachers and noted that to promote sustainability, teachers need an on-going support from their heads of schools and a long-term and intensive PD programme.

In Indonesia, although PD programmes have crucial roles in encouraging and supporting teachers to improve teaching practice (Burns & Rochsantingsih, 2006), there are studies undertaken in Indonesia (Andriani & Antoro, 2011; Volk, 2010; Burns & Rochsantingsih, 2006) that identified problems experienced by teachers following a PD programme. Findings of Andriani & Antoro (2011) showed that in the programmes they observed, many teachers lacked coherence and active participation and the programme providers offered too many theories of CAR without encouraging the practice.

The government's initiatives to promote CAR through PD programmes yielded limited success: only a faint number have been delivered (Burns & Rochsantingsih, 2006), the professional management was lack (Bjork, 2004), the quality of the programmes has been poor (Sukmayadi et al., 2011), and skilled trainers were deficient (Evans et al., 2009). The majority of trainers has insufficient expertise and experience in conducting CAR (Milligan, 2011). From teacher perspective, many teachers do not really care about the quality as their only concern is the quantity aspect (number of hours) of the programmes attended, as their attendance is accounted as credits for their career promotion (Setiawan, 2009). Teachers are seen more as passive rather than active in PD and research (Sukmayadi, 2011). A phenomenon occurs in which teachers attend as many training events, seminars and PD programmes as they can afford, despite the slighter if not scarce opportunity for those living in rural areas (Setiawan, 2009). On the other hand, many programme providers, both government and private institutions, try to vary PD programmes through seminars, trainings and workshops without really focusing on the quality of what is delivered. Thamrin (2011) found that in Indonesia,

CAR was still commonly seen as part of teacher training without any follow up of its implementation to the teaching practice. The majority of the existing PD programmes is not effective in improving the quality of teacher (Harjanto et al., 2018) as it models one-shot events without any monitoring or evaluation process. The quality itself may not be up to what is proving to be expected by many teachers.

Despite the above-described problems, it is suggested that CAR has to be continuously introduced and practiced in schools as a PD in Indonesia (Thamrin, 2018). Lim et al. (2009) recommended that programme providers evaluated the effectiveness of their programmes to ascertain the quality and success. Previous research has mapped the possible effects of PD (*e.g.* Van Veen et al., 2012; Desimone, 2009), evaluation models of PD have been developed (*e.g.* Muijs & Lindsay, 2008; Guskey, 2000), research on the impact of PD programmes aimed at promoting CAR is segmented in evaluating the conditions and its impacts and an integrated view on such evaluation is still missing. Some research discussed about the PD initiatives by the government (Hajar et al., 2020; Syah, 2016), some focused on CAR implementation merely from teachers' view (Hartini et al., 2022; Barnawi et al., 2021; Wulandari et al., 2019; Burns & Rochsantingsih, 2006), but none used a framework to investigate. Accordingly, this research aims to address this issue. The practice of CAR is still relatively new in Indonesia and only a number of studies were published in the literature that show how CAR can be used in PD. More research specifically of PD programmes about CAR in Indonesian context is encouraged (Thamrin, 2018). Several studies suggest a construction of a more comprehensive framework to produce data-based decisions about the PD programme evaluation (King, 2014; Desimone, 2009; Borko, 2004; Guskey, 2000). An elaborate study of PD programmes aimed at promoting CAR is required to understand the existing perspectives and outline methods for its improvements, producing an evaluation framework that can be used in research and practice. The framework is explored in more detail in the literature review. Accordingly, this research was produced to identify such issues which was actually set in my home country Indonesia.

1.3 AIM AND SIGNIFICANCE OF THE STUDY

To understand the existing perspectives and outline methods for improvements of the current PD programmes about CAR, my study evaluates its impact on teachers. The aim of this study is: *to explore the impact of a professional development programme aimed at promoting Classroom Action Research (CAR) on teachers in Indonesia.*

This study aims to make a meaningful contribution to the existing knowledge on the impact of a PD programme aimed at promoting Classroom Action Research (CAR) on teachers in Indonesia. This way, it may extend the existing theories on how a PD programme contributes to teaching improvements, specifically by conducting CAR. The aims of this study are divided into two focuses: (1) conceptually, this study intends to construct a conceptual framework for PD programme evaluation specifically about CAR, incorporating components of PD outcomes or influencing factors that need to be taken into consideration in the evaluation processes; and (2) methodologically, this study intends to propose strategies on how to conduct the evaluation and a set of tools to evaluate the components of the PD evaluation framework. It also aims to help the Indonesian Ministry of Education and Culture and its related governmental institutions

to understand the impact of a PD programme aimed at promoting CAR on teacher learning and teaching practice as well as to identify potential features of the programme and factors from schools that support teachers in using their new learning in the classroom. If CAR has positive effect on teaching improvements, it is necessary to find a way to promote this practice. Accordingly, the study may fill a gap in the Indonesian literature, as it also contributes globally to the wider field of PD programmes about CAR in Indonesia. At last, it can also be used as a guideline as well as a reference for future studies in evaluating the impact of a PD programme aimed at promoting CAR in other countries by offering an extensive framework of such evaluation.

1.4 MOTIVATION FOR THE STUDY

In 2015, I conducted a master's dissertation investigating how teachers and heads of primary schools in Indonesia exercised data-based decision making. I concluded that teachers in Indonesia faced many challenges in using data for teaching improvements. The main challenge was that most teachers lacked belief in data use for teaching practice as they lacked receiving any proper PD programmes relating to data use for teaching practice. According to Schildkamp & Kuiper (2010), this condition made teachers lack sufficient knowledge or even did not consider student needs in making their teaching instructions or decisions. One of the interesting findings in my master's dissertation was a misuse of data, where teachers taught according to the test occurred at school. This means teachers narrowed their teaching methods only to what students were assessed in the examination tests. Consequently, teachers did not consider the use of data for instructions based on students' needs, but instead, they taught the test items only for students to achieve higher grades.

The findings from my study (Abdusyakur & Poortman, 2019) that teachers in Indonesia lacked using data for teaching instruction purpose contrasted with what was expected from the Teacher Law and the Regulation of the Indonesian Minister of Education and Culture No. 37 of 2017 Concerning Teacher Certification, which obliged teachers to conduct CAR. By using data that teachers gather and phenomena they observe as a means of informing their instructions, CAR allows teachers to be reflective and critical of their own practice and instructions (Mertell, 2017). My study (Abdusyakur & Poortman, 2019) revealed that teachers in Indonesia did not use data for their teaching instructions, teaching practice and/or teaching improvements, and consequently, practiced improper conduct of CAR. This condition was worsened by the fact that teachers lacked any proper PD programme aimed at promoting CAR. On a personal note, I am not a teacher, a head of school, a trainer, or a government official but this finding intrigued me to discover more about CAR in Indonesia and how this could improve my academic strength. Accordingly, the above discussion draws the motivation of this study: to better understand teachers' values and attitudes in CAR and how that might be explained through centralised approaches of professional development *i.e.* how professional development can create the legitimacy for CAR. This method may help them improve their teaching instructions to overcome their student needs or problems in small scale and improve education in Indonesia in large scale.

1.5 SCOPE OF THE STUDY

The scope of the study explains the extent to which the research area is explored and covered in the work and specifies the parameters within the study focused on (Simon & Goes, 2013). They help shape the researcher's decision in including or excluding certain variables in the study. Below is the scope of this study:

1. This research focused on PD programmes about CAR held on July – November 2018 in Jakarta, Indonesia.
2. I investigated the impact of PD programmes about CAR on teachers only; impact on students were excluded.
3. I found the three PD programmes with the distinct types and models of PD programmes, PD programme providers and the duration of the programme: PD Programme Version I was a coaching/mentoring programme which involved active roles of the participants and continuous learning (three-month) and was held by an independent PD programme provider; PD Programme Version II presented passive roles of the participants (traditional) and was a continuous learning (one-week) and was held by the government (Indonesian Ministry of Education and Culture); and PD Programme Version III is a training programme which required passive roles of the participants (traditional) and was a one-shot learning (one-day) and was held by an independent PD programme provider.
4. Teachers involved in this study are those who followed these PD programmes about CAR and seemed enthusiastic with the programmes, which might result a bias on their views. Each PD programme had different group of teachers as participants.
5. I conducted my interviews within 3-month period.

1.6 THESIS STRUCTURE

This thesis consists of eight chapters. Chapter 1 provides rationales for the study, emphasising issues that teachers experience in regard to their following PD programmes about CAR and implementing CAR into their practice from national perspective and that of this study context. Chapter 2 reviews the relevant literature to this thesis, discussing certain perspectives on teacher professional development, action research, and classroom action research. Chapter 3 represents the methodological framework that I apply to explore the research questions of this study. Chapters 4, 5 and 6 are the finding chapters, which present a case study of each programme by the teachers. In Chapter 7, the discussion of the case studies is presented. The thesis ends in Chapter 8 which consists of the conclusion, limitations and implications of the study, and suggestions for further discussion.

2 LITERATURE REVIEW

This chapter reviews the literature from across the world to analyse what is known about each of the main topics of the study: the impact of a professional development (PD) programme aimed at promoting Classroom Action Research (CAR) on teachers in Indonesia. The first section discusses teacher PD and the reasons teachers participate in PD programmes. It also explains the terms used and their definitions, PD programme approaches and models, the characteristics of effective PD programme, and the development of PD programmes in Indonesian context. The second section discusses CAR and its development in Indonesia. The chapter ends by reviewing the existing models that have been used to evaluate the impact of PD programmes. From this, I develop a conceptual framework and map relationships between ideas and theories to formulate my research questions.

There is a wide range of literature written about PD and CAR. In this chapter, a selection of the literature (mainly empirical) written in English and published by both Indonesian and Western scholars within the last two decades is explored. Some older, but particularly important, literature relating to the research is also reviewed. The key words that I used were as follows: Classroom Action Research(s) AND Teacher Professional Development(s) AND evaluating the impact of a PD programme. The databases that I used were ERIC ProQuest and SCOPUS. I also searched for publications through Google Scholar and the UCL library catalogue using the same or similar key words. This method helps me explore studies published as books or book chapters whose databases, which usually highlight mainly on journal articles, might have missed. I also conducted a literature search by snowballing and tracing the references of the similar publications that I had already looked through general reading on the topic as well as tracing those who cited these publications.

2.1 TEACHER PROFESSIONAL DEVELOPMENT

This section reviews the literature on teacher PD that emphasises the terms and their delineating definitions of PD programme, types of PD programme models and approaches, and effective PD programme. Regarding the latter topic, my intention is to discuss the features of effective PD which may inform this study regarding the impact of a PD programme on teachers. Lastly, the chapter goes on to consider the PD programme in Indonesian context.

2.1.1 Terms used of professional development and their definitions

In the process of searching the literature, I found that an extensive variety of terms is used distinctively and interchangeably in reference to professional development. Such terms used are teacher development (*e.g.* Nias, 2017; Fullan & Hargreaves, 1992) staff development (*e.g.* Bubb & Earley, 2007; Sparks, 1994; McLaughlin & Marsh, 1990) and professional learning (*e.g.* Jensen et al., 2017; Schleicher, 2016; Timperley, 2011, Darling-Hammond et al., 2010; Easton, 2008). These terms encompass a wide range of PD activities in which teachers participate, such as information meetings, study days, staff training days, courses and training events; coaching; mentoring, participation in a network, classroom observations, offsite team

training sessions, book and study clubs; and research projects (Meirink et al., 2012). Bubb & Earley (2009) raise the issue of differing terminology stating that although there may be similarities and overlaps, there are subtle and sometimes significant differences between words among researchers. Their findings emphasised the importance of considering the use of different terminology during research on PD.

There is no clear definition of 'professional development' in the literature (Evans, 2002). However, some definitions emphasise the opportunities for teachers to acquire knowledge and skills with the range of activities. For instance, Kyndt et al. (2016) believe that formal learning, such as PD, is structured and provided various forms of support in terms of time, and outcomes resulting in the development of knowledge, attitudes and skills (p.1113-1114). This is in line with Desimone (2011) who argue that PD is a range of activities that increases knowledge and skills; improves practice and contributes to growth; includes interrelated learning opportunities focused on content, active learning, and participation; and improves academic achievement. It requires a variation of methods, such as action research, seminars, workshops, and conferences (Desimone, 2009). In addition, this PD definition accords with Fenstermacher & Berliner (1983) who state that the focus of PD perspective is on promoting types of learning activities that are effective and efficient for enhancing teachers' knowledge and skills, as they defined PD as:

> The provision of activities designed to advance the knowledge, skills and understanding of teachers in ways that lead to change in their thinking and classroom behavior. (Fenstermacher & Berliner, 1983, p.4).

Some definitions reflect a more comprehensive view on PD which encompass a wide range of learning, including informal and formal learning experiences, done individually or collaboratively (in a group or school development). Starting from Day's (1999) view of PD, that is:

> Professional development consists of all natural learning experiences and those conscious and planned activities which are intended to be of direct or indirect benefit to the individual, group or school and which contribute, through these, to the quality of education in the classroom […] (Day, 1999, p. 4).

In a similar vein, Bubb & Earley (2007) defined staff development as:

> [...] an on-going process encompassing all formal and informal learning experiences that enable all staff in schools, individually and with others, to think about what they are doing, enhance their knowledge and skills and improve ways of working so that pupil learning and well-being are enhanced as a result. (Bubb & Earley, 2007, p.4).

Based on these definitions, PD in its broadest sense refers to the formal and informal supports and activities put in place with the purpose of helping teachers become professionals (Coldwell, 2017), which can contribute to student learning (Durksen et al., 2017). Accordingly, PD is perceived as a significantly critical, essential component of a successful educational system for enhancing the standard of teachers and teaching through professional learning, the effectiveness of the school organisation, and, ultimately, the quality of student outcomes (Borg, 2015).

There is a distinction between 'professional development' and 'professional learning'. Timperley (2011) views the difference between these two terms with regard to teachers' strong motivation in learning by saying that "professional learning requires teachers to be seriously engaged in their learning whereas PD is often seen as merely participation" (p.5). In this case, teachers take more control of their on-going learning, which is derived from their own motivation, compared with PD. In addition, Darling-Hammond et al. (2010) indicate that professional learning is sometimes used to describe changes in practice brought about by PD or learning not formally planned and a product of job-embedded activities that increases teachers' knowledge in ways that supported student learning.

Based on the discussion above, the term 'professional development' in this study is defined as formal PD activities explicitly designed for and provided to teachers with a focus on helping teachers to develop professionally. This definition highlights that teachers can develop their individual expertise through activities that are commonly defined as formal learning activities. By focusing on this explicit definition of PD, informal learning activities in which teachers follow are not included in this study. From here onwards, I use the term 'professional development programme' to signify that the learning experienced by teachers is introduced by others (PD programme providers) set in a form of a programme to teachers "in order to influence their practice" (Timperley, 2011, p.4).

2.1.2 Teacher motivation in pursuing a professional development programme

Teacher motivation is seen as an important factor in helping teachers participate in PD or classroom research engagement (Yuan et al., 2016). It is actually one individual characteristic influencing teachers' engagement (Kennedy, 2005; Opfer & Pedder, 2011) which determines the success and failure of a PD programme (Osman & Warner, 2020). Teachers with a strong sense of motivation to engage in a PD programme are more likely to extend the learning initiated and implement a new teaching practice (Lohman, 2006; Hodkinson & Hodkinson, 2004).

This study identifies factors that are likely to motivate (or demotivate) teachers to become involved in PD as measures of teacher motivation within this context are needed (Thamrin, 2018). Below are the brief explanations.

1. Intrinsic motivation

The first reason is associated with internal motives. Intrinsic motivation is associated with teachers' willingness to engage in a PD activity for their own sake (Schunk et al., 2012) and with delight and interest (Roth, 2014; Deci & Ryan, 1985). Scribner (1999) indicates four factors that motivate teachers to learn: 1) to meet content knowledge needs; 2) to improve pedagogical skills; 3) to identify classroom management challenges; and 4) to extend student-centered knowledge. In line with Scribner, Guskey (2002) claims that the need to become a better teacher motivates teachers in participating a PD activity as they can improve their skills

and knowledge, resulting in the increase of their competence and professional growth of their teaching practice. Participations with intrinsic motivation yield more positive impacts and successful learning outcomes amongst teachers (Hiew & Murray, 2021). By participating in a PD activity, teachers are allowed to constantly improve and gain new pedagogical knowledge and skills (Richards et al., 2005). For example, a study by Hynds & McDonald (2009) in New Zealand investigated 68 teachers' reasons to participate in a PD project at a school-university partnership PD programme. The study reported that the teachers' main motive in participating was mostly for intrinsic reasons, such as to increase their students' learning, to join in collaborative projects, and to assimilate the theory and its practice. Another study is by McMillan et al. (2016) who investigated teachers' motivating and inhibiting factors and found that among the main factors are teachers' personal interest in PD and the need for teaching practice improvement.

2. Extrinsic motivation

The second reason for teachers engaging in PD is linked with external motives. Scribner (1999) finds that teachers' motivating factors to participate in PD are remuneration and licensure requirements, such as for career development, prestige, income and job satisfaction (Craft et al., 2000). McMillan et al. (2016) inform that extrinsic factors, such as school policy about PD and peer feedback, and PD being compulsory are deemed to facilitate teacher motivation for engaging in professional learning. Similarly, Heystek & Terhoven (2015) explain that heads of schools' support in acknowledging teachers' effort in PD and informing PD through a democratic approach positively motivates teachers to participate in PD programmes. These studies, taken together, suggested the significant role of PD programme providers in considering teacher motivation, so that teachers may implement their learnt knowledge, skills, and meaningful attitude acquired during their PD programme. As Guskey (2002) argues, many PD programmes fail because they do not consider "what motivates teachers to engage in PD" (p. 382).

2.1.3 Types of professional development approach

There is a wide range of research in relation to the approaches towards teacher PD. These approaches explain how PD programmes are organised. An attempt to elaborate various kinds of approaches is laid out in the following discussion, *i.e.* formal PD and informal PD; traditional form of PD and innovative form of PD; one-shot PD and continuous PD; and professional learning communities.

1. Formal and informal professional development

The first approach of PD discussed in the literature is formal PD. Formal PD involves teachers participating in organised activities with appropriate content and where attendance is of evidence (Jones & Dexter, 2014). Nowadays, these activities can be followed face to face (offline) or online. The examples are seminars, workshops, training courses, panel/group meetings, and conference. Formal PD inherently possess temporal and geographic related

difficulties (Kirkwood et al., 2009; Plair, 2008). However, formal PD experiences are often constrained to a specific period and lack the ongoing support teachers require (Mackey & Evans, 2011) and their timing may not always align with when teachers need the instruction. On the other hand, informal PD. In my study, I am interested in what is meant by formal PD.

Beside formal PD, there is also informal PD which involves activities done by an individual teacher and not organised by a party or institution (Evans, 2019; Jones & Dexter, 2014). It is teacher-initiated, be it individually or collaboratively (Jones & Dexter, 2014). The examples can be researching literature via the internet, reading or reviewing books or articles for professional purposes, mentoring, peer review, and doing professional research. These individual activities are considered as personal study or personal research.

2. Traditional and innovative forms of professional development

The next approach of PD discussed is the traditional form of PD. 'Traditional' refers to the way PD was organised for the last decades: mainly through lectures, one-day workshops, seminars and conferences, which were not situated at the workplace, in which teachers played a passive role, and the content was not adjusted to the problems and issues in the daily teaching practice (Meirink et al., 2012). Johnson (2009, p.25) considers that this PD type is "something that is done by others for or to teachers". It has been labelled as "overly fragmented, not connected closely enough to classroom practice" (Borko et al., 2010, p.548). Widodo et al. (2006) in their study argue that traditional PD programmes whose the PD subjects, strategies, instructors, and time are predetermined by the programme providers is not likely to change teaching practice despite the presence of teacher participation. Trainers have designed and delivered short-term PD programmes without underlying the training on specific knowledge occuring in their participants' classrooms and little or no follow-up.

Another PD approach is teachers play an active role (innovative form), and the issues in their own teaching practice determine the content (Meirink et al., 2012). Dikilitaş (2015) argues that this type of PD encourages teachers to "research their own practice, understand more about their own classroom context, and come to a stage where they make informed decisions for development or change in the existing practice" (p.48). It is located in teachers' own classroom, which increases teacher autonomy and ownership over their learning and consequently makes this PD transformational (Kiely & Davis, 2010). Learning opportunities can be accommodated through various forms of classroom inquiry, having one of them is through action research (Burns, 2010). Some examples are collaboration of colleagues, study and book clubs, mentoring, coaching, and research by teachers (Meirink et al., 2012).

3. One-shot and continuous professional development

In addition to the above-mentioned approaches, there are also one-shot PD and continuous PD. One-shot PD is the most common PD that is taken by teachers one time without any follow-up (Guskey, 2000). In the form of one-off workshop, one-shot PD offers information, new ideas, and practical advice where teachers are expected to apply the new knowledge to their

classrooms (Borg, 2015). However, one-shot PD is deemed ineffective as the learning process does not take place in the teachers' classroom but relying on the outsider expert. It is also widely criticised to be course-focused, input-based, externally-defined, deficit-oriented, one-way knowledge transmission, and lack long term objectives and impact on teaching practice (Borg, 2015; Atay 2008; Burns, 2009; Guskey, 2000).

Continuous PD refers to the ongoing learning and development of teachers – embracing both personal and professional development (Brijkumar, 2013). Accordingly, continuous PD is perceived as a significantly critical, essential component of a successful educational system for enhancing the standard of teachers and teaching through professional learning, the effectiveness of the school organisation, and, ultimately, the quality of student outcomes (Borg, 2015). It is through PD activities that teachers may improve their knowledge and skills and, thereby, enhance their teaching and learning in the classroom (Bubb & Earley, 2007).

4. Professional learning communities

A professional learning community (PLC) is a group of teachers that meets routinely to work collaboratively and share their expertise with each other for the improvements of their teaching practice and student performance. These collaborative interactions create a relationship among the teachers over time (Lave & Wenger, 1991), developing a foundation of job-embedded PD that make PLC an impactful school improvement strategy (Roy & Hord, 2006). PLC centered its nature of work in problem-solving and learning from experience (Tennant, 2019). Senge (2012) specifies the concept of PLC by stating the importance of schools developing a learning community rather than teachers working in a highly fragmented world of their courses, their skills, and their students. Stoll & Kools (2017) argue that the concept of the school revolves around the perspective of community as a learning organisation.

Community action research challenges producing practical knowledge useful to teachers' everyday teaching conduct. It focuses on maintaining relationships and collaboration among teachers, setting collective reflection that helps teachers to 'see themselves in one another', and influencing individual progress through cross-institutional links so as to extend transformative changes that might otherwise dissolve (Senge & Scharmer, 2008).

A PLC is similar to "Community of Practice" (CoP). Both are used by schools to build collegiality, help with isolation, maintain collective learning and school change, and create sustainable change (Blankenship & Ruona, 2007). However, these two concepts vary distinctly in terms of membership, leadership, and knowledge sharing. A PLC focuses more on student needs and increasing student achievement by building a culture of collaboration that would lead to school improvement. On the other hand, a CoP focuses on teaching practice improvement by aligning the CoP to the school strategy. Finally, PLC is more likely to highlight the role of the head of school as the leader of the community, while CoP embraces the leadership from within the community.

Summary of professional development approach types

Based on the review above, types of PD programme in practice range from formal to informal, traditional to innovative, one-shot to continuous, and professional learning communities, although however, the concept of CAR demands a continuous PD where teachers involve as active participants (innovative form) in both formal and informal PD as these types enable teachers to examine and improve their own practice and become active learners (Meirink et al, 2012). In addition, it encourages teachers to continuously learn in their own context through interaction with their students and their colleagues (Beck et al., 2020). The existence of PLC also supports the concept of CAR, although this research only focuses limitedly on PDs. This is further discussed in the chapter later.

2.1.4 Models of professional development

Unlike the types of PD, the models of PD explained the distinct purposes of PD programmes. The models of teacher PD are always evolving and competing. Kennedy (2005) identifies models of continuous PD as an attempt at identifying key characteristics of its different types with the aim of enabling deeper analysis of, and discussion about, fundamental issues of purpose, and thus, the nine models as not necessarily exhaustive or exclusive. She considers the circumstances in which "each particular model might be adopted and explored the form(s) of knowledge that could be developed through the particular model" (p.337). The models are the following:

1. **The training model**, which is universally recognisable (Kelly & McDiarmid, 2002; Little, 1994) and arguably the dominant form for teacher PD. It is a type of PD that is commonly delivered off-site by an expert to teachers, with the agenda determined by the deliverer. In this model, teachers become passive participants, which points that the model arguably fails to impact upon in any significant way is the manner in which this new knowledge is used in practice. The model possesses a high degree of central control, often veiled as quality assurance, where the focus is firmly on coherence and standardisation. According to Kennedy (2005), it is compatible with, although not always related to, the standards-based model where teachers make efforts to gain particular skills according to the national standard. Despite its lack, the training model is an effective tool for introducing new knowledge to teachers (Hoban, 2004).
2. **The award-bearing model** offers award-bearing PD programmes whose study completion is validated by an external factor, usually but not exclusively by universities. This validation may point to the quality assurance feature, but equally can also be viewed as the exercise of control by the validating and/or funding bodies.
3. **The deficit model** designs PD that identifies perceived deficit or weaknesses in teacher performance, which indicates government intervention (Rhodes & Beneicke, 2003). However, such performance requires an external factor to evaluate and manage teachers' performance change and remedy such perceived weaknesses if any. What is not always clear to Kennedy (2005), however, is "what the expectations are for competent performance, and whose notion of competence they reflect" (p.340).

4. **The cascade model** involves teachers cascading or sharing the information they receive while following PD programmes to their colleagues. It is usually employed in situations where resources are limited. However, Day (1999) conducted a study to a group of teachers sharing their own (successful) learning with colleagues, and the findings revealed that although they reported what they learnt, "no detailed consideration was given to the very principles of participation, collaboration and ownership which had characterised their own learning" (p.126).
5. **The standards-based model** constitutes teachers striving to gain particular skills set by the national standard. It provides a common language, making it easier for teachers to engage in dialogue about their professional practice. It focuses on the individual teachers' competence and resultant rewards albeit sacrificing teachers' collaborative and collegiate learning. According to Beyer (2002), the model "represents a desire to create a system of teaching, and a system of teacher education, that can generate and empirically validate connections between teacher effectiveness and student learning" (p.243), yet belittles the notion of teaching as a complex, context-specific political and moral endeavour (Kennedy, 2005). There is a capacity in this model for PD and to provide a common language which may improve dialogues between teachers, but these advantages are tempered by this stardardised acknowledgement which renders teaching conceptions unnecessary for teachers to consider the alternatives out with those promoted by the standards.
6. **The coaching/mentoring model** is characterised by the one-to-one relationship, generally between two teachers, which is designed to support the teacher PD. However, Rhodes & Beneicke (2002) add that coaching is more skill-based and mentoring involves an element of 'counselling and professional friendship' (p.301) which also often implies a relationship where one partner is novice and the other more experienced (Clutterbuck, 1991). The relationship of mentoring or coaching is more likely to be hierarchical although it can also be collegiate, like peer coaching. In this model, professional learning is more likely to take place within the school context and be improved by having a shared dialogue with colleagues. In this model, the quality of interpersonal relationships is also crucial. Rhodes & Beneicke (2002) supported this notion that for a successful coaching or mentoring, participants must have well-developed interpersonal communication skills.
7. **The community of practice model** commonly consists of more than two persons participating with no reliance on its confidentiality. It is important for participants to have an awareness of the existence of the community in their internalisation of such learning. In this model, learning can be either a positive and proactive or a passive experience as each member has a role, where the collective wisdom of dominant members of the group shapes other individuals' understanding of the community and its roles. The communities can be powerful transformation sites under certain conditions that collective endeavour remarkably improve the total of individual knowledge and experience.
8. **The action research model** involves the participants themselves as researchers to enhance the quality of action within the research. The 'quality of action' can be seen as the participants' understanding of the situation, as well as the practice within the situation. Research has found that action research is a successful PD tool inquiry and reflection that improve change in teachers' practice at school (Wigglesworth & Murray, 2007; Smith, 2005; Levin & Rock, 2003; Zeichner, 2003; Zamorski & Bulmer, 2002; Neapolitan, 2000;

Rosaen & Schram, 1997). Weiner (2002) and Burbank & Kauchak (2003) argue that when action research is shared in communities of practice or enquiry, it has a greater impact on practice, and resulting more practice communities engage in it.

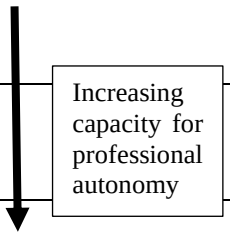
9. **The transformative model** has no clear definition in literature although it acknowledges certain conditions considered as transformative practice. The key characteristic according to Kennedy (2005) is "its effective integration of the range of models described above, together with a real sense of awareness of issues of power, *i.e.* whose agendas are being addressed through the process" (p.347). While there is not much example of this model in evidence except for limited small-scale research activities (Nieto, 2003), it features increasingly in academic literature.

Each of the above models describes the dominant characteristics of particular approaches to continuous PD and it is not necessarily suggested to stand alone. What is critical to the above discussions according to Kennedy (2005) is not only "the obvious structural characteristics, but also the underpinning influences, expectations and possibilities" (p. 348).

The perceived purposes of continuous PD link to education and schooling reforms (Little, 1994). It can help teachers improve the requisite skills to carry out the reforms or to spread, contribute to and give critique of the reforms themselves (Kennedy, 2005). Little (1994) considers that because PD is commonly used as a tool of reform or policy changes, this may raise issues about the fundamental purpose of the activity. She suggests that one test of PD is "its capacity to equip teachers individually and collectively to act as shapers, promoters, and well-informed critics of reforms" (Little, 1994, p.1). These two distinct purposes of continuous PD utilise different models of PD. Continuous PD designed to help teachers contribute to and shape education policy and practice would naturally align with the action research and transformative models, and on the other hand, the coaching/mentoring model, the standards-based model and the community of practice model are defined as 'transitional' due to encouraging agendas match with either of these two purposes of PD. Table 1 below presents the models categorised.

Table 1. Kennedy's (2005, p.236-247) spectrum of continuous PD models

Model of Continuous PD	**Purpose of Model**
The training model	Transmission
The award-bearing model	
The deficit model	
The cascade model	
The standards-based model	Transitional
The coaching/mentoring model	
The community of practice model	
The action research model	Transformative
The transformative model	



In addition to Kennedy's work, there are five sets of PD models developed by other researchers reviewed by Boylan et al. (2018) that might be thought of as general models of professional learning due to the wide applicability: (1) The PD models of Guskey (2002) and (2) Desimone (2009) are identified as influential linear pathway models that focus on single pathways, because their focus is on impacts of professional learning on knowledge instruction, student achievement, and teachers' attitudes and beliefs; (3) Clarke & Hollingsworth's model (2002) is identified as a multiple pathway model *i.e.* the interconnected model of teacher professional growth, because they address the relationship between teachers' beliefs and practice and the influence of the stimuli for learning in different ways and to different extents. (4) Opfer & Pedder's model (2011) is identified as a systemic conceptualisation – a system model which aim to model the complexity of professional learning processes; and (5) Evans' (2014) is identified as a model that aims to theorise the individual micro-level processes of professional learning, having this particular example being a cognitive learning model.

Regarding the above explanation of PD models, it is crucial to note that the PD meant in this study rests on transmission view and linear pathway because: 1) teachers in this study played a passive role in their learning process throughout the PD programmes; and 2) the PD programmes aligned themselves with the government's reform policy and were designed to merely prepare teachers in its implementation. Nevertheless, these programmes aimed at producing teachers capable of conducting CAR, so that in the future, teachers may shift from transmission to transformative view where they have autonomy on their own PD by conducting CAR. Unfortunately, this study rests its discussion on the impact of the programmes without any further assessing whether teachers have shifted to using CAR as a form of PD.

2.2 CLASSROOM ACTION RESEARCH

An overview of action research is presented in this section. It highlights the history of action research, the nature of action research and identified types of action research and action research as an option of teacher PD. Finally, the development of action research in Indonesia was also presented in this review.

2.2.1 Term used and the definition of action research

The concept of action research by Kurt Lewin in 1945, was described as a cycle of planning, acting, observing, and reflecting and using it for initiating changes in social practice (Hinchey, 2008). In 1953, Stephen Corey from the United States considered that teachers were capable to advance their professionalism and status by improving their teaching practice through action research that he experimentally applied the concept in educational settings to enhance curriculum, supervision, and instruction by working with teachers, heads of schools, and supervisors in school districts (Hinchey, 2008). Corey's track in educational action research was followed by Lawrence Stenhouse from the United Kingdom in the 1960s (Holly, 1991). Stenhouse (1975) who coined the term teacher-as-researcher projected each classroom as a laboratory and the teacher as a researcher with the aim of improving their teaching practice in a critical and systematic way. Stenhouse (1975) saw reflexiveness through action research as

the key to school development and the need to be reflected in each school's in-service training programme.

There are many perspectives on educational action research. Many books on action research have been published that are especially valuable in the educational field (McNiff, 2010; Pine et al., 2009; Hopkins, 2008). Some advocate it for professional development, some for knowledge creation, some view it is a special research paradigm (Pine et al., 2009), a methodology of research (Noffke & Somekh, 2009), or an orientation towards research (Reason & McArdle, 2008), but all stress that it needs to result in improvement of teaching practice. I see these perspectives beneficial as they all point out a valuable aspect of action research. In the general sphere of education, the goals of action research for teachers vary, as reflected by its definitions, as proposed by several authors. In addition, its definition is characterised by different types: scientific or technical action research, practical-deliberate action research, and critical-emancipatory action research (Carr & Kemmis, 2003). Moreover, according to Hendricks (2009) action research can be divided into four types: collaborative, critical, classroom, and participatory action research.

My study focuses on Classroom Action Research (CAR) in the form as classroom and practical action research. This implies the rationale for teachers engaging in CAR, that is to enhance classroom teaching practice quality and generate its effectiveness in their own classrooms, schools, or other educational settings (Mertler, 2017). CAR is considered a practical option for teachers overcoming classroom and school-based issues (Mertler, 2017). Practical action research is defined as "research conducted by teachers as they go about their daily work. It is enmeshed in the context of the classroom" (Manfra, 2009, p.38). Johnson (2008, p.28) defines this as "the process of studying a real school or classroom situation to understand and improve the quality of action or instruction". Hendriks (2009) defines CAR as a process of inquiry or reflection exercised by teachers through analysing teaching and learning problems in their own classroom for teaching practice improvement in a cyclical series of systematic action and reflection. This CAR definition signifies the nature of the action research type that is practiced in the Indonesian context. Congruent with this definition, a study by Eliawati & Harahap (2019) in Indonesia point out that CAR helps teachers solve problems met in the classroom and focus on things that happened in the classroom. They said teachers who had started doing CAR in their classes increasingly saw how big the gap between idealism as a good teacher and their daily practice in the classroom.

2.2.2 Type of action research models

There are numerous models of action research, ranging from simple to complex, presented by authors and researchers (Mertler, 2009). However, all models have adopted the same process namely the "cyclical" process (Johnson, 2008). Typically, there are four steps in each cycle: planning, collecting evidence, taking action, and reflecting (Burns, 2010; Nunan & Bailey, 2009; Richards et al., 2005; Mertler, 2009), and if necessary, proceeding to the next action until the goal of improvement is achieved.

In the Indonesian context, Kemmis & McTaggart's (1988) model is exceedingly popular among teachers and most literature about CAR in Indonesia is based on this model. It consists of four main spiral processes of planning, observation, action, and reflection in which teachers needed to: build a critically informed action plan to improve what is already occurring; implement the plan; observe the effects of its occurrence, and reflect on these effects as the basis for further planning, and so on (Kemmis & McTaggart, 1988). This model is presented in the following figure.

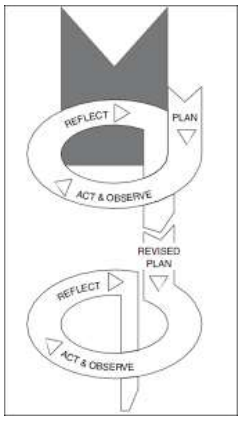


Figure 1. Action research spiral model of Kemmis & McTaggart (1988)

2.2.3 Action research as a form of professional development

The existence of action research is deemed as an improvement to alternate the traditional one-shot, top-down professional learning model deemed insufficient for teachers' professional learning as it merely offers limited opportunities for critical reflection and action (Martell, 2014) without providing enough time, activities or content to improve teachers' knowledge or change their practice, being ineffective, boring, and irrelevant as well as the likelihood of teachers forgetting what they learnt (Burbank & Kauchank, 2003).

Research studies have detailed the impact of undertaking action research as a form of PD. It comes to a result that action research as a form of PD yields teaching practice improvement through learning from and systematically observing their professional growth (Johnson, 2008). These opinions imply that the nature of teaching involves teachers in problems, which leads them to undertake further investigation to find better solutions.

The use of action research as a PD tool is also used to promote teachers being reflective on their teaching practice (Latief, 2009). Mertler (2009) interprets that reflection has become a crucial part of action research as one of the basic principles in conducting action research that it relates to examining teachers' own practice (Mann & Walsh, 2017; McNiff & Whitehead, 2011; Burns, 2010; Kemmis & McTaggart, 1988). According to Burns (2010), reflection in action research has to be present in any stage of the inquiry process, although she suggests the

reflection stage only occurs in the end of action research cycle. The reflection process takes place when teachers pose questions, such as "What am I doing? What do I need to improve? How do I improve it?" (McNiff & Whitehead, 2011). Burton (2015) and Mann & Walsh (2017) complimented the concept that teacher reflection could be more powerful when it was conducted in a collaborative manner, as it involved dialogues with peers, or more experienced colleagues, mentors or teacher educators. Mann & Walsh (2017) argued through a dialogue reflection, "it allows for clarification, questioning, and ultimately enhancing understanding" (p.33).

In addition, several studies discussed the impact of action research on teacher professional autonomy (Jaipal & Figg, 2011; Fazio & Melville, 2008; Gewirtz et al., 2007; Kennedy, 2005; Lyle, 2003; Fazio & Melville, 2008; Jaipal & Figg, 2011). Kennedy (2005) discusses the significant capacity of action research as a model to develop professional autonomy. It improves teachers' consciousness and professionalism (Gewirtz et al., 2007), encourages reflection and consequent changes to teaching practice, enables teachers to become more autonomous in their judgements (Lyle, 2003), and enhances their self-confidence in their own judgements and in themselves (Jaipal & Figg, 2011; Fazio & Melville, 2008; Jaipal & Figg, 2011).

Although the above discussion identified factors with positive impact relevant to teacher learning and development, these strategies may not arguably be successful for all teachers. It was not the view of all teachers and the literature showed that the process and practice of CAR in schools revealed several complexities for teachers. Numerous studies have showed problems in using CAR. Hathorn & Dillon (2018) address issues like time-consuming, lack of administrative support, a feeling that it was a waste of time and not tailoring teachers' needs, disorganised, and personally demanding. Mitton-Kükner (2016) reveals that workshop attendance, staff meetings, and day-to-day routines may avoid the practice of CAR and it can be difficult for teachers to engage in work-related conversations due to time constraints, which is actually necessary in CAR. Evidently, a study conducted by Peters (2004) showed that there were several teachers arguing the value of CAR as a useful process and doubting the stage of reflective writing; Warrican (2006) found that teachers felt obliged to conduct CAR due to lack of time or knowledge and their objection to replace teaching time for research purposes; and James & Worall (2000) revealed that negative views brought out at a school even after ten years of engagement in research. From the action research studies as presented above, it appears that teachers experienced both benefits and challenges related to action research engagement. However, it is likely that only teachers who receive a range of support and effective PD are able to continue practicing action research. Meanwhile, those who are not and striving with contextual issues, finds it challenging to engage further. Given this fact, this study seeks to explore the impacts of teachers in Indonesia following a PD programme about CAR.

2.3 CLASSROOM ACTION RESEARCH IN INDONESIA

The practice of CAR was officially introduced in Indonesia in 1998 through the PGSM Project (*Pendidikan Guru Sekolah Menengah* Project or Education of High School Teachers Project) by MoEC (PGSM, 1998). Moreover, the new policy requiring all in-service teachers to earn a

bachelor's degree places more attention on CAR as it is the most commonly used approach in pre-service training for completing the thesis (Andriani, 2011).

2.3.1 Classroom action research practice as one of Indonesia's reformed education policies

In the Indonesian context, teacher professionalism is rooted by national laws regulating the competence of teachers in conducting their role and function at school and in society context. The Law of Teachers and Lecturers No. 14 of 2005 (hereinafter 'Teacher Law') as an education reform tool obliged teachers to have adequate professional education and meet the quality standards. Teachers are required to obtain certain knowledge, skills, and teaching practice as a set of competence. Following the launching of Teacher Law, teacher quality improvements have been in the spotlight of the Indonesian government (World Bank, 2020; Jalal et al., 2009).

Under Teacher Law, a key reform requires teachers to have academic qualification of a minimum bachelor or four-year diploma level of academic education in accordance with the type, level, and formal education units in where the teaching assignment is (Thamrin, 2018). Teachers without such a degree, commonly primary school teachers, are financially supported by the government to upgrade their qualifications under the teaching qualification upgrade programme. MoEC reported that more than 54% of a total of 2,603,650 teachers in Indonesia were underqualified or did not hold a bachelor's degree qualification, 31% were classified as qualified but not certified, and only the remaining 15% were deemed qualified and certified (Setiawan, 2009). This total number of teachers has risen to almost three million in 2012, and the number of underqualified teachers is 51% (Adhi, cited in Hajar, 2017).

Another key reform requires all teachers to be certified. Teacher certification policies are supported by the school-based management under the regional autonomy scheme as stipulated in Government Law No. 22 of 1999 and No. 32 of 2004, which puts local governments or district administrations in particular at the heart of basic education service delivery (World Bank, 2020; Bjork, 2006). Teacher certificate is evidence of formal recognition given to teachers as professional educators by the government (Harjanto et al., 2018). To be certified, a teacher must have a university degree, required credits from training, and a minimum of 24 hours teaching per week (World Bank, 2020). The government provides extra allowances for teachers who have gained "certified" status that effectively double their salary (World Bank, 2020), and those who are qualified receive this remuneration plus their main salary. As a result, teachers were prompted in completing the required four-year degree causing a significant increase of certified teachers to 63% in 2012 (compared to 23% in 2005) (World Bank, 2020). In fact, 2.7 million teachers were certified by 2015. However, a few studies reported that this government initiative did not increase teachers' quality and student learning outcomes (World Bank, 2020; De Ree et al., 2018; Harjanto et al., World Bank, 2020). Instead, teacher certification in Indonesia has driven teachers "to aim for quantity, that is numbers of hours of training completed at top-down, one-shot PD activities outside schools that increase the points they collect for their portfolios" (Halim, 2011, cited in Hajar, 2017 p.35).

To enhance teachers' competence, the government has also laid down guidelines regarding teacher PD as stipulated in Regulation of Indonesian Minister of Administrative and Bureaucratic Reform No. 16 of 2009 concerning Teacher Functional Position and Credit Score System. In this regulation, a teacher involved in various PD activities may accumulate credits to be used to apply for a particular functional rank. Such ranks are stretched from the lowest of III/a to the highest IV/e, which are categorised as follows: 1) novice teacher (rank III/a and III/b); 2) junior teacher (rank III/c and III/d); 3) intermediate teacher (rank IV/a to IV/c); and 4) senior teacher (rank IV/d and IV/e). There are three components of continuous PD under this regulation: 1) self-development, 2) scientific publication, and 3) innovative works (MoEC, 2010). 'Self-development' refers to teachers following education and training and involving in teacher collective activities. 'Scientific publication' refers to teachers publishing paper(s) based on research activities (*i.e.* CAR). At last, 'innovative works' refers to teacher involvements in creating or developing materials, such as art, efficient technology, and teaching aids, which include the guidelines or standards (MoEC, 2015).

Following the Teacher Law and the components mentioned above, CAR has become one of the requirements for teacher promotion (Shaik-Abdullah et al., 2020). Since January 2013, the government regulates the ranking system in which teachers are required to submit CAR report(s) for a particular rank. For instance, a "novice teacher" with a rank of III/b wanting to obtain a higher rank of III/c as a "junior teacher" is obliged to obtain three credit points of PD activity under self-development and four credit points of PD activity under scientific publication, which is one CAR report, to the government. The report itself has to be in the form of a research paper which discusses action research that the teacher conducts in his/her classroom containing the problem, findings, data used, and action taken by reflecting upon his/her practice. At last, the teacher needs to present the research in a seminar held by the school and attended by at least 15 teachers from three different schools of the same level and the CAR report must be kept in the school library accessible to all teachers (MoEC, 2015).

The government has been taking measures ever since to promote CAR and its PD programmes to teachers. The first measure is that since 2015, the government gives a budget allocation for schools whose teachers follow a PD programme and grants and credit points for the teachers (to be used for career promotion as previously explained) (Shaik-Abdullah et al., 2020). For instance, the government in 2015 funded 168 teachers throughout the nation whose proposals were awarded such grants (MoEC, 2015). Unfortunately, the grants were limited for only one or two teacher(s) from each education level in each province per year (Thamrin, 2018). The second is that the government organised PD programmes about CAR for teachers in every province/region and made the programme guidelines for programme providers such as private institutions and teacher associations, to help guide them through the ideal content of a programme (MoEC, 2015). Commonly, the nature of government-held PD programmes is formal, cost-covered, and aimed at limited participants, while the nature of programmes held by private institutions and teacher associations are less formal, self-initiated or invited and partially self-funded (Widodo & Riandi, 2013).

2.3.2 Arising issues of the implementation of classroom action research and its professional development programmes

The establishment of CAR as PD is indeed growing in Indonesia and has triggered efforts to promote it such as the support by the Indonesian government for teachers conducting CAR and following its PD programmes, rising numbers of conferences, published books about CAR, conference proceedings, workshops and courses for in-service and pre-service teachers (Shaik-Abdullah et al., 2020). Attempts were made to include CAR as compulsory courses for undergraduates and postgraduates respectively, and recently, university-school collaboration was found to be promoted in Indonesia (*Ibid.)*. Sadly, difficulties still arise in its implementation as it is uncorrelated with the enhancement of teacher quality and student learning outcomes even though CAR has become one of the strategies of control in Indonesia through its mandatory use within the accreditation and certification system (World Bank, 2020).

The government's measure to promote CAR through PD programmes has limited success: only a few have been delivered (Burns & Rochsantingsih, 2006), many have not been professionally managed (Bjork, 2004), the quality has been poor (Sukmayadi et al., 2011), and lack of adequately-trained trainers (Evans et al., 2009). Many trainers lack the expertise of CAR and most have no experience in conducting CAR (Milligan, 2011). On the other hand, many teachers do not really care about the quality of the programme as their only concern is the quantity aspect (*i.e.* number of hours) of the programmes attended, as it is accounted as credits for their career promotion (Setiawan, 2009). Teacher's role in PD and, indeed, in research was seen as a passive rather than an active one (Sukmayadi, 2011). A phenomenon occurs in which teachers attend as many training events, seminars and PD programmes as possible, even though for those who live in rural areas, the opportunity is very scarce (Setiawan, 2009). On the other hand, many programme providers, both government and private institutions, try to vary PD programmes through seminars, trainings and workshops without really focusing on the quality of what is delivered. Thamrin (2011) found that in Indonesia, CAR was still commonly seen as part of teacher training without any follow up of its implementation to the teaching practice. The majority of the existing programmes are one-shot events without any monitoring or evaluation process. The quality of PD programmes available to teachers may not be up to what is proving to be a difficult task for many teachers.

Issues faced by teachers in conducting classroom action research

There are issues faced by teachers in regard to the implementation of CAR, which include teachers' lack of positive attitude, knowledge and skills, motivation (Widodo & Riandi, 2013), opportunity to practice (Zein, 2016; Luschei & Zubaidah, 2012; Supriatna, 2011), effective PD programmes (MoEC, 2015), and collaboration among teachers (Hajar et al., 2020; Thamrin, 2011; Burns & Rochsantingsih, 2006). Each issue is briefly discussed below.

1. **Lack of Positive Attitudes** - The existence of CAR in Indonesia has become part of teachers' work and embedded as the central element for teacher promotion since 2009 (Sukidjo, 2014; Ahmad & Setyaningsih, 2012). However, the output of teachers engaging

in CAR did not show satisfactory results even after a few years of implementation (Thamrin, 2011). Research found that there are still a huge percentage of teachers who do not practice CAR (Putriani et al., 2016; Sukidjo, 2014; Pati, 2014; Ahmad & Setyaningsih, 2012; Badrun, 2011). Many teachers feel incapable, reluctant and apathetic in conducting CAR (Widoyoko, 2008) and this affects their career promotion (Nurhasanah et al., 2020). Data from MoEC in 2015 showed that out of 2.6 million teachers in Indonesia, 99.04% teachers occupy low ranks (rank I/a – III) due to lacking credit points from submitting CAR reports (Thamrin, 2011).

2. **Lack of knowledge and skills** - Beside the attitudes, many teachers still lack basic CAR prerequisite skills, such as problem-identifying, data analysis, and writing skills (Nurhasanah et al., 2020; Andriani & Antoro, 2011). Interviews with teachers conducted by Sukmayadi et al. (2011) concluded that either much teachers' knowledge of CAR was theoretical or their understanding was incorrect; both of which were caused by the lack of effective PD programmes. Pati (2014) highlighted the fact that, in comparison, there was a higher number of teachers lacked the necessary qualifications and training in conducting CAR than those who did not. Regrettably, there were many who had teaching certificates obtained in just three years after earning their junior high school diplomas, hence the unfamiliarity of CAR and the lacking of CAR prerequisite skills (*Ibid.*). This is indirectly in line with my study (Abdusyakur & Poortman, 2019) that showed teachers in Indonesia lacked knowledge and skills in using data (which is the main tool in conducting CAR) to their teaching instructions and practice and lacked training in helping them overcome the problems. In addition, Hajar et al. (2020) in their study suggested that reflective practice was not easily implemented in a rural and disadvantaged area in Indonesia, which was the site for their project. In their findings and discussion, it was clear that teachers at the beginning of the study not only lacked the concept of critical reflection, but were also unable to improve their reflective abilities over the course of the project (*Ibid.)*. According to them, this reality is "somewhat ironic, given the various claims made over the last 50 years or so about the liberatory and empowering possibilities for practitioners who engage in action research" (p.455). It could be argued that this shift was made more difficult by the official status of CAR as a requirement for teacher certification within a system that requires passive compliance to regulatory practices. The whole process of CAR becomes problematic, difficult, and even impossible to implement when it is situated as a technology of control (*Ibid.*).

3. **Lack of motivation** – Another issue is low teacher motivation to participate in PD. Rahman (2016) in his study revealed that teachers only participated in PD programmes when rewards are offered or asked to attend by the heads of schools instead of their own will. Widodo & Riandi (2013) add that the top-down PD programmes by the government which cover expenditures, allowances, and accommodations of the participants may have eliminated teachers' intrinsic motives. Some teachers might assume that there was lack of urgency to apply the knowledge obtained from the programme. They might find it unnecessary to apply the knowledge since they were confident with the way they taught. Yet, other teachers intending to implement the knowledge from the programme in their practice sometimes found it difficult because of time constraints, overloaded duties, and lack of teaching materials (Rochsantingsih, 2005).

4. **Lack of the opportunity to practice CAR -** The third issue is limited PD opportunities, especially for teachers in rural areas of Indonesia (Zein, 2016; Luschei & Zubaidah, 2012; Supriatna, 2011). It is known that Indonesia is an archipelagic country with more than 17,000 islands (Tikson, 2008), having Java Island of western Indonesia to be the most populated (World Bank, 2020; Firman, 2017) with 58% Indonesian population (World Population Review, 2014) and where the capital city is. According to Hajar (2017), approximately 30% of financial distribution is allocated in western Indonesia, whereas 70% of impoverished areas are located in eastern Indonesia. This geographic disparity affected a great gap in both social and economic aspects. For example, educational facilities in Jakarta are as up-to-date as those in other developing countries, while the standard of education in other areas are as low as underdeveloped countries (*Ibid.*). Kurniawati (2013) also found the inequality between Java and other islands that despite the inequalities among the provinces, the government's focus was stil merely on urban populations.

Issues in the PD programme implementation

The Indonesian government has introduced many policies for education quality improvements. However, PD programmes had not been effective in upgrading teacher quality and learning outcomes have continued to lag, especially in rural and remote areas (World Bank, 2020; Jalal et al., 2009) contended that . Below is the list of the arising issues:

1. The first issue is that many programme providers exclude the role of teachers in designing and preparing the PD activities (Supriatna, 2011). Consequently, teachers' actual needs are not addressed in the programmes. Rahman (2016) and Widodo et al. (2006) found that most predetermined subjects in PD programmes are set by the government.

2. The second issue is related to the selection of PD participants. A study by Widodo et al. (2006) found that many PD programmes were attended by the same teachers. Although they attended these PD programmes, it did not significantly change their teaching practice. In this regard, teachers who lived in the city tended to have better connection with the local agency education, taught at well-established and/or prestigious schools, and had more opportunities to participate in government-initiated PDs than those in rural areas.

3. The next issue concerns the lack of monitoring of the implementation of the knowledge from the PD programme (Supriadi, 2003). The follow-up to the programme, whether it was carried out in the classroom or not, relied on the teachers' perceptions of its relevance or importance. For instance, although teachers had the opportunity to take part in PLPG, particularly those who had followed a certification programme with this scheme, the government had yet provided a system of PD, following their participation in PLPG, to maintain and reinvigorate their knowledge and skills (Supriatna, 2011).

Based on the discussion above, it seems that teachers in Indonesia still encounter challenges in following PD programmes. It can be said that PD programmes in Indonesia are still close to

the traditional concept, because the implementation of a successful PD programme depends on school facilities and resources. Problems from PD programmes and PD activities without the specific need for teaching and learning are likely to arise. The level of teacher participation and motivation to share the experience tends to be interrupted by communication. Meanwhile, many regions face geographical problems to take part in the programmes. In addition, the PD programmes adapt a top-down approach where they are usually planned and designed by the government or programme providers. These challenges are evident in the context of this study.

For the time being, while implementing this policy, Indonesia is in the trials of implementing new effective models and strategies for autonomy in education within its context under the policy of "Merdeka Belajar" (freedom to learn) where teachers have the autonomy to design their own curriculum. This new policy supports if not strengthens the previous policy about CAR. The aim of exploring the impact of a PD programme in this study is to illustrate its characteristics and the strategies to implement it. Whether this model is applicable, it needs further scrutiny relating to the context and culture in Indonesia.

Summary

Although CAR is now seen as a potentially important tool for teaching practice improvements, it is no surprise that PD programmes about CAR have become a major issue in Indonesia over the past decade. Despite the problems reported above, suggestions have been made that CAR has to be continuously introduced and implemented in schools as a PD in Indonesia (Thamrin, 2018). Lim et al. (2009) recommend that programme providers evaluate the effectiveness of their programmes to ascertain the quality and success. Several studies have mapped the possible effects of PD (*e.g.* Van Veen et al., 2012; Desimone, 2009), evaluation models of PD have been developed (*e.g.* Muijs & Lindsay, 2008; Guskey, 2000), research on these topics is fragmented and an integrated view on PD evaluation about CAR is still missing. The practice of CAR is still relatively new in Indonesia and there are only f`ew studies published in the literature that show how it can be used in PD. More research is encouraged to help implement and improve teachers' learning opportunities for the maximum benefit of teachers, specifically PD programmes about CAR in Indonesian context (Thamrin, 2018). Several studies suggest a construction of a more comprehensive framework to produce data-based decisions about the PD programme evaluation (King, 2014; Desimone, 2009; Borko, 2004; Guskey, 2000). An elaborate study of PD programme about CAR is required to understand the existing perspectives and outline methods for its improvements, developing an extended framework for evaluation that can be utilised for further practice and study. Accordingly, this research was produced to identify such issues which was actually set in my home country Indonesia.

2.4 EVALUATING THE IMPACT OF PD PROGRAMMES

There is a substantial extent of literature on what defines effective Professional Development (PD). The impact of PD on all areas of student learning and development has been the latest focus on effective PD (Walsh, 2014). Lydon & King (2009) highlight the problems of relating PD outcomes with an impact on student learning. Keay & Lloyd (2011) have constructed a

model to facilitate teachers in being responsible towards their learning and concentrating their students' needs at the beginning of the process. This approach results in positive effect that the identification of the impact on student learning supports the evaluation of the impact of professional learning at the start of the development process. Unfortunately, it depends on the school culture that encourages collaborative PD. The demonstration of value for money and effective use of time are valid PD processes as is testing the impact of PD on student learning, but the focus is often on the impact of PD programmes rather than the professional learning that teachers have engaged in. It is important to know what is being measured and useful to identify the evaluation purpose and process using multiple models. The problem is that this is a highly sophisticated model of evaluating teacher learning that is not currently utilised by most PD programme providers. Assessing the impact of a PD programme is a major challenge that many education systems are trying to address. It is often instinctive and unplanned (Opfer & Pedder, 2011) and only considers teachers immediate feelings (O'Sullivan, 2011). It uses questionnaires or a summary of activities undertaken during the programme without giving any importance to the effectiveness of neither the activities nor teachers' gain in knowledge and/or changes in practice (Muijs & Lindsay, 2008).

Research shows that evaluating the impact of a PD programme needs to adopt a systematic approach (Muijs & Lindsay 2008) and focus on teachers' learning, engagement with the programme, and changes in practice (Opfer & Pedder, 2011; Wayne et al., 2008; Kervin, 2007). Moreover, Guskey (2014) views PD as a systematic approach of change at all levels of educational practice ranging from teacher beliefs and attitudes to classroom practice. This view is discussed in this literature review as an impact of PD programme on teachers to develop at these levels, such as teachers' knowledge, skills, attitudes and classroom practice. However, in Ofsted report (2006), evaluation was identified as the weakest link in England's PD chain, which according to Earley & Porritt (2010) was caused by the lack of proficiency in and presence of effective evaluation tools. They suggested that planning for evaluation method with respect to expected outcomes prior to the start of the programme was vital. In my study, a planned approach is adopted towards developing a conceptual framework for the evaluation of the impact of a professional development programme about CAR in Indonesia. The following section discusses evaluation models before explaining my conceptual framework.

2.4.1 PD programme evaluation models

In this section, literature available on PD programme evaluation models is assessed to synthesise a new conceptual framework for this study. The study of King (2014) which evaluated models of Kirkpatrick (1959), Guskey (2002), and Bubb & Earley (2010) is used as a starting point in this evaluation.

Kirkpatrick (1959) first conducted a study on impact evaluation in the field of business. In 2002, Thomas Guskey developed Kirkpatrick's model to be used in an educational context. Bubb & Earley (2010) further developed Guskey's model to offer a more extensive model consisting of twelve levels of impact. Below is a comparison of the models of Guskey (2002) and Bubb & Earley (2010).

Table 2. Comparison of evaluation models

Guskey (2002)	Bubb & Earley (2010)
	1. Baseline picture
	2. Goal
	3. Plan
1. Participant reactions	4. The experience
2. Participant learning	5. Learning
3. Organisational support and change	6. Organisational support
4. Participants' use of new knowledge and Skills	7. Into practice
5. Student learning outcomes	8. Student learning outcomes
	9. Other adults in school
	10. Other students in school
	11. Adults in other school
	12. Students in other school

Beside Guskey's five levels, Bubb & Earley (2010) placed additional stages before and after PD activities to provide the planning and expected outcomes. The first three levels constitute the planning, which Guskey himself also suggested in 2002 that the reversal of the five levels could be beneficial in planning a programme to facilitate the outcomes as expected. The last four levels constitute broader outcomes, taken not only from the students whose teachers follow a programme, but also from the other teachers and students.

Both Guskey (2002) and Bubb & Earley (2010) claim that the stages in their evaluation models are sequential in nature and interrelated with the results of one stage leading to the development of the subsequent stage. Hence, the success of a stage was critical for the success of the subsequent stage. Conversely, Coldwell & Simkins (2011) dispute the notion that the stages are successive in nature and outline a more nuanced model that takes into account the complex nature of all variables that influence teacher engagement with a programme, teacher learning, teacher change, and student outcomes. King (2014) in her study also recognises that the challenge in developing an evaluation model stems from the difficulty in outlining the causal relationship between a programme and its outcomes due to the external influencing factors.

My study developed an extensive evaluation model by covering not only the impact levels but also their influencing variables affecting the outcomes. Theories from Desimone (2009) and Coldwell & Simkins (2011) are used to draw a connection between Bubb & Earley's (2010) and Guskey's (2002) models to develop a conceptual framework deemed suitable for this study.

Desimone (2009) established a basic model (Figure 2) representing an operational theory of how a PD programme influenced and had an impact on teacher and student outcomes.

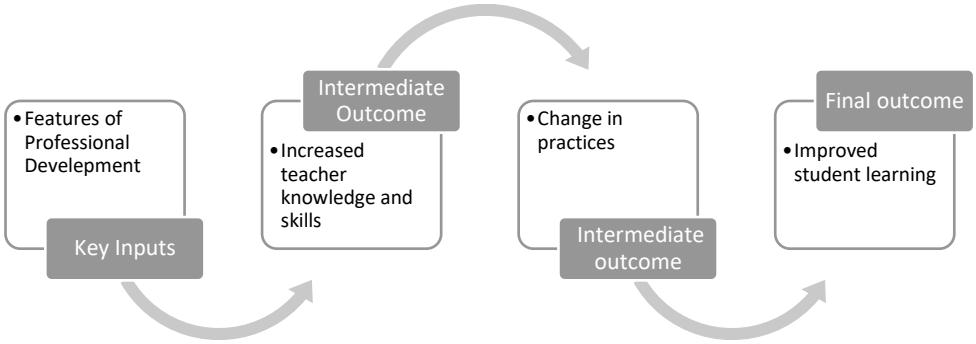


Figure 2. Basic evaluation model (Desimone, 2009 p.185)

There is also a similar model established by Coldwell & Simkins (2011) (Figure 3) that represents causative relationships of a programme with various kinds of potential outcomes as a comparison.

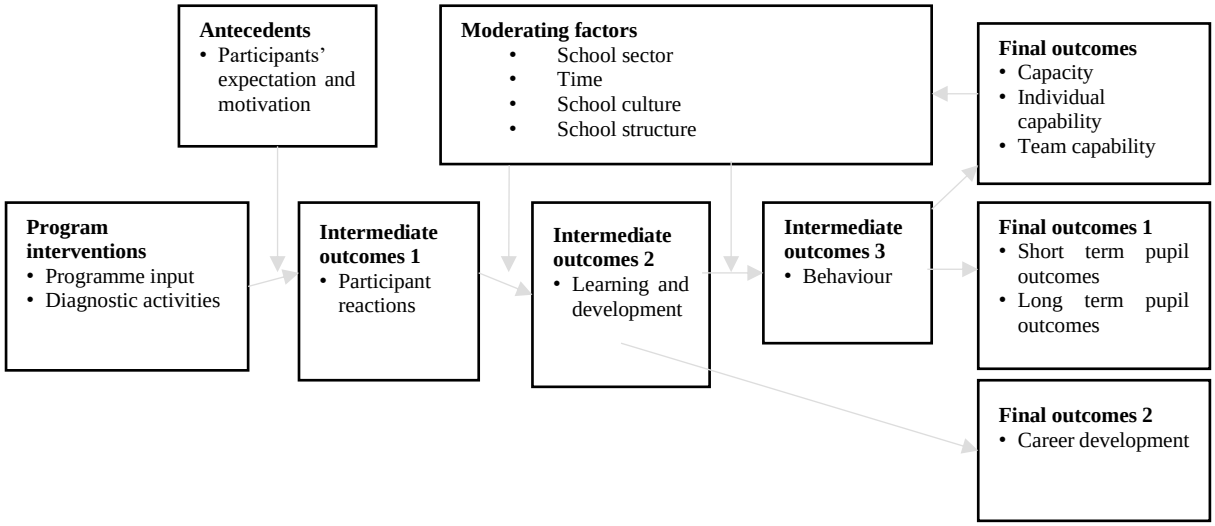


Figure 3. Evaluation model (Coldwell & Simkins, 2011 p.148)

Desimone's (2009) and Coldwell & Simkins' (2011) models reflect the process of evaluating the impact of a PD programme as follows:

- **Key inputs** – First, teachers experience the PD programme (Desimone, 2009). This level represents the features or activities of a programme as the inputs or the interventions (Coldwell & Simkins, 2011). This matches Guskey's (2002) Level 1 and Bubb & Earley's (2010) Level 4.
- **Intermediate outcomes** – This level is considered as the pre-conditions that enable the attainment of the final outcomes (Coldwell & Simkins, 2011). It identifies the increase in teachers' knowledge and skills and the changed attitudes, which represent Guskey's (2002) Level 2 and Bubb & Earley's (2010) Level 5. It is followed by the use of their new knowledge, skills, and attitudes to improve the practice (Desimone, 2009), which matches Guskey's (2002) Level 4 and Bubb & Earley's (2010) Level 7.

- **Final outcomes** – The last process is the final outcomes measured in terms of the expected outcomes of the programme, primarily the impact on teachers and students (Coldwell & Simkins, 2011). This level identifies teachers' improved learning, career development, and practice in school (Desimone, 2009). This matches Guskey's (2002) Level 5 and Bubb & Earley's (2010) Level 8.
- **Influencing factors -** These factors are the variables in the internal environment of teachers (teacher motivation) influencing the reason they undertake programmes and the impact of this on the outcomes (Coldwell & Simkins, 2011). It also takes into account the external environment of teachers (school and wider environment) that regulate how interventions are implemented and explain why similar intervention activities have diverse outcomes across different individuals and schools. Coldwell & Simkins (2011) categorised these factors as school sector, participant role/school structure, participant continuity, programme-based support, wider in-school support, time, and school culture. These factors match Guskey's (2002) Level 3 and Bubb & Earley's (2010) Level 6 which outline the need for organisational support identifying how schools act as a promoting/hindering factor in the implementation of a PD programme.

While the models above link student learning with a PD activity as the final outcomes in evaluating its impact, it is also important to recognise the complexity of teachers' learning and change in practice. This may in turn help in supporting teacher engagement with PD and subsequent implementation of these learnings to attain student outcomes (Wayne et al., 2008), as there is no automatic link between teacher PD and student learning outcomes (Cumming, 2002). Conclusively, my study focuses on evaluating the impact of a PD programme on teachers, particularly teacher perceptions of a PD programme about CAR and how it impacts on their learning and practice.

The framework for my study sought to build on previous work and develop it. This led to the development of a new model representing an operational theory of how a PD programme has impact on teachers. Figure 4 below shows four levels of impact as a provisional framework relevant to this study. The levels are: teacher experience as the key input, teacher learning as the intermediate outcome, teaching practice improvements as the final outcome, and organisational support as the moderating factor. Each level was developed with relevant theories related to the CAR implementation.

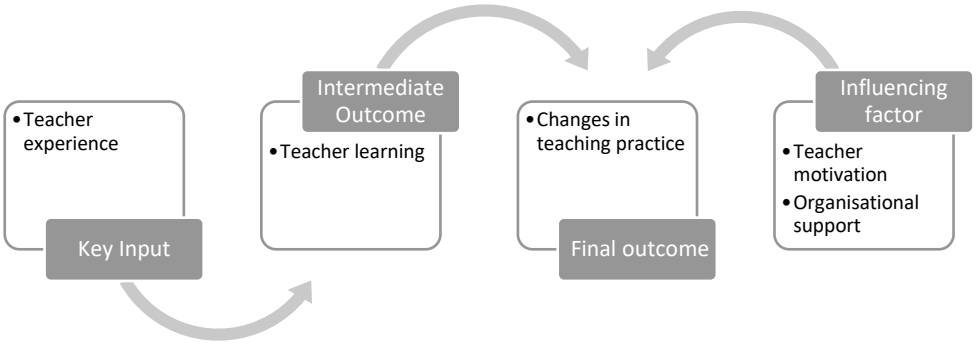


Figure 4. Proposed model for my study

2.4.2 Teacher experience

The first part of the conceptual framework is teacher experience. This is Guskey's (2002) Level 1 which concerns participant initial experience. Bubb & Earley (2010) also have a similar level in their evaluation model, namely The Experience. Teacher initial satisfaction with the experience can be addressed with various structural aspects such as time management, useful materials and suitable environment. Currently, this is the most common and easily collectable form of evaluative evidence. This covers whether the participants enjoyed the event and thought it was useful, well-presented and well-organised, and whether it addressed their needs. This approach can be used to help answer three main types of questions: content questions (*e.g.* were the problems addressed relevant, was the material useful?), process questions (*e.g.* was the programme well-prepared, was the time well-spent?) and context questions (*e.g.* was the room the right size or temperature?) (Guskey, 2000). However, in many ways it is also the least informative that it tends to be impressionistic and highly subjective. Even though they address possible pre-requisites that can facilitate a PD programme leading to change, they do not measure this (Muijs & Lindsay, 2006). Fortunately, a growing body of empirical research suggests that a core set of features is common to effective PD. These core features that lead to teacher learning provide a starting point for assessing PD programmes, and they lead to a core conceptual framework for judging whether PD is doing what we want it to do (Desimone, 2009). Such an approach, of course, requires a consensus on the core features of effective PD.

There is an abundance of information on what makes professional development effective. Effective PD is anything that engages teachers in learning activities that are supportive, job-embedded, instructionally-focused, collaborative, and ongoing, making teachers more likely to consider PD relevant and authentic and improve their teaching practice (Hunzicker, 2011).

A list of characteristics of effective PD was also provided by Borko et al. (2010) after reviewing six different reports in the literature. In terms of content, first, they argued that the content of PD had to be situated in practice, addressed practice-related problems, and focused on student learning. Regarding the process and structure of PD, they analysed that PD needed to adopt modelling instructional strategies because "when teacher educators model instructional strategies, PD participants have the opportunity to experience these strategies as learners, and then reflect on their learning" (*ibid*., p.550). They also suggested that beside teachers need to be active learners and maintain ongoing and sustainable cycles of learning, PD activities are encouraged to be held in a school setting integrated with the school improvement and provide opportunities for teachers to participate actively and collaboratively in professional learning communities (such as peer observation, mentoring, team teaching, or collaborative inquiry). Similarly, Lim et al. (2009, p.7) suggested that PD programme providers needed to be collaborative, job-embedded, site-based, and need-based.

In reviews of research on PD, there seems to be a consensus on what constitutes core features about at least some of the characteristics of PD that are critical to increasing teachers' knowledge and skills and improving their practice, and which hold promise for increasing

student achievement (see Borko et al., 2010; Penuel et al., 2007; Johnson et al., 2007; Borko, 2004). As Desimone (2009) summarised, the six core features of an effective PD programmes used for this study are: (a) content focus, (b) active learning, (c) coherence, (d) sustained duration, and (e) collective participation.

1. **Content focus:** Content focus is a feature that appears in many reviews (Borko et al., 2010; Desimone, 2009). Successful results of PD are found when development efforts are made together with teachers instead of being designed as doing things to teachers (e.g. Clarke & Hollingsworth, 2002; Nilsson, 2014). A focus on classroom practice is important for a programme to be effective, more specifically, on teaching and learning of subject matter that is the pedagogical content knowledge and student learning processes about specific subject matter (Darling-Hammond et al., 2017). Unlike the generic programme held externally from teachers' school or district contexts, it is situated in teachers' classrooms with their students giving teachers the opportunity, *e.g.* to test out the new curriculum or study their student learning in the content area (Cordingley et al., 2015). According to Timperley (2008), it also helped teachers in addressing the diverse needs of students as well as teachers in differing settings. Teacher professional learning that is context specific, job embedded, and content based is particularly important for addressing the diverse needs of students (and thus teachers) in differing settings. PD is also deemed more effective when it has training in subject knowledge (Cordingley et al., 2015; Dunst et al., 2015; Desimone, 2009), in contrast with PD offering training in general pedagogical techniques. However, it is commonly debatable that the two PDs are reciprocally complementary with each other and PD is therefore most effective when both trainings on subject knowledge and general pedagogical techniques are delivered together (Sims & Fletcher-Wood, 2021).

2. **Active learning:** A PD programme needs to encourage active learning, by means addressing *how* teachers learn, as well as *what* teachers learn. They need to have the opportunities to get involved, *e.g.* making their own application, analysing student results, observing and receiving feedbacks rather than passively sitting through the programme (Desimone, 2011). Accordingly, engaging in meaningful activities and understanding its implications help teachers to make a significant improvement for their own practice (Timperley, 2008). The opportunity for teachers to engage in the same learning activities they are designing for their students is often utilised as a form of active learning. "Active learning" suggests moving away from traditional learning models that are generic and lecture-based towards models that engage teachers directly in the practice they are learning and, preferably, are connected to teachers' classrooms and students. Active learning, in sharp contrast to sit-and-listen lectures, engages teachers using authentic artefacts, interactive activities, and other strategies to provide deeply embedded, highly contextualised professional learning. Active learning is also an "umbrella" element that often incorporates the elements of collaboration, coaching, feedback, and reflection and the use of models and modelling (Darling-Hammond et al., 2017).

3. **Coherence:** What teachers learn in a PD programme need to be coherent with their goals, belief, knowledge and skills (Desimone, 2011; Guskey, 2003). The consistency of school, its district, and state reforms and policies with what is taught in a programme is another

important aspect of coherence (Penuel et al., 2007). According to Timperley (2008), coherence helps not only to promote teachers' learning and improvements in practice and improve the sustainability of the effects of the programme, but also to prevent the programme from being perceived as an isolated endeavour. One way to assess whether a PD activity is part of a coherent programme of teacher learning is to ask whether the activity builds on earlier activities and is followed up with later, more advanced work. It is claimed that it facilitates teachers to implement their learning in real classroom situations. This approach is in contrary with lectures in which teachers gain new information passively but do not practice it (Sims & Fletcher-Wood, 2021). PD is also claimed to be more effective when teachers address and involve in it (Cordingley et al., 2015).

4. **Collaborative participation:** This feature can be accomplished through participation of teachers from the same school, grade, or department in a PD programme together to build an interactive learning community. According to Darling-Hammond et al. (2017), collaboration may extend a host of configurations, meaning from one-to-one or small group collaboration to schoolwide collaboration to collaboration with other teachers beyond the school. By working collaboratively, teachers are likely to build communities that positively change the culture and instructions of their entire grade level and/or school as well as adapt new learning into existing practice (Timperley, 2008). Darling-Hammond et al. (2017) reveal a finding that from collaborative biweekly workshops in which teachers as participants jointly reviewed upcoming lessons, discussed science concepts with peers, engaged in reflections on their students' learning, and participated as learners in inquiry-based science activities they would be implementing for their students, students of these participating teachers demonstrated significantly higher science and reading achievements than students who were engaged in business-as-usual instruction (Darling-Hammond et al., 2017). The requirement for collaboration is determined as the need to work with multiple peers or a "community of practice". It provides teachers the chance to question each other and correct misunderstandings. The transfer of information directly from a course leader to an individual participant is often in opposite with being particularly ineffective (Sims & Fletcher-Wood, 2021).

5. **Sustained duration:** An effective PD programme includes more encounters spread over time (*e.g.* one day or one semester), the number of hours spent in the programme and provide teachers with sufficient time to learn, practice, implement, and reflect upon new learning that promotes changes in their practice (Darling-Hammond et al., 2017; Desimone, 2011). However, research has not indicated an exact "tipping point" for duration since the optimum duration depends on the goals of the programme and the type of activities, while too many hours of a programme can be ineffective (Telese, 2008). A minimum number of hours of programme were suggested for changes in teacher behaviour to happen, ranging from 14 (Yoon et al., 2007), via 20 (Desimone, 2009), to 80 (Supovitz & Turner, 2000). After all, what these studies presented is that a significant amount of time (both span of time and actual hours) is important to create an effective programme. Long-term interventions combined with enduring follow-up support (*i.e.* follow-up interventions, permanent support of group collaboration and ongoing facilitation of teacher learning) appear to be more effective than one-shot, short-term

interventions (Desimone, 2009; Yoon et al., 2007). Some of the reviews develop this point further by claiming that PD needs to be organised in a cycle or rhythm in which the content is revisited or iteratively developed. The justification for this is usually that it takes time for teachers to assimilate new knowledge. By contrast, single, one-day sessions are often cited as being particularly ineffective (Sims & Fletcher-Wood, 2021).

Despite many researchers relying on the above-mentioned features, some argue that they may be unreliable predictors to the success of a PD programme. Kennedy (2016) in her study shows that content focus, collaborative participation, and PLCs using video-based lesson analysis have little to negative impact on student learning and sustained duration is less effective when combined with prescriptive messages on teachers. In addition, Sims & Fletcher-Wood (2021) conclude that the underpinning research does not support the consensus as it employes inappropriate inclusion criteria and a flawed inference method. For example, time management shows no relationship with the impact on student attainment (Basma & Savage, 2017; Kraft et al., 2018).

In addition to the above-mentioned core features of what constitutes an effective PD, I allow two more characteristics of effective PD programme in regard with my study cases which present the role of expert that needs to be discussed in this chapter, *i.e.* the quality of trainers and mentoring session. A brief explanation is presented below.

1. Quality of trainers as a characteristic of effective PD programme

In this context, 'trainer' can be regarded as a 'lecturer' or 'facilitator' who helps teachers develop new knowledge and skills (Borko, 2004), which makes the quality of trainers holds a crucial part in an effective PD programme (Merchie et al., 2018; Beijaard et al., 2015; Choi & Morrison, 2014; Cheng & So, 2012; Walker et al., 2012; Borko, 2004). It is one of the things that keeps teachers interested and engaged with a PD programme and makes them encouraged in applying what they have learnt from the programme into their daily teaching practice. A study of Dunst & Raab (2010) showed the effectiveness of a PD programme teachers followed and assessed its usefulness and effectiveness in catalysing classroom practice change after teachers followed in PD sessions. They concentrated on three main types of PD: one-day (sometimes two- or three-day) workshops, conference presentations, and in-service training that involved a week-long training and on-site training within their classrooms. Findings in the study showed that lectures, short workshops, and conferences were the most commonly attended PD programmes, and first-hand practice and feedback from mentors or coaches deemed to be impactful in affecting changes in the classroom context. Accordingly, they concluded that based on their findings, the workshops and lectures were the least effective, and week-long or on-site training programme had the most impact on teachers' teaching practice. In addition, findings in a case study conducted by Beijaard et al. (2015) showed that a trainer's feedback was crucial in encouraging primary school teachers' self-regulation. They suggested that trainers could provide feedbacks matched with each individual teacher's need and address their concerns, practice and learning characteristics. Other researchers also highlighted the necessary of having specific, constructive (one-to-one) feedback provided by the trainer (Choi & Morrison, 2014; Cheng & So, 2012).

2. Mentoring session as a characteristic of effective PD programme

Mentoring session involves one-to-one relationship that aims to assist teachers with new strategies and techniques that may help teacher and student performance (Kraft & Blazar, 2018). It is an individualised approach to giving support for specific classroom practice (Finn et al., 2019), which is time intensive, context-specific sustained work conducted between a mentor and mentee in which observations are conducted and feedback was given on teaching practice (Kraft & Blazar, 2018). According to Rhodes & Beneicke (2002), the term of 'mentoring' has a merely slight difference with 'coaching': mentoring involves an element of 'counseling and professional friendship' and coaching is more skill-based, which Clutterbuck (1991) concludes that mentoring often implies a relationship where one partner is novice and the other more experienced. The relationship of mentoring is more likely to be hierarchical and also be collegiate, like peer coaching (Kennedy, 2005). Besides, the quality of interpersonal relationships is also crucial. Rhodes & Beneicke (2002) support this notion that for a successful mentoring, participants need to have well-developed interpersonal communication skills. A study conducted by Aguilar (2013) found that "schools with coaching programs saw significant improvement in measures of teacher practices and student outcomes compared to schools without coaching programs" (p.10). Knight (2009) similarly analyses that when teachers engage in supportive personalised learning such as mentoring, "more than 90% of them embrace and implement programmes that improve students' experiences in the classroom" (p.4).

2.4.3 Teacher learning

The second part of the conceptual framework focuses on teacher learning. Teacher learning is intermediate outcomes of a PD programme, whereas teachers' knowledge and skills, attitudes and beliefs, or both, may be improved by following a PD programme (Desimone, 2009). Guskey's (2002) Level 2 (Participants' Learning) ascertains whether the intended knowledge and skills were realised by teachers as the participants. Bubb & Earley (2010) also have a similar level (Level 5 - The Learning) in their evaluation model, focusing on the same issues with the significant added dimension of a focus on 'attitudes' – acquired or enhanced.

There are two types of learning or outcomes that may result from a PD programme: cognitive and affective (Muijs & Lindsay, 2006). They distinguish knowledge and skills as cognitive outcomes and motivation and attitude as affective outcomes. Such outcomes acquired and modified by following a programme may result different knowledge and skills, depending on the particular subject of the programme and the way the programme is delivered (Muijs & Lindsay, 2006). Desimone (2009) categorises the quality of teachers into skills, knowledge, and attitudes, which represents Guskey's (2000) categories of learning goals: psychomotor, cognitive, and affective. Skills relate to what participants demonstrate with their learning of the PD programme (Guskey, 2000). Cognitive is defined as teachers' pedagogical and subject content knowledge. First, pedagogical content knowledge refers to a teacher's understanding of learning difficulties, strategies, and insights in specific subject matter (Van Driel & Berry, 2012). Second, subject matter content knowledge is the knowledge that teachers have in specific subject matter. Studies showed positive impacts of a PD programme on teachers'

subject content knowledge, for instance, in mathematics (*e.g.* Garet et al., 2001), science (*e.g.* Buczynski & Hansen, 2010), social (Willemse et al., 2015) or language (*e.g.* Goldschmidt & Phelps, 2010). Second, as to the affective factor, study about PD programme outcome on teachers' belief about learning and in themselves can also be detected. Choi & Morrison (2014) in their study showed an improvement in primary school teachers' beliefs in themselves to practice science inquiry in their classroom. In this respect, Levensen & Gal (2013) emphasise that classroom practice changes may not occur without teachers believing in themselves in making a change.

In order to explore the expected outcomes of teacher learning of a PD programme about CAR on teachers, the conceptual framework divides the impact on teacher learning into two kinds of outcome: learning new knowledge and skills in conducting CAR and changing teachers' attitudes towards CAR. Each is discussed below.

1. Knowledge and skills in conducting CAR

To develop an evaluation model for teachers' expected knowledge and skills in conducting CAR, it is important to explore the process of conducting CAR itself. Lambirth & Cabral (2017) address a lack of a set of skills needed to get involved in systematic and rigorous research is one of the aspects that may prevent teachers from engaging in sustained and reliable CAR.

Researchers define stages of a process for conducting action research over the years. Stringer (2007) describes CAR as a "simple, yet powerful framework" consisting of a "look, think, and act" routine. During each stage, participants observe, reflect, and then take some sort of action. This action leads them into the next stage. Lewin (1945) who is credited with coining the term "action research" also depicts CAR, which includes fact-finding, planning, taking action, evaluating, and amending the plan, before moving to the next action step. Bachman's (2001) concept of CAR encourages that teachers collect data, make an action plan, act on the plan, evaluate and reflect the action(s), and plan for a new cycle based on the observation result. Riel's (2019) progressive problem-solving through CAR model invites teachers to the cycle's four steps: planning, taking action, collecting evidence, and reflecting. Piggot-Irvine's (2006) CAR model shows similar steps which are planning, acting, and reflecting, through three subsequent CAR cycles. Mills' (2011) CAR concept begins with a central problem or topic which involves some observation or monitoring of the current practice, follows with a synthesis of information and data, and does an action which then such action serves as the basis for the next stage of CAR.

Although each of the above CAR models uses different words, in essence they possess some common elements: a sense of purpose based on a problem (problem formulation), observation or monitoring (data collection), synthesis of information gathered (analysis and interpretation of data), development of an action plan (action), and evaluating the action (reflection). These shared elements were explored in identifying the expected knowledge and skills in conducting CAR.

Formulating problem: The first knowledge and skill is knowing how to make a clear purpose (Lai & Schildkamp, 2013). A clear purpose constitutes what problem is being addressed and which data are required. According to Fraenkel & Wallen (2003), addressing and narrowing a problem require teachers to remember that the goal is to make things better, improve some specific practice, or correct something that is not working as well as it needs to be. In the formulation, it is also necessary to keep it manageable by determining things like time requirements (or restrictions), data collection and analysis skill levels of the individual(s) conducting the research, and any budgetary limitations. However, this general idea of teachers expecting data may help answer the problems causes many schools to collect a lot of data without effectively using it for problem-solving that further leads to information overload and a waste of time. Conclusively in the formulation, it is better to know which data is required to efficiently facilitate the collection of data so that teachers can properly use them with a clear purpose (Lai & Schildkamp, 2013).

Collecting data: The next knowledge and skill are knowing how to find relevant data and use it effectively (Protheroe, 2001). Sagor (1992) believes that data collection is the heart of CAR process that allows researchers to look for trends. It enables teachers to look at the issue through different lenses. According to Lai & Schildkamp (2013), once a clear purpose is found in the problem formulation stage, it is easier to know how data needs to be collected from possible data sources. Fraenkel & Wallen (2003) determine three data collection techniques. First, teachers can observe participants (*e.g.* students, other teachers, parents, and administrators) involved in the educational process. Whenever observations are made, it is advised to record what is observed as much as possible. Field notes or journals are commonly used to describe what is seen and heard in detail. Second, interviews may also be used to collect data from students or other individuals. Interviews can be done both by an oral question-and-answer exchange between two or more individuals and a written form through the use of a pencil-and-paper medium also known as a questionnaire or survey. The third data collection technique involves the examination and analysis of existing documents or records. Examples of such documents or records are attendance records, minutes of faculty meetings, school newspapers, lesson plans, policy manuals, seating charts, and student portfolios. This examination and analysis are usually the least time-consuming since the data have already been collected; it is the job of teachers to make some sense of what is already there. From the three techniques, Fraenkel & Wallen (2003) suggest that it is better to use multiple techniques in collecting data. This allows teachers to relate or integrate two or more sources of data to develop their accuracy and quality.

Analysing and interpreting data: This is the stage of the analysis process when teachers begin to make connections between the data acquired and the problem addressed. Analysing data constitutes contextualising, categorising, calculating, connecting, and/or summarising data in a way that meets the purpose in answering the problem. Johnson (2008) argues that when collecting data, analyse them by looking for themes, categories, or patterns that emerge. This analysis may influence further data collection (and analysis) by helping teachers to know what to look for. At this point, teachers need to ask themselves the following question: "how does the information help me understand and answer my problem?". In addition, Schwalbach (2003) argues that it is also important to look for contradicting or conflicting information in the data with the patterns or trends that have emerged. The information may make the interpretations

more inconvenient, but including them in the process makes the findings more accurate and meaningful to the future teaching. At last, teachers need to remember to reduce the volume of information collected without minimising, distorting, oversimplifying, or misinterpreting the data, which can be done by identifying and organising the data into important patterns and themes to construct some sort of framework for presenting the key findings of CAR (Johnson, 2008; Schwalbach, 2003).

Interpreting data means understanding the meaning of data and its implication (Lai & Schildkamp, 2013). In this step, teachers examine behaviours, events, or others' observations for relationships, contradictions, similarities, and so on (Parsons & Brown, 2002). The key is to search data aspects that answer the question, offer challenges to current or future practice, or lead to future practice. Descriptions need to join the interpretations provided as teachers' background, experiences, and expertise may affect the ways in which the data are interpreted (Parsons & Brown, 2002).

Taking action and reflection: The next knowledge and skill needed is taking action. Once the interpretation result is clear, teachers can take proper action to overcome the initial problem they have (Lai & Schildkamp, 2013). According to Johnson (2008), teachers need to make an action plan consisting of simple descriptions or brief statements about the exercise of a new educational practice, a plan to reflect on alternative approaches to analyse the problem, a plan to distribute teachers' learning to other teachers interested in the topic (*e.g.* other teachers, administrators, boards of education, or other schools or districts), or any other "next steps" teachers may perform. Fraenkel & Wallen (2003) argue that the key aspect of developing an action plan is having a strategy for testing, carrying out, or otherwise putting into practice the changes from the CAR engagement. The action plan is fundamentally a proposed strategy for practicing the results of CAR. It may be made for an individual teacher or classroom, collaboratively among a group of teachers, or on a schoolwide or even a district-wide basis. It may be important to make a formal document describing the action plan in certain conditions; often, clearly describing guidelines for exercising feasible and adequate solutions. Sufficient documented information is required relating to the implementation plan, as teachers do not need to depend on their collective memories for future implementation of solutions. Fraenkel & Wallen (2003) add that the effectiveness of the action needs to continuously be monitored, evaluated, and updated, thus keeping the cyclical nature of CAR.

The last knowledge and skill needed is reflecting on the action(s) taken. Because of the fact that CAR is largely about introspectively examining teachers' own practice (McMillan, 2012), reflection can be done by critically exploring the action taken from the previous step, the reason behind such action is taken, and its effects. Besides, reflection is also about critically re-examining exactly who is involved in the process, what helps teachers consider this aspect of their teaching practice, why they choose to do what they do, where the suitable place is (*e.g.* time, sequence, location) to exercise future changes, and how this affects their practice. Taking the time to carefully answer these questions yields in a more meaningful examination of practice and improve the level of efficacy (McMillan, 2012). Parsons & Brown (2002) add the importance of teachers to be active participants as well as active observers in their classrooms by identifying and interpreting classroom data collected in a systematic manner and using that

information as a basis for future planning and decision-making. According to Mertler (2016), although reflection is commonly done at the end of a given cycle, it is important for teachers to reflect on and critically examine their practice continuously during the process of teaching or throughout the entire CAR so that the progress is continuously monitored. By doing this, teachers are not confined to decisions made at the outset of a project; they can adapt their procedures if the situation warrants.

2. Attitudes towards CAR

This section explores teachers' attitudes required in conducting CAR. Teachers' attitudes are strong predictors of implementation and ultimate success of a PD experience (Lumpe & Chambers, 2001). Understanding the importance of teachers' attitudes may strengthen teacher PD (Desimone, 2009). According to Lumpe and Chambers (2001), "teachers enter PD programmes with certain attitudes and behaviors that will affect [the programmes] implementation" (p.93). The purpose of their study was to "develop an instrument designed to assess teachers' beliefs about using technology in the classroom" (p.93). Attitudes required in conducting CAR consist of teachers' belief in CAR as a way to help their teaching improvement and in themselves (efficacy). Explanations of each were presented below.

Teacher belief: PD activities are frequently designed to initiate change in teacher attitudes, belief, and perceptions. Programme providers, for example, often attempt to change teacher belief about certain aspects of teaching or the desirability of a particular curriculum or instructional innovation. They presume that such changes in teacher attitudes and belief may lead to specific changes in their classroom. PD programmes based on the assumption that change in attitudes and belief comes first are typically designed to gain acceptance, commitment, and enthusiasm from teachers and school administrators before the implementation of new practice or strategies (Guskey, 2002). Teacher belief needs to be seriously dealt with and taken into consideration to make improvements in teaching practice (Hart, 2002), as Pedersen & Liu saying (2003), "the study of educational beliefs of teachers has been strongly advocated for the simple but powerful reason that teachers' beliefs guide the decisions they make and the action they take in the classroom, which in turn has an impact on students" (p.60). A common way of looking at impact is that teacher learning, attitudes or belief change first, which is then followed by changes in teaching practice, resulting in an improvement in student learning or wellbeing. However, Guskey (2002) considers that this change rarely happens in reality because teachers change when they see that the new skill they try out make a difference to students. In this view, beliefs are reflected in one's practice. For example, if a teacher strongly believes in the usefulness of rewards, they will most probably use rewards in his or her classroom (Girardet, 2018). In such cases, changes in belief occur after teachers experience alternative practice. It is evident that teachers do not necessarily enact what they believe in, and that they do not necessarily believe in the usefulness of their practice (Buehl & Beck, 2015; Lee, 2009). This suggests that the relationship between beliefs and practice is complex. Change in one area of influence may not lead to change in another: teachers may change their beliefs but not their practice or change their practice but not their beliefs, and ultimately may not improve student learning (Bubb, 2012). The position taken in this review is to consider the relationship between beliefs and practice as interactive and

mutually dependent (Buehl & Beck, 2015). Practice and reflection on practice are likely to result in changes in belief, and, reciprocally, beliefs seemingly drive actions (Guskey, 2002).

Teacher belief generally covers believing in CAR as a way to help improve teaching practice and specifically covers belief in data (buy-in belief) as a major part of CAR itself. Data plays an important part in CAR to the extent of teachers accepting and believing in the use of data (Kerr et al., 2006). When teachers believe that data is important to drive practice (Wohlstetter et al., 2008; Schildkamp, 2007), data usage may be promoted. In contrast, when they do not believe in data and think that "experience is enough" (Ingram et al., 2004) then the use of data in schools may be greatly hampered. This is in line with Girardet's (2018) study that concludes when prior beliefs are deeply rooted, they are difficult to change. They act as strong filters impeding the impact of training. Inversely, Girardet (2018) also argues that when beliefs are vague and not well thought out, they build further and are reconstructed through teacher education which helps the construction of adaptive beliefs.

Teacher confidence: Teacher confidence talks about teacher efficacy in having the capacity to make changes (Bandura, 1977). Dellinger et al. (2008) define teacher efficacy as individual beliefs about their own abilities to successfully perform specific teaching and learning related tasks within the context of their own classrooms. Knoblauch & Hoy (2008) similarly define teacher efficacy as teachers' judgment of their capability to bring about desired outcomes of student engagement and learning, even among those students who may be difficult or unmotivated. Two case studies illustrate teachers' will to change. Joan, the only teacher participating in a study by Arora et al. (2000) had a strong will to engage with innovative practice aimed at managing her students' motivation and engagement, which was one of her main internal factors for evolution. Another example, in the study of two English teachers in Japan, Mori et al. (2011) found that teachers were not only concerned with improving their students' linguistic ability, but also with values such as confidence, independence, and reasonable ability to communicate and this might influence the way they change their practice. On the other hand, in a study by Turner et al. (2011), one teacher, Helen, had more challenges than the others in implementing innovative practice to encourage her students' motivation and engagement and in maintaining relationships with and among her students. An analysis of her script revealed that she had stopped changing the way things were in her classroom. This sense of disbelief that her teaching would not influence her students led her to feeling no purpose in changing, and accordingly causing reluctance to engage in the programme. This showed that teacher efficacy heavily influences teachers' willingness to change, namely a teacher's 'judgement of his or her capabilities to bring about desired outcomes of student engagement and learning' (Tschannen-Moran & Hoy, 2001, p.783). Aelterman et al. (2016) show that teachers' intentions to exercise proposed classroom strategies are relevant to a change in teacher efficacy. Gregoire (2003) argues that teachers with low efficacy tend to to see change as threatening, which may lead them to adhere only minimal processing of the obtained information, to refuse the proposed strategies, and to hinder changing. Thus, efficacy is seemingly one moderator of teachers' eagerness to change. Teacher education and PD programmes provide new changes to teachers, that targeting ways to enhance teacher efficacy may improve teachers' willingness to change and facilitate the processing of obtained information and adaptive classroom management change (Girardet, 2018). Moreover, teacher efficacy may be cultivated through the use of CAR (Henson, 2001). In a study of teacher

change through CAR, Bleicher (2014) found that teachers involved in CAR reported an increase in their belief regarding student abilities and an increase in expectations; and they were empowered through knowledge and able regain their enthusiasm for teaching and a high sense of efficacy.

Maintaining efficacy in teachers' respective selves may result in an increased sense of autonomy (perceived ownership) of their own data (Kerr et al., 2006). This refers to teachers as an individual believing that they have more control over their behavior and are able to control events that affect them. Increased autonomy can be experienced by teachers analysing data to identify what is or is not working and formulate new plans of action. When teachers have autonomy, they attribute success or failure of their research primarily to themselves, rather than externalising to somebody else (Bandura, 1977). In fact, this may motivate themselves to examine their weaknesses and strengths, and develop solutions for future actions and, therefore, make them have a better chance to improve their practice (Kerr et al., 2006). In the last three decades, research anchored in self-determination theory (Deci & Ryan, 2009; 2000) highlights the importance of autonomous motivation for teacher learning and development. When autonomously motivated, teachers view themselves as the "origin" of their own behaviour, whereas in controlled motivation, they view themselves imposed by others. Roth et al. (2007) found that autonomously-motivated teachers experienced less exhaustion because they viewed their engagement in teaching as interesting and significant. This enables teachers to withstand periodic disturbances and obstacles, and may prevent deleterious experiences leading to low vitality and exhaustion. On the other hand, teachers lacking autonomy when their students fail tend to find external factors to blame, such as difficult tests, rather than themselves. These teachers are less likely to improve their practice (Kerr et al., 2006) and hence more difficult to conduct research. From a study conducted by Atay (2008), autonomy seemed to have effects on teachers' perspectives towards CAR: "After having done research myself, I think what I can claim about my classroom or my students is much more reliable because I have my own data which I collected with a questionnaire and classroom observations" (p.10). Similarly, Aelterman et al. (2016) showed quantitatively that teacher belief change was linked with their intentions to implement the proposed autonomy-supportive strategies.

2.4.4 Changes in teaching practice

Teaching practice changes constitute the final impact in evaluating a PD programme about CAR. When a PD programme is directly intended to change teaching practice, it is essential to evaluate whether teachers are actually using the new knowledge, skills and attitudes acquired (Guskey, 2002). Guskey's Level 4, however, was further developed by Bubb & Earley into Level 7 (Into Practice – Degree and Quality of Change). The level (Bubb & Earley, 2010) divides teaching practice improvements into three categories: new process, new product, and teaching outcomes. The study framework takes into account these three categories.

CAR usage

Improvements of teaching practice in terms of CAR as a new process concentrate on the usage of CAR itself. As many researchers have studied, there are a number of CAR usages to improve

teaching practice. For example, Kochendorfer (1997) claims that CAR helps teachers in seeking a quantifiable answer, changing teaching practice, restructuring teaching curriculum, understanding of students, understanding of self as teacher, building new professional relationships with colleagues and students, and teaching a new process to the students. Meanwhile from another researcher's perspective, Mertler & Charles (2011) have provided five usages of CAR in their study. The first is that CAR helps deal with teachers' own problems, not someone else's. Second, CAR is very timely; it can start now—or whenever teachers are ready—and provides immediate results. Third, CAR provides teachers with opportunities to better understand, and therefore, improve their teaching practice. Fourth, as a process, CAR also promotes the building of stronger relationships among colleagues with whom teachers work. Finally, and possibly most importantly, CAR provides teachers with alternative ways of viewing and approaching educational questions and problems and new ways of examining teachers' own practice. (Mertler & Charles, 2011). In order to develop a model for the new process in teaching practice improvements, a distinction of impact levels on teachers is made by Frost & Durrant (2003) to help categorise usage of CAR *i.e.* classroom practice, personal level, and interpersonal level. Explanations of each category are delivered below.

1. **Classroom practice:** In this regard, CAR offers a process by which the current practice can be changed towards a better practice (McMillan, 2013). CAR in its systematic nature lets teachers to be more flexible in their thinking, more accepting to new ideas, and more organised in their effort to problem-solving that enables teachers to solve problems better (Johnson, 2008). If the goal of CAR is to improve teaching practice and change, then the specific target of that improvement or change has to be addressed first (Johnson, 2008). The problem identification basic process happens when a situation is monitored and a recognition that something within that situation could probably be done better occurs (Johnson, 2008). Analysing, defining, and limiting the question include its specification, actively reaching further comprehension of the situation and then uncovering its possible causal factors. For example, a teacher conducting CAR found that as she analysed data, she made many instructional decisions. She stated that: "Studying specific domains of student performance and her own instructional practice has become a way of life" (Calhoun, 2009, p.101). Mitchell et al. (2009) argue that the power of CAR as a PD tool lies in teachers' working context where they deal with their classroom problem.

   Usages of CAR on classroom practice concern with the adoption of teachers' new practice or improvements. Garet and colleagues (Garet et al., 2008) showed a positive impact of their PD on the utilisation of data-based instructional method by teachers. Bakkenes et al. (2010) conclude six stages of change in practice, that is, considering one's own practice, experimenting, avoiding old ways, experiencing challenges, getting inspirations from other teachers. Mertler & Charles (2011) described them by providing several categories of CAR usage in classroom practice. Such categories are: creating instructional materials, managing classroom management, creating instructional methods, grading and evaluation, and conferencing. Beside the extensive kinds of usage in classroom practice from Metler & Charles, there are also other usages unmentioned. The other usages are the following: reinforcing teachers' intuition to make a change in their instructional practice (Cohen & Byrnes, 2007), helping teachers measure improvements in student learning by using data to determine the effects of their CAR plan (Mills, 2007), and enhancing the effectiveness

of teaching and helping teachers become empowered (Johnson, 2008; Parsons & Brown, 2002).

2. **Personal level**: Personal level concerns with CAR usage to increase knowledge and personal development of teacher. CAR usage for personal development is that CAR as a systematic reflection is likely to make teachers become more reflective to their teaching practice (McMillan, 2012) and more aware of the importance of student involvement in the classroom (Trent, 2003) that it provides teachers with the stimulus for changing and improving practice in order to make it appropriate for students and people whom teachers work with (Parsons & Brown, 2002).

   Another usage of CAR for teachers' personal development is that improving efficacy in themselves that they feel more confident as teaching practitioners; this confidence is manifested in various ways (Knight et al., 2009). Edwards (2009) found in her study that several teachers she interviewed mentioned feelings of 'reassurance' and 'satisfaction' that they were teaching in ways that suited students' needs and goals. There is a quote from a teacher: "In terms of personal teaching, I think it gave us the satisfaction that we were on the right level and taking the students on the right path [… it was], I guess being reassured was the most important thing, it was really good to see that we were on the right track" (Edwards, 2009 p.8).

   At last, the usage of CAR is for teachers' own professional growth. It affirms the professionalism of teaching by giving teachers the control in their own PD (Johnson, 2008) instead of having someone else controls what specific goal or topic needed by a teacher (Schmuck, 1997). Such control further improves teachers' own professional judgment and gives insights into better, more effective means of achieving desirable educational outcomes (McMillan, 2012). Consequently, it allows them for a much more meaningful approach to PD. This approach lets teachers to investigate their own practice and to discover what may and may not work in their classrooms (Metler, 2016).

3. **Interpersonal level**: At last, interpersonal level concerns with the usage of CAR for teachers to engage with each other in collaborative endeavour. CAR is collaborative (Metler, 2016). CAR enables teachers to collaborate with parties both inside and outside the school (Burns, 2009; Johnson, 2009). Burns et al. (2022) note that CAR is a powerful tool for improving and transforming practice at the local level and reducing teachers' isolation at work. It is composed of teachers working together in empowering relationships to bring together different perspectives, ideas, experiences, and resources in improving their own practice (Atay, 2008). Some teachers discussed how collaboration with colleagues made them reflect on their own practice:

   > "Putting theory into practice was great. It was nice to dwell on each other's lessons objectively and to try to find solutions to the problems together. I find it difficult to reflect on my own work when I'm alone, but when a colleague tells me about my weaknesses and encourages me to talk about myself, I find a solution easily." (Atay, 2008 p.10)

Beside improvement in the relationship with colleagues, CAR is a powerful tool that can transform teachers' relationships with their students. It allows teachers to gain more insights into their students' needs and perspectives (Edwards, 2009). For example, Butler et al. (2004) showed the positive effects of PD on teachers' skill in tailoring their teaching instruction to their students' needs. Kiemer et al. (2015) in their study showed positive influences of PD programme emphasising on giving constructive feedback on the interaction between teachers and students. The usage of CAR on classroom level is further highlighted in a study conducted by Rogers et al. (2007). It is a transformational process, as the relationship between teacher and students increases. By putting students in the center of teachers' pedagogical decisions, they establish a more personal relationship with their students, develop a better understanding of who their students are as learners, and give students a voice in the classroom (Rogers et al., 2007).

Levels of use

The outcomes from teachers conducting CAR are commonly viewed in two ways: whether they use the teaching practice changes or not (Muijs & Lindsay, 2008). Muijs & Lindsay (2008) consider that such degree and quality are measured in terms of the number of teachers going through different phases of implementation of their learning, and, thus, such phases are important to be taken into account. A few researchers support the idea of using such degree and quality as a measure of the sustainability of practice (King, 2014; Bolam et al., 2005; Baker et al., 2004).

Similar with King's study (2014), this study uses Hall & Hord's (2011) framework outlining eight Levels of Use (LoU) of implementation to evaluate this teaching outcomes and measure its degree and quality. Guskey (2000) provides an extensive explanation of the LoU implementation. LoU presents behavioural profiles of eight different approaches to using an innovation by putting teachers' developments into categories in acquiring and using the improvement into their teaching practice. Because it is behavioural, accordingly, it does not deal with attitudes, emotions, feelings, or the quality of the innovation. The focus is on what an individual or group is doing or not doing. Hall & Hord (2011) provide a framework which outlines eight Levels of Use (LoU) of implementation to evaluate teaching outcomes and measure its degree and quality. LoU presents behavioural profiles by putting teachers' developments into categories in acquiring and using the improvements into their teaching practice. A successful determination of LoU is based entirely on the specification of clear behavioural indicators. This study examines behavioural indicators of LoU of CAR implementation presented in Table 3 below.

Table 3. Levels of Use (Hall & Hord, 2011, p.7)

Level of Use	Behavioural indicators
Non-use	Absence of CAR implementation or involvement
Orientation	Actions taken to learn more detailed information about CAR
Preparation	Decision and preparation made for first use of CAR

Mechanical use	Teacher primarily clings to the user guide from the programme to use CAR
Routine	Established use of CAR Little thought about improving CAR use without making any changes to it
Refinement	Changes made to the use of CAR to increase the impact on teaching practice
Integration	Commitment to use the innovation with other teachers to provide a collective change
Renewal	New developments are made in conducting CAR to improve the impact on students

As seen from the table above, LoU consists of three levels of non-use (Non-use, Orientation, and Preparation) and five levels of use (Mechanical use, Routine, Refinement, Integration, and Renewal). The lowest level of non-use describes individuals who are taking no action whatsoever with respect to the new knowledge or skills. Those at the Orientation level are just beginning to seek information, whereas those at the Preparation level have acquired the new knowledge and skills and are getting ready for use. Teachers who have just completed a professional development programme and are preparing to put into practice what they have learnt are considered at the Preparation level. The first level of use is the mechanical level. Individuals at this level are implementing the new ideas, but they are doing so in very mechanistic, uncoordinated, and superficial ways that there is a tendency of inaccuracies or misinterpretations that would be unlikely in the knowledge of a person at the refinement level. Routine users, on the other hand, have established a regular pattern of use but are making few, if any, changes, whereas refined users are assessing impact and making changes to improve effectiveness. Refinement explains individuals make changes to the use as a way of making improvements. Integration describes individuals who are making deliberate efforts to coordinate with others who are also engaged in use. Those at the renewal level, on the other hand, are actively seeking more effective alternatives to established patterns of use (Hall & Hord, 2011). According to Guskey (2000), the best PD programmes include an explicit examination of behavioural indicators of LoU as part of the learning experience, which might help teachers document not only frequency of use, but also, in many instances, the appropriateness of use within specific contexts. A successful determination of LoU is based entirely on the specification of clear behavioural indicators.

2.4.5 Influencing factors

The last part of the evaluation model focuses on influencing factors, *i.e.* teacher motivation and organisational support. Below is the explanation.

Teacher motivation

One of the most important aspects for teachers participating in a PD or classroom research engagement is teacher motivation (Yuan et al., 2016). The literature on PD recognises that intrinsic and extrinsic factors are the driving motives for teachers to participate in PD programme. The first reason is associated with internal motives. Intrinsic motivation is linked with teachers' willingness to engage in a PD activity for their own sake (Schunk et al., 2012).

The motivating factors may be associated with teachers' personal interest in PD programmes about CAR, the need to improve practice (McMillan et al., 2016), their orientations or dispositions, and the notion of self-efficacy as well as with their perceptions about student achievement and experience with improve practices (Bleicher, 2014). The second reason is associated with external motives, namely extrinsic motivation. Scribner (1999) found that teachers engaging in PD were motivated by remuneration and licensure requirements, such as for career development, prestige, and income. Engaging PD about CAR can be considered as external motivation if it is used as a tool merely for teacher promotion.

Organisational support

In regard of organisational support, it identifies of how the school promotes or hinders teachers using their new learning into their practice after following a programme. A professional PD is unlikely to have long-term effect in the absence of organisational support (Muijs & Lindsay, 2008), as it impacts on teachers' motivation and the sustainability of change (Guskey, 2000). According to Cordingley et al. (2015), the degree of support differs but is present in some form in most programmes associated with teachers' making significant changes to their practice. It ranged from understanding the precise nature of expected changes to practice and creating organisational conditions for these to occur. It is an important part of an evaluation since it may have an impact upon motivation on the one hand and sustainability of change on the other (Guskey, 2000). It matches with Guskey's (2002) Level 3 and Bubb & Earley's (2010) Level 6. A supportive school ethos and an expectation that all teachers engage in CAR have been found to be crucial factors in securing change as a result of a programme (Sagor, 2000). Researchers have identified organisational factors that promote/hinder teachers in using the new initiative, which I have concluded as follows.

1. **School leadership**: School leadership is a factor to promote a new initiative as it involves decision-making authority in the school programme (Wohlstetter et al., 2008). Initiative of development does not just happen. It has to be managed and led, done so effectively ensuring it has a positive impact and represents good value for money (Bubb & Earley, 2009). The PD literature often makes a distinction between the 'workshop' and the 'workplace' stating that the latter is more powerful than the former in terms of people's professional learning and practice (Bubb & Earley, 2007). Heads of schools play an essential role in the initiative. They need to encourage, motivate, and facilitate teachers (Datnow et al., 2012; Coburn & Turner, 2011; Wohlstetter et al., 2008; Young, 2006), be enthusiastic about the initiative and convey this enthusiasm to staff (Sutherland, 2004). Leaders with a clear strategy developed simple procedures to help ensure that staff development worked (Bubb & Earley, 2009). According to Young (2006), leaders need to model research engagement and plan and scaffold teachers' learning about the initiative. Those able to effectively engage data for inquiry and decision-making are knowledgeable about and committed to research-engaged and build a strong vision for research-engaged in their schools (Mieles & Foley, 2005; Choppin, 2002; Feldman & Tung, 2001). Even so, vesting all leadership for engaging research in one person may be problematic. Several studies have found that the most successful heads of schools were able to initially lead teachers towards research but then worked to create more distributed

leadership around it (Wayman & Stringfield, 2006; Copland, 2003). Fullan (2002) showed the importance of strong leadership in any organisational initiative, and implementation of a successful research initiative requires the same.

It is important for educational leaders to encourage and facilitate professional learning and development in their schools (Leithwood et al., 2020; Day et al., 2020; Evans, 2014). Pont (2020) concludes an eclectic set of research that covers school leadership from different perspectives. Each tackles the question of school leadership reform from different angles. Leithwood & Seashore-Louis (2011) argue that the practices of distributed and instructional leadership, along with teachers' confidence in heads of schools, are associated with improvements in school outcomes. Branch et al. (2012) determine that an effective head of school may increase student results by two to seven months within a school. Robinson et al. (2009) conducted a meta-analysis of studies that measured the influence of different types of leadership practices on school improvement. They identified a set of roles that contributed the most to improving the results of a school, such as: work in the planning, coordination and evaluation of teachers and the curriculum; set objectives and expectations; manage strategic resources, and ensure an orderly environment conducive to learning. A study by Leithwood et al. (2020) identify seven strong claims about school leadership practices that have a positive effect on school outcomes. The practices that make a difference are categorised as follows: setting goals or objectives, managing the education programme and human resource development, and redesigning the organisation. Taken together, these studies demonstrate a number of important points: (1) school leadership has a statistically measurable impact on education outcomes; (2) the influence of heads of schools is indirect that it establishes the conditions for learning; and (3) there are specific leadership practices that actually contribute to improvement (Pont, 2020).

There are three characteristics of effective school leadership (Bass & Riggio, 2006). The first one is transformational leadership which focuses on winning teachers' 'hearts and minds' and encouraging teacher and school improvement. Transformational leaders motivate others to do more, set more challenging expectations, and usually yield better performances and cultural change (Bass & Riggio, 2010). Organisational capacity can be actualised by heads of schools, which involves providing PD and on-going support for teachers and schools as learning organisations, both of which enhance the change process (Muliati et al., 2022; Fullan, 2002). What is notable about heads of schools making organisational capacity aimed for change is that they planned well and did not micromanage this initiative in which they had invested a lot in terms of time, timetabling and resources (King, 2011). Another characteristic identified is coaching leadership where heads of schools listen to their teachers' problems in conducting CAR and encourage them. It concerns building leadership capacity in individuals through improving professional relationships (Robertson, 2016). It is in line with what Priestley et al. (2013) described at secondary level as 'facilitative leadership (trust, democratic structures, autonomy, innovation, risk taking)' which contributed to teachers' engagement with change. The last characteristic is a progressive leadership. A progressive head of school encourages teachers to learn and try new ways of CAR and also provides effective school structure and policy to improve CAR implementation. Accordingly, the most successful heads of

schools are those able to initially lead teachers towards a new initiative and create more distributed leadership around it (Wayman & Stringfield, 2006; Copland, 2003). These findings were confirmed by previous studies which suggested the significance of effective leadership in schools, hence the good heads of schools might enhance the practice in schools (Wohlstetter et al., 2008; Kerr et al., 2006). Leadership also plays a fundamental role in catalysing collaboration among teachers based on trust and respect (Bottery, 2006; Leonard & Leonard, 2003; Lugg & Boyd, 1993), where all teachers are equally ranked and input is highly respected (King, 2011). Collaborative practice commonly starts with 'exchange and coordination' and move along a continuum to 'more complex professional collaboration' based on sharing feedback on practice and improvements (Conway et al., 2011; Gilleece et al., 2009).

2. **Teacher collaboration**: The way teachers collaborate affects CAR activities in schools. Studies have suggested the virtues of collaboration by teachers, when engaging in their CAR projects. Atay (2006) found that the teachers appreciated the collaboration aspect of CAR as it helped them to identify issues in teaching, to gain new knowledge and skills, and to complete their projects successfully. In this case, through collegial sharing in CAR, Pine et al. (2009) maintained that teachers were able to improve their classroom practice through collegial sharing in CAR. Bubb & Earley (2009) conclude that staff development which involves discussing, coaching, mentoring, observing and training others is said to be highly effective. Schmoker (2003) explains that research activities need to be teamwork. Lessons, strategies and other results targeted to improve teaching practice and student learning need to be shared and refined between teachers. This collaborative approach enhances connection among teachers (Spillane, 2006) which promotes more participation and sharing of result at school level. Thus, schools whose teachers work together may promote the research activities because they can share the collection, analyses, interpretation, and use of result (Wohlstetter et al., 2008; Young, 2006; Wayman, 2005). Although much collaboration happens as a result of a research initiative, it is important to build structures for collaboration and to preserve these data tools as main ingredients of collaboration (Wayman, 2005). Examples of these include a form of distributed leadership, schoolwide data workgroups, and data committees that support individual data exploration (Copland, 2003). However, although widely advocated, collaboration can be hard to exercise. Case studies showed the relationship between research and collaboration is a reciprocal one: research initiatives are more likely to be successful if teachers are allowed to learn and work collaboratively, and the use of data helps foster constructive collaboration (Symonds, 2003; Feldman & Tung, 2001).

   It is crucial for teachers receiving support in building collaborative practice (O'Sullivan, 2011). Findings from Bolam et al. (2005) case studies in the UK showed that teachers needed to willingly trust others, and this trust would extend as collaborative practice developed. Gunn & King (2003) pointed out that inattention to school cultural issues, like implicit power relationships, could quickly affect collaborative work. They also argued that many pitfalls could be avoided by having substantive discussions of teaching and learning, developing a collective understanding of goals, and engaging in professional staff inquiry (*Ibid.*). Collaborative cultures give a system for dissemination of findings by giving teachers space to encourage others try the practice (Goos et al., 2007).

Unfortunately, collaborative cultures alone do not result change without focusing on knowledge of curriculum, assessment and student learning (Sparks, 2003). It may consolidate collaborative practice at first and develop into collaborative practice in the future. In this way, collaboration may be an effect of PD and come under the heading of impact of PD (King, 2011). Furthermore, findings from Cordingley et al. (2005) of collaborative PD from across the world showed the importance to provide non-contact time to encourage collaborative planning for PD. The commitment to research has been associated to schools whose time is used with clear objectives to discuss the result of research (Wohlstetter et al., 2008). In addition, allowing some time to reflect and consolidate learning is also important for teachers (King, 2011; Stevenson, 2008; Neil & Morgan, 2003).

3. **School culture**: In this study, a critical condition for teacher PD is a supportive school culture. Postholm (2012) highlights that teacher PD may be influenced by a positive school culture with a good atmosphere. School culture constitutes a set of core beliefs and assumptions, attitudes or the way things are done in a school (Evans, 2008). It decides how schools operate (Evans, 2008). It is commonly determined by the actions or words of heads of schools and also by teachers that it is likely to impact change as the teachers change (Webb, 2007). In the study of investigating the features of effective PD in schools, Simon et al. (2011) argue that PD is effective where schools have an open and sharing culture and supportive systems. Huffman & Kalnin (2003) consider that changing school culture is a complex process, as it requires various stakeholders to reach a collective vision, and responsibility for the benefit of students. Simon et al. (2011) identify the characteristics of a supportive school system and structure, including high quality school in-service programmes, a timetabled staff development plan, and high expectations of staff to coach and mentor pre-service teachers or less experienced teachers. They also point out that peer observation, shared practice and a shared vision are more likely to be emphasised in an open school culture.

As a conclusion, teacher motivation and organisational support *i.e.* school leadership, collaboration and school culture are all tied together to promote teachers in using CAR to improve their teaching practice and for school development purpose.

2.5 CONCEPTUAL FRAMEWORK FOR MY STUDY

Drawing on the review of the literature, I have developed a provisional framework for my research as shown in Figure 5 below which focused on the relationships among the four levels of impacts. Each level is categorised and systemised with relevant theories related to the PD programme about CAR.

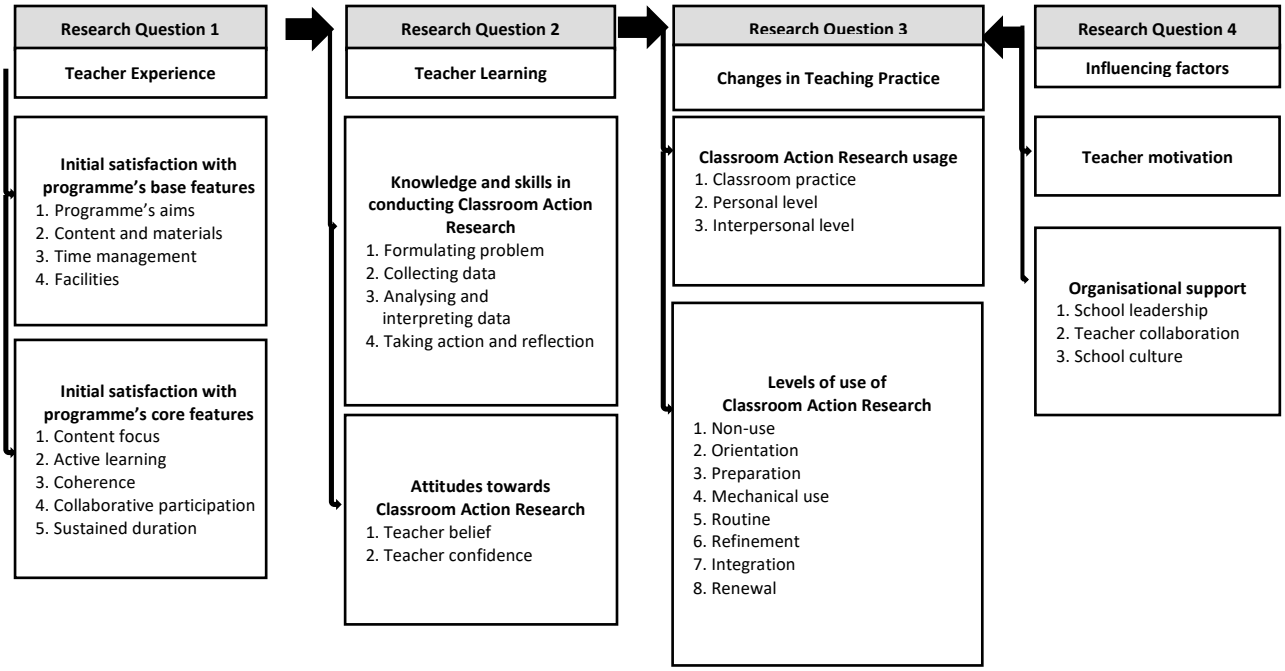


Figure 5. Provisional framework of my study

The framework is operationalised by linking a research question with a particular section of the conceptual framework. Thus, the conceptual framework guides the research concerning where to collect relevant data. To explore the impact of a professional development programme about CAR on teachers, the framework suggests answering four following specific research questions focusing on the relationships among the four levels of impact:

Research Question 1: What are the teacher experiences on the programme?

The question explores the features and activities in a PD programme about CAR that teachers have experienced. Accordingly, the first part of the framework addresses this question. It covers teachers' initial satisfaction with the experience. The satisfaction is around structural activities, such as time management, room organisation and materials. It also covers what features occur in the programmes. The expected features investigated consist of content focus, active learning, coherence, collaborative participation, and sustained duration.

Research Question 2: What do teachers learn from the programme?

The study is expected to identify the impact of a PD programme about CAR on teacher learning. Accordingly, the second part of the framework addresses this question. It covers teacher knowledge and skills in conducting CAR and teacher attitudes towards CAR. The expected knowledge and skills consist of formulating the problem, collecting data, analysing and interpreting data, taking action, and reflecting; meanwhile, the expected attitudes towards CAR investigated are teachers' belief and confidence.

Research Question 3: What changes do teachers think they make to their teaching practice?

The study is expected to identify the impact of a PD programme on changes in teaching practice. Accordingly, the third part of the framework addresses this question. It covers the CAR usages on teachers and levels of use of CAR.

Research Question 4: What are the influencing factors that promote or hinder teachers in using CAR to improve their teaching practice?

The study is expected to look at the specifics on what motivates teachers to participate in a PD programme about CAR and how school organisational factors may promote teachers in using CAR as their new learning into practice. Accordingly, the fourth part of the framework addresses this question. It covers teacher motivation and organisational factors, *i.e*. school leadership, collaboration, and school culture.

3 METHODOLOGY

This chapter aims to consider the methodology that was adopted in this study to find the answers of the research questions and to explain the underlying rationale of the research design and methods. The ontological and epistemological assumptions of the study were discussed in this section along with the research programmes and the selection of the participants. The issue of ethical considerations is presented.

3.1 RESEARCH PARADIGM

Research paradigm sets out the underlying belief system that governs a research study. Ontological and epistemological assumptions are the two key elements that outline the research paradigm of a study (Thomas, 2013). Ontology relates to the assumption of the study regarding the nature of reality, while epistemology details the perceived association between the researcher and the knowledge that is developed through a study (Mingers, 2003). Outlining the philosophical assumptions that support my research influenced how the research was conducted and how the results of the study were evaluated (Cassell & Johnson, 2006).

The ontological perspective adopted in this study is constructivism as my study explored how teachers interacted with and were affected by the Professional Development (PD) programme about Classroom Action Research (CAR). Constructivist perspective points to the existence of individual realities (Thomas, 2013) and makes a case for an interpretative explanation of the reality (Cunliffe, 2011). Cohen et al. (2018) note that social research is considered as a subjective study as it focuses on interpreting the experience of individuals in their social contexts. As teachers' opinions regarding CAR were influenced by their individual perception of the reality, this study required interpretative explanation.

In terms of epistemology, my stance was interpretivist. Interpretivist approach takes the view that individuals and natural objects are different from each other and, hence, requires different approaches to study them (Bryman, 2006). This interpretivist epistemology matches the intentions of my research questions because my research primarily focuses on teachers' interpretations of their experiences of the programme.

Regarding the relevance of conceptual framework, there are two distinctive approaches, which are deductive and inductive approaches. Deductive approach tests the validity of theories, whereas inductive approach assists to the emergence of new theories and generalisations. The combination of both deductive and inductive approach is known as abductive research approach (Saunders et al., 2009). It is usual within research in the interpretive paradigm to apply grounded theory developed by Glaser & Strauss (2017), an inductive process where a new theory can emerge and be resulted from data (Crotty, 1998). However, the study used abductive research approach, as this approach started by investigating or testing an existing theory or the conceptual framework. The research process was contributed to modify the conceptual framework or generate a new theory.

Moreover, to analyse a phenomenon comprehensively, it is necessary to support the inductive method with deductive analyses to enable it to cover a real experience such as the impacts of the programme in this study (Saunders et al., 2009).

3.2 RESEARCH DESIGN

This research was a combination of confirmatory and exploratory study. At first, I tested a framework to find out if the theory is supported by teachers' experiences when following a PD programme, which is a confirmatory study. Next, Adopting the constructivism paradigm in this study helped me to investigate how the teachers perceived and made sense of their experiences of the PD programme (Richards, 2003). It is an exploratory study. In this case, I chose to adopt a case study, which belonged to this paradigm, in exploring a rich description of the teachers' accounts of their involvements in the PD programmes (Merriam, 2009).

Case study is a much preferable strategy for research analysing a contemporary social phenomenon or event and for studies that focus on "how" or "why" aspects of phenomenon (Yin, 2013). The prior statement fits well with my research, that the phenomenon was interpreted and explained through teachers' views using the conceptual framework. A comparative analysis of teachers' perceptions offers a broader understanding and explanation of the research questions. Although Creswell & Clark (2017) point the lack of representativeness in the case strategy as a criticism of this design, it is possible to generate valuable insights from the experiences of individuals using the conceptual framework.

The focus of my case study was investigating an issue related to particular cases within a specific setting or context (Creswell, 2012): three different groups of teachers who participated in three different PD programmes about CAR.

In this study, I adopted a collective or multiple case study (Stake, 2008). This case study is used "when there is even less interest in one particular case, a number of cases may be studied jointly in order to investigate a phenomenon, population, or general condition…it is instrumental study extended to several cases" (Stake, 2008, p. 445-446). In this study, in order to understand the study phenomenon of teacher experiences in participating PD programmes, each case of the programme is studied (Stake, 2008). Thus, the case of this study consisted of three different groups of teachers following three different PD programmes about CAR. These programmes are described in the next section. The rationale for adopting a collective-instrumental case study instead of a single one was apparently to enhance the robustness of the study, as suggested by Merriam (2009) who stated, "the more cases included in a study, and the greater the variation across the cases, the more compelling an interpretation likely to be" (p. 49).

3.3 PROFESSIONAL DEVELOPMENT PROGRAMMES

This section gave a brief introduction about PD programmes about CAR in Indonesia made as the research cases for the study. The study was conducted in Jakarta, Indonesia. The

participating site was chosen as a convenience sampling (Creswell & Clark, 2017) as I have network and was able to access PD programmes within the region willing to help the research. In addition, the relative ease of gaining access to the participants and the site, as I live in the city, confirmed my decision to choose the study site.

There were several PD programmes aimed at promoting CAR held during my data collection visit in Jakarta. With the access that I had, I found the three PD programmes in this research with distinct types and models of PD programmes, different types of providers and different durations. PD Programme Version I was a coaching/mentoring programme which involved active roles of the participants and continuous learning (three-month) and was held by an independent PD programme provider; PD Programme Version II presented passive roles of the participants (traditional) and was a continuous learning (one-week) and was held by the government (Indonesian Ministry of Education and Culture); and PD Programme Version III was a one day training programme which required passive roles of the participants (traditional) and was held by an independent PD programme provider. Table 4 below shows the main characteristics of the programmes.

Table 4. **Classroom action research case programme characteristics**

Characteristic	Programme Version I	Programme Version II	Programme Version III
Type of PD	Formal; continuous; innovative	Formal; one-shot; traditional	Formal; one-shot; traditional
Model of PD	Coaching/mentoring	Standards-based	Training
Provider	University lecturers (six Trainers)	Indonesian Government (two Trainers)	An individual trainer
Number of Participants	80 teachers	80 teachers	20 teachers
Duration	Three months Eight hours on the first day Unscheduled coaching session Eight hours on the last day	Five days Eight hours per day	One day Eight hours
Location	University	Government facility	School
Material	Reasoning CAR Planning CAR Implementing CAR Proposal- and report-making	Reasoning CAR Planning CAR Implementing CAR Proposal-making	Introduction of CAR CAR motivation

Programme Version I

Programme Version I was held by a team of university lecturers in education. It was first initiated by a professor in Education from Universitas Negeri Jakarta (UNJ), who then gathered six lecturers in Education and together designed the programme. The six lecturers later became mentors to the participants. The types of PD held by Programme Version I are formal as it was

organised by an institution, continuous as the duration of the programme was three months, and innovative as teachers as the participants were encouraged to actively involve during the programme. This programme adhered to the coaching/mentoring model of PD, as it provided lecturers to become mentors to the teachers during the three-month period.

The programme was held at the institution's university located in the east part of Jakarta, easily located as it was a famous university, easily accessed due to many public transportations having route in the area, and conducive for learning activities. It was open to teachers paying the participation fee. 87 teachers participated in the programme. The programme was conducted outside of schools during the weekends and distributed into five days over five weeks. It was specifically designed not only so that teachers were able to grasp the idea of CAR, but also to conduct CAR into their teaching practice. It was a three-month programme from August until November 2018, divided into three parts: the training day, the CAR-facilitated implementation period, and the presentation day. The reason the training day was just one day is because the optimisation of the practice of CAR was expected by having mentors facilitating teachers' CAR activities. The programme discussed three main topics: Reasoning and importance of CAR, Conducting CAR, and Making CAR proposal and report. The materials were designed ideally in a flow by giving motivation, explaining the concept, building two-way discussions, and facilitating the implementation of CAR. Additionally, the common misconceptions in conducting CAR were also shared. For example, many teachers thought that CAR was just a one-cycle research or experiment, while in truth, it is a repeated cycle to improve their teaching practice. The materials also contained updates of recent developments of CAR in Indonesia, such as the using of recent journals instead of books as references. The training day lasted from 8 AM to 5 PM, having a break for an hour from 12 PM to 1 PM. Teachers were given a three-part session of seminar from 8 AM to 2 PM and a session of workshop from 2 PM to 5 PM by dividing them into groups of their area of expertise: engineering, literature, science, and social studies, and having a mentor to each group. These mentors were lecturers assigned to a group to help supervise teachers in conducting CAR during the three-month implementation period. Teachers were then asked to conduct their own CAR projects of their preferred topic and methods for data-collecting and data-analysing for three months and make their CAR report, facilitated and supervised by their mentor. After three months, they were all invited by the programme provider to the presentation day where they presented their CAR report in front of the others. At first, this was intended to be held in the last week of November 2018, however, due to facility availability issues, it was moved to the last week of February 2019. Ten weeks after the programme ended, teachers were expected to submit the report to DIKJAR as evidence that they had completed the entire process of conducting CAR projects.

Programme Version II

Programme Version II was a government-funded PD programme held by the Ministry of Education. It was held in a government facility, an old building located in the middle of an industrial area, far from teachers' houses and schools. Since it was in the middle of an industrial area, it was neither easy to locate nor access and there was no public transportation going to/from there. This programme is for teachers in Jakarta region invited to improve their score from Teacher Competency Test (*Ujian Kompetensi Guru*) in CAR-module section as a

standarised platform for teachers' competence as they had not reached the passing grade. Consequently, most of the teachers' motive for following this programme was merely because they were invited by the government and they needed to pass the test. 80 teachers from different schools followed this programme. The types of PD held by Programme Version II are formal as it was organised by the government, continuous as the duration of the programme was one week, and traditional as teachers became passive learners during the programme. This programme adhered to the standards-based model of PD, as it presented lectures to the test so that teachers might be able to pass according to the national standard.

The programme was held for five days on school days, Monday to Friday, having four days of training for material discussions and practice and the last day for the Teacher Competency Test in CAR-module section. There were two reasons why the programme took five consecutive days. The first one is the head of the programme wanted teachers to maintain their focus on the programme and the test. The second one is because of the considerable number of participants, causing the programme to be made into batches where each batch lasts for one week. The programme discussed four main topics: The principle of CAR, Conducting CAR, Reflecting the result of CAR, and Proposal-making. The trainer saw the materials only as a way for teachers to be able to pass the passing grade of Teacher Competency Test. Consequently, he put a lot of CAR theories and concepts and made them into test trials and worksheets. The way the materials were presented to the teachers was not through lecturing, but more question-and-answer discussion. Each session was done in one day from 8 AM to 5 PM, having a break for an hour from 12 PM to 1 PM. By the end of each session, teachers were given homework that they had to submit the next day. On the last day, there was only the test taking two hours from 8 AM to 10 AM.

Programme Version III

Programme Version III was a PD programme held by the head of school for his own teachers to learn about CAR. The programme was a one-day training course held at the school on a Saturday, outside school days. Since it was their own school, they found it convenient as it was located close to their houses, easy to locate and access, and conducive for learning activities. The head of school intended to introduce CAR to his teachers as most of them had not had any understanding, knowledge or training about it. The types of PD held by Programme Version III are formal as it was organised by the school, one-shot as the duration of the programme was only one day, and traditional as teachers became passive learners during the programme. This programme adhered to the training model of PD, as it offered new knowledge to the teachers in the form of a training course.

The head of school hired an expert in CAR to train the teachers during this one-day programme. The programme discussed two main topics: 1) Reasoning and importance of CAR; and 2) Conducting CAR and making the proposal and report. The main purpose of the programme was just introducing CAR and motivating teachers to conduct CAR into their teaching practice. However, the trainer compressed the one-semester material readings due to the time limit. He added because the main purpose was just motivating the teachers without having any concern to make sure that they could conduct CAR, he shared his own experiences to inspire them. He

talked about his achievement in winning CAR project respectively held by the government and private institution, and how that made him into a model teacher and eligible CAR trainer. The programme started from 8 AM to 4 PM, having a break for an hour from 12 PM to 1 PM. The first topic took four hours, while the second took three hours. There was a misunderstanding between the trainer and the head of school. The trainer intended to have two sessions, having each session per day. Meanwhile, the head of school thought that the two sessions would be done in one day only. However, they resolved by having one-day training only, causing the trainer only had brief time to discuss the materials.

3.4 DATA COLLECTION

The study used mixed methods to collect data to gain multiple perspectives, which enabled the study to view the impact of the programme from qualitative and quantitative perspectives and to triangulate findings (Richardson, 2005). Five different data collection methods were used in my research: interviews, surveys, observation, focus group discussion, and document analysis. These research methods helped me in analysing the phenomenon in a holistic manner by collecting in-depth information (Creswell & Clark, 2017). The rationale of mixed methods is also that one method can be used to enhance the results of the other methods. The benefit for the mixed methods is that the surveys were followed up with a number of interviews to provide more in-depth understanding. Quantitative data provided a general understanding of teacher experience and teacher learning, teaching changes, and organisational factors promoting/hindering the new learning. Subsequently, qualitative data filters those statistical results by exploring teachers' perspectives to be more in-depth (Creswell & Clark, 2017). Data collection was implemented in phases as shown in the next section. The four research questions were answered together in two location phases: at the programme and at the school.

3.4.1 Data collection method

I employed interviews, observation, documents, surveys and Forum Group Discussion (FGD) as the tools for my data collection. With regard to the relationship of the conceptual framework to the research design, the conceptual framework informs the development of the instruments for this study. The conceptual framework is then integrated into a discussion and implication sections to make meaningful connections between the data presentation, the findings, and the framework used to address the research question and conclude the purpose of the study (Rocco & Plakhotnik, 2009).

3.4.2 Data collection procedure

To select the study participants, I used convenience sampling for the survey, the Focus Group Discussion (FGD) and the interview by approaching teachers willing to participate at the end of the programme. There were in total 101 teachers participated for the survey out of 125 teachers (success rate 80%), 12 teachers for the FGD and 16 teachers for the interviews. In the following section, I described the study phases (Table 5) including the method used for each phase and how I approached the programme, participants and gained access to their schools.

Table 5. Data collection phases

Location	Phase No.	Method	Objective	Respondent	Number of Programme Participants		
					I	II	III
At the programme	1	Interview	Background information on the programme	Head of the programme/trainer	1	1	1
	2	Observation	Implementation of the programme	The programme	80	25	20
	3	Survey	Baseline information Research Question 1&2	Teachers	61	20	20
	4	Focus Group Discussion	Research Question 1&2	Teachers	4	4	4
At the school	5	Interview	Research Question 1,2,3&4	Teachers	6	4	4
	6	Document analysis	Additional Reference material	Teachers' CAR reports, lesson plan	4	1	1
	7	Interview	Research Question 3&4	Heads of schools	2	2	1

At the programme phases (Phase 1 – 4)

A week prior to the start of all programmes, I interviewed each of the head of programme/trainer. The head of programme granted permission for me to conduct the study in the programme and also briefly informed me about the programme. I identified the goal and the ideal experience and skills expected of teachers before taking part in the programme. The interview provided information used for more clarification about teachers' experiences and learning from the programme. The purpose of this interview is for the sake of triangulating the data from the teachers. The aim of this triangulation was for "cross-checking information and conclusions through the use of multiple procedures or sources" (Johnson & Christensen, 2019, p.276).

I attended all programmes to understand what was being taught and what strategies and methods were being used. This helped in understanding how teachers were responding to the programme and how engaged they were with the programme. I used a semi-structured observation technique. This involved the development of topics I focused on during observation and took notes regarding these topics while observing the programme (Thomas, 2013). This approach is particularly helpful for collecting in-depth and wide-ranging

information about a topic and, hence, helps in collecting detailed information regarding how teachers are responding to the programme.

On the last day of all programmes, I asked teachers to complete a survey to investigate the first and second research question, *i.e.* how teachers experienced the programme and what they learnt from it, administered to all teachers following the programme.

FGD was implemented at the end of the programme as it supports interactive discussion among teachers which in turn might help in collecting detailed and in-depth information regarding teachers' experiences and learning from the programme (Thomas, 2013). FGD was conducted to explore the participants' experience of engaging in a PD programme (workshop, training, and practice). The qualitative data emerging from the focus group discussion were used to complement the quantitative survey data collected from teachers. Open-ended questions were used to initiate the discussion, such as what teachers experience in the programme and what they learn from it. I used follow-up questions where necessary to get further views and deeper explanations.

At the school phases (Phase 5 – 7)

Regarding the interview, I gave the teachers my information documents and the consent form and time period of two months to decide their participation. After they had decided to participate, I received confirmations by text messages and/or calls that sixteen teachers were keen to be involved in the study. I immediately arranged the time with each teacher to conduct the interview. Three months after the respective programme ended, the study was conducted at the teachers' schools to investigate the four research questions, specifically the third and fourth research question that had not been addressed before in the first phase, *i.e.* what the improvements in teaching practice are and what the organisational supports are.

Following the interview with the head of school, I had a meeting with the teacher(s) for an interview. Duration of the interview varied between 45 to 90 minutes. Prior to interviewing the teacher(s), I built a rapport and considered the ethical issues, as suggested by Mann (2016) and Richards (2003).

The interview enabled me to gain insight into the ideas, perceptions and feelings of the interviewees, which in turn helped in getting better insight into the impact of the programmes on teachers (Thomas, 2013). The interview was semi-structured to collect data from teachers and heads of schools. Finally, with their permission, I asked for their CAR reports and ask for any additional documents that might be relevant. The value of document analysis is that the interviewees express their views in these reports in their own words and the researcher has no scope for influencing these views (Silverman, 2000).

3.5 DATA ANALYSIS

Data analysis in this study were conducted in two phases. The first phase is descriptive analysis, aiming to quantify and describe the general overview of the two research questions (what teacher experiences are and what teachers learn from the programme) by analysing the descriptive statistics of survey items. The benefit of using descriptive analysis is that it enables the researcher in deriving meaningful inferences from the survey data in a comparatively easy manner using charts and tables (Merriam, 2009). However, the descriptive analysis also limits the ability of the researcher to draw explanatory inferences from the study (Creswell & Clark, 2017). As this study does not aim to make statistical inferences from survey data but rather identify the perspectives of teachers regarding the programme, descriptive analysis may be apt for the study.

The second phase is qualitative analysis using thematic analysis method. It is "a data reduction and analysis strategy by which qualitative data are segmented, categorized, summarized, and reconstructed in a way that captures the important concepts within the data set" (Ayres, 2008, p.867).

Thematic analysis was implemented with the help of a mixture of the deductive and inductive process, *i.e.* pre-specified themes based on the conceptual framework and themes created iteratively during the coding process.

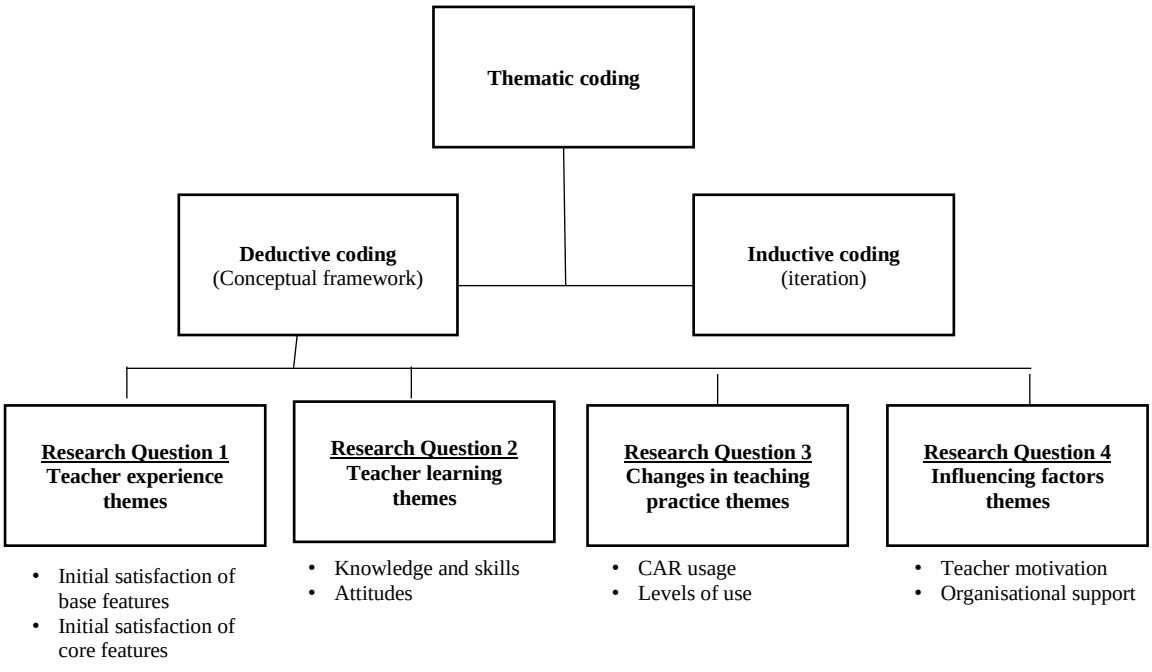


Figure 6. Thematic coding process

In this study, I adopted the steps of data analysis proposed by Merriam (2009), consisting of category construction, sorting categories and data, and naming the categories. Although I

intended to deductively use the conceptual framework in my research as initial themes, additional themes as shown above might emerge from the transcripts inductively.

In inductive coding, Merriam (2009) suggested using open coding and axial coding in this stage, which raw data are initially analysed and categorised. The second phase entails sorting the categories and data In this process, Merriam (2009) asserted that "the categories can be fleshed out and made more robust by searching through the data for more and better units of relevant information" (p.182). Second, she also suggested that "the names of your categories can come from, at least three, sources (or a mix of these sources): … the researcher, the participants or source outside the study such as the literature" (*ibid*., p.184). The iterative process involved going through interview transcripts multiple times and noting down recurring categories. Thus, new categories or subcategories were created along the way. The identified categories were used for developing a matrix that summarises frequency of the response and source (Creswell & Clark, 2017).

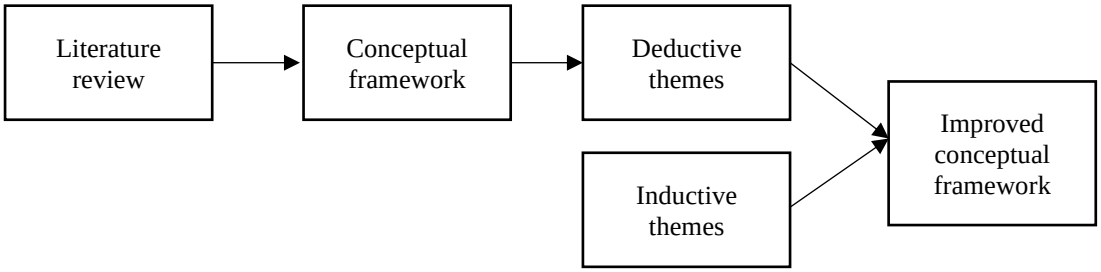


Figure 7. Analysis framework

Finally, the underlying aim of this analysis process is to identify themes regarding the effectiveness of the programme. These iteratively emerging themes were incorporated into the conceptual framework to develop a new evaluation framework regarding the impact of the programme. This means that the deductive themes functioned as the basis for thematic analysis, while the research process contributed to the existing knowledge by developing additional themes inductively (Yin, 2013). Adopting a mix of inductive and deductive approaches enabled me to use the themes emerging from the existing data and develop new inferences through iterative coding of the interview data. However, the findings were not generalisable in a traditional positivist sense of the concept, but in an interpretive sense as the results can be transferred to programme operating in similar circumstances or settings (Evans et al., 2000).

3.6 ETHICAL CONSIDERATIONS

Ethical issues need to be considered in a study regarding "the protection of subject from harm, the right to privacy, the notion of informed consent and the issue of deception" (Merriam, 2009, p.230).

Prior to conducting study, I gained approval to conduct my study from the UCL Research Ethics Committee. Next, one of the main ethical principles in research is ensuring that no harm comes to the participants in a research project, which can be achieved by negotiating access

with participants and promising confidentiality (Hammersley & Trainou, 2012). However, ensuring informed consent in a study in which different stakeholders are involved is an important challenge (Felzmann, 2009). In the Indonesian context, it is very pertinent to meet with the head of any institution to gain permission to conduct research in that setting. My first step was to request an authorisation from District Education Office in Jakarta, an official with a strategic position of supervising schools in Jakarta. I was aware that using this top-down approach to gain access to teachers compromised my relationship with the participants that they might be suspicious or see me as part of the government administration and this might cause them to withhold or provide untruthful information for my queries regarding the programme. Regardless, I showed them a letter from my university acknowledging me as a student from University College London and independent from district education authority.

At the beginning of the study, the main ethical concerns from this were ensuring that the participants understood that they had the right to withdraw from the research and understood the purpose of the study (Creswell, 2014). They might feel that they did not have the right to withdraw from the study because informed consent had been taken before from the head of the programme and heads of schools.

For data collection, the main ethical concerns from this were to respect the participants, to avoid deceiving participants, and to avoid collecting harmful information (Creswell, 2014). Accordingly, I explained the data collection purpose and use in the research during the interviews. I also avoided asking leading questions and sensitive information that might upset the participants.

At the data analysis, protection of confidentiality of the teachers is another key ethical issue for this study. Research studies carried out in a school setting have to maintain confidentiality because of the various stakeholders involved, such as the district education authority (Felzmann, 2009). If confidentiality is not properly maintained, teachers can be identified and this may cause social harm in their schools, especially as the study aims to collect their perspectives about the programme and information regarding their schools' support in implementing CAR. Therefore, all identifiable information such as school names and places were referenced in the report using pseudonyms to protect their identity and their schools.

4 CASE STUDY 1: CLASSROOM ACTION RESEARCH PROGRAMME VERSION I

This chapter presents the first case of this study, the impact of PD Programme Version I on teachers. Programme Version I was held by a team of university lecturers in education. It was first initiated by a professor in Education from Universitas Negeri Jakarta (UNJ), It was specifically designed not only so that teachers would be able to grasp the idea of CAR, but also to use CAR in their teaching practice. It was a three-month training programme that lasted from August until November 2018, divided into three parts: the training day, the CAR-facilitated implementation, and the presentation day. This chapter explores the impact on teacher learning and development. For each RQ, the findings from the survey observation and interview data have been combined and presented under headings reflecting the key components of the conceptual framework (see Figure 8). It is organised in six sections as follows.

Section 4.1 provides information on teachers and the reasons behind undertaking the programme.

Sections 4.2 – 4.5 provide the data for RQ1 to RQ4, with each section focusing on a key component in the conceptual framework.

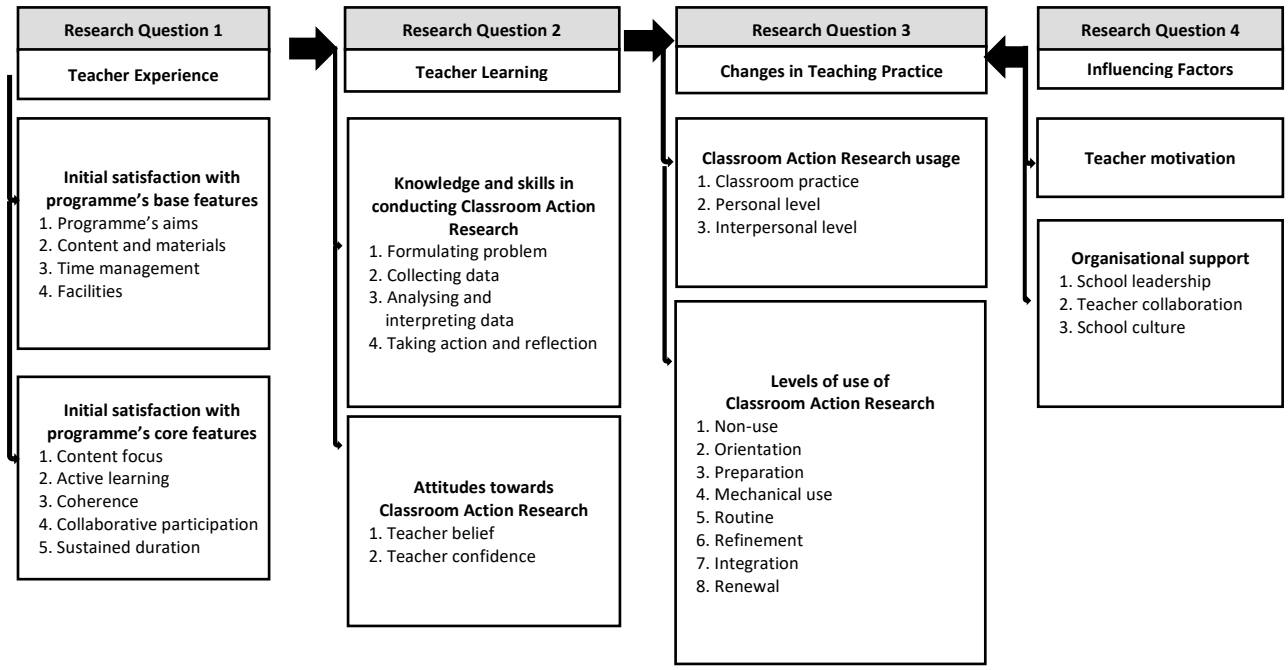


Figure 8. Conceptual framework of my study

As presented in Chapter 3, 61 out of 87 teachers responded to the survey. Of these, six were interviewed three months after the programme ended at their own schools. This chapter draws on the following data: 61 questionnaire survey responses; interview with the trainers; my observation notes; and interviews with six teachers and their CAR projects.

4.1 TEACHERS' PROFILE

This section presents six teachers' personal and professional backgrounds and seeks to find the relationships between their backgrounds and the reason they enrolled the programme. It begins with an overview of their profile and followed by their motives. The profile is tabulated in Table 6. The data shows that their professional backgrounds and experiences are varied.

The profile can be divided into three broad categories according to teachers' career. The first category consists of their degree, which is associated with their professional backgrounds acquired prior to their teaching or their early stage of teaching. The second category includes teaching subjects and qualifications, which are associated with teaching experience. The third category is the school type.

Table 6. Teachers' profile

Teachers	Degree	Teaching Qualification	Teaching Subject	School Type
Teacher A	Master's degree in Education	Senior teacher (Rank 4)	Science	Secondary Public
Teacher B	Bachelor's degree in Education	Junior teacher (Rank 3)	Literacy	Primary Private
Teacher C	Bachelor's degree in Education	New teacher (Rank 2)	Literacy	Secondary Public
Teacher D	Master's degree in Engineering	Senior teacher (Rank 4)	Engineering	Vocational Public
Teacher E	Master's degree in Education	Senior teacher (Rank 4)	Science	Secondary Private
Teacher F	Bachelor's degree in Education	New teacher (Rank 2)	Math	Secondary Public

All six teachers were graduates. Two of them had a Master degree in Education (A and E), one Master degree in Engineering (D) and the other three had a Bachelor degree in Education (B, C, and F). Three were senior teachers with Rank 4 qualification (A, D, and E), one was a junior teacher (B), and two were new teachers with low rank qualification (C and F). They taught different subjects: science, literacy, engineering and mathematics. They worked at different school types, ranging from primary to vocational (14-17 years olds). Three teachers (A, C and E) worked at public secondary schools, one (D) worked at public vocational school, one (B) worked at private primary school, and one (E) worked at private vocational school.

The 61 survey respondents identified various reasons for undertaking the programme. The survey had four yes/no response options for their motivation in following the programme: personal career development, getting new information and knowledge, head of school's order, and government requirement. Table 7 below summarises the frequencies and percentages of what teachers said their needs in following the CAR programme were.

Table 7. Teachers' responses about their purposes in following the programme (n=61)

Reasons	Frequency (percentages)
Personal career development	48 (80%)
Getting new knowledge	52 (83%)
Head of school's request	0 (0%)
Government requirement	2 (1%)

In general, 83% teachers participated in the PD programme because they wanted to get new information and knowledge and 80% wanted to develop their personal career development. Only two did because of the government requirement and none did it because they had been asked to do it by the head of school. The interviews with six teachers from the programme showed that the teachers were very motivated to attend the programme for their professional development. Four teachers (A, B, C and D) had either searched the programme on the internet or seen a leaflet in their department. Two teachers (E and F) got the programme information from their heads of school, but they willingly chose the programme.

The interview data gave more depth about why teachers had chosen this programme. Teacher D said, "*I have followed two to three CAR PD programmes, yet I still do not get the gist out of them. That is why I was motivated to follow another*". Teacher C said, "*My school does not facilitate CAR PD programme. I have to look for a programme myself. Therefore, I followed this [PD programme]*". Teacher A also said, "*I know that UNJ [the university institution running the PD programme] has a good reputation in providing PD programmes. I saw that there were many experts becoming trainers in this programme. Therefore, I hoped I could be facilitated by them*". Teacher B said, "*I was interested in following this programme because this was different than other programmes. Those programmes only gave a mere introduction and general framework of CAR; while here, not only teachers were given the knowledge of CAR, but we were also practiced conducting CAR and making its reports*".

Teachers' reasons for choosing the programme seemed to be related to their teaching experiences. Senior teachers who had Rank 4 (A, E and D) and Rank 3 (B) qualification showed confidence in CAR reasoning and theories, so they were more interested in getting information about better CAR practice. However, new teachers (C and F) who had less developed knowledge and experience in CAR wanted to increase their CAR knowledge, as well as to learn more practice. For example, Teacher D specifically wanted to get more data collection skills, while teacher F was not yet confident in conducting CAR and wanted to learn not only the practice but also the theories of CAR.

Teachers following the programme had various needs and diverse backgrounds. What they wanted from the programme varied due to their backgrounds which required different types of support. In any setting, PD programme cannot avoid the problem of having a wide range of participant expectations, as every participant is different in some way. However, it is of interest what kind of support and difficulty teachers experienced and how the programme provider had

tried to address it. Therefore, how the programme interacted with teachers' needs is an interesting issue to be investigated further.

4.2 TEACHER EXPERIENCE

This section provides information on the findings for RQ1: "what are teacher experiences of the programme?". This level represents the features or activities of a programme as the inputs or the interventions (see Figure 8). It explores teachers' individual experience and views of the programme. It begins with analysing teachers' views on the base features of the programme: its aims, content, time management and facilities, followed by analysing teachers' view on the core features of the programme: active learning, collaboration, content focus, coherence, and sustained duration.

4.2.1 Programme's base features

This section explores teachers' views of the base features of the programme: its aims, content, time management and facilities. To do this, various sources of data were used, including: the programme details form and data from observation, questionnaire responses and interviews with the head of the programme and participants.

Programme's aims

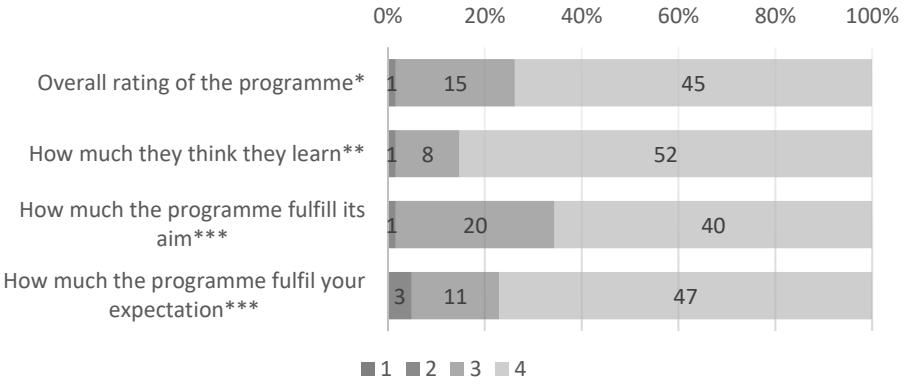
The programme details form showed that the programme aimed to help all teachers to improve their skills and understanding of CAR and develop greater confidence and competence in conducting CAR. The provider commented that "*Because a lot of new teachers do not know about research very well and consequently do not use it very confidently or with much enjoyment, the programme was designed within considerable constraints to try and reflect both of those possibilities*". Apart from training teachers, the programme had another purpose from the provider's point of view. His purposes are providing mentorship via face-to-face meeting as well as online in the form of a Whatsapp group and emails and getting feedback on the groups, which were developed to support teachers to improve their ability to conduct research. The programme details form showed that the intended participants for the programme were all teachers. The range of the intended participants was overly broad and implied a challenge for the programme provider to meet their various needs. In reality, as presented in the previous section, teachers had a wide range of professional backgrounds. They came to the programme with their own specific expectations, which proved to be quite different. However, the survey and interview data show that the aims of the programme are consistent with teachers' motivations to improve their subject knowledge and practical skills to conduct CAR confidently.

The teachers' immediate responses to the programme were incredibly positive. It is shown from the survey analysis below that teachers' overall rating of the programme and how much they thought they learnt have a relatively high mean score of 3.72 and 3.84 with the modal score of 4. Moreover, teachers also thought that the programme fully met its aims and their expectations.

It is shown from the survey analysis below that the programme's aims and teachers' expectations were met with relatively high mean scores of 3.66 and 3.72 with a modal score of 4.

Table 8. Mean and standard deviation of teachers' initial response to the programme (n=61)

Teachers' response	Mean (SD)
Overall rating of the programme*	3.72 (.46)
How much they think they learn**	3.84 (.48)
How useful was the programme in fulfilling its aims***	3.66 (.40)
How useful was the programme in fulfilling your expectation***	3.72 (.44)



* four-point scale, rating from 1= 'not satisfied' to 4= 'very satisfied'
** four-point scale, rating from 1= 'nothing' to 4= 'very much'
*** four-point scale, rating from 1= 'nothing' to 4= 'fully'

Figure 9. Teachers' initial response to the programme

Based on the interview data, all teachers had very positive responses to the programme. They said that they were happy to take the programme and they would recommend the programme to other teachers. Both new and experienced teachers valued the programme very highly. They particularly appreciated that the programme created groups, provided mentors and helped them to conduct CAR confidently. Amongst the six teachers, Teacher A expressed her satisfaction as "*Superb programme. No programme has ever been as useful to me since I have been conducting CAR as this one*". Other teachers similarly reported that they enjoyed the programme, cleared up their misunderstandings and had better understanding of CAR. During the programme, teachers were given opportunities for active engagement, discussion and reflection to challenge their existing understanding. The programme also provided useful strategies and resources for CAR practice. As a result, they had more confidence and enthusiasm in conducting CAR.

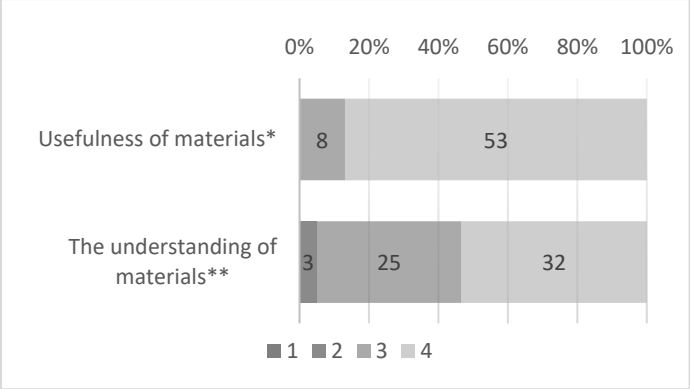
Contents and materials

In the programme details form, three main topics were lectured: Reasoning and importance of CAR, Conducting CAR, and Making CAR proposal and report. According to the observation of the programme, regarding the first topic of the programme, the provider asked a lot of diagnostic questions that helped explain the reasoning and importance of CAR. For example, the provider asked teachers, "Why is CAR important to teachers?". Teachers were sometimes not able to give correct answers at the beginning, but they were gradually able to give appropriate answers. For the second topic, the provider presented several video clips which showed good CAR models and activities to help teachers understanding. Regarding the third topic, the provider did not suggest particular activities or strategies, but taught writing skills indirectly by providing exemplary lessons. In addition, the provider spent considerable time in hands-on activities by providing workshop and presenting relevant demonstrations during the programme. Teachers were put into groups based on their area of expertise. The materials also contained updates of recent developments of CAR in Indonesia, such as the using of journals instead of old books as references. However, analysis of the CAR reports showed that many teachers still used outdated references instead of more recent journal papers. From the programme provider's perspective, he focused on the reasoning and importance of CAR and conducting CAR, rather than drafting the report. He explained, "*We designed the materials ideally in a flow by giving motivation, explaining the concept, building two-way discussions, and facilitating the implementation of CAR. Besides, we also shared the common misconceptions in conducting CAR. For example, many teachers think that CAR is just a one-cycle research or experiment, while in truth, it is a repeated cycle to improve their teaching practice*".

The questionnaire surveys show that teachers thought that the content materials were useful and easy to understand. The mean score of the usefulness of materials is 3.87 with the modal score of 4. This means teachers mostly agreed with the statement that the content materials were useful. The mean score of the understanding of materials is a relatively high score of 3.48 with the modal score of 4, which means teachers found that the materials were easy to understand. Moreover, the interviews with teachers showed a deeper understanding of how teachers perceived the materials from the programme. Before elaborating on these topics, the mean and standard deviation of the content materials are presented in Table 9.

Table 9. Mean and standard deviation of the questionnaire on teachers' response to the programme materials (n=61)

Programme Materials	Mean (SD)
Usefulness of materials*	3.87 (.46)
The understanding of materials**	3.48 (.68)



* four-point scale, rating from 1= 'not useful' to 4= 'totally useful'
** four-point scale, rating from 1= 'hard to understand' to 4= 'easy to understand'

Figure 10. Teachers' response to the programme materials (n=61)

Based on the interview data, teachers' immediate responses were very positive. The materials were highly valued as their reference and helped them to understand CAR better. They saw the materials as an especially useful guide: very detailed and practical. However, they were also challenging due to the large amount of content. Each teacher rated distinct aspects of the materials as the most useful and some of them seemed to be related to their different expectations and contexts. Two teachers (C and F) appreciated the reasoning and importance of CAR as they had never attended any CAR programme before. One added, "*There were many materials that I had not learnt before".* Teacher E felt her ways of thinking and writing CAR report were challenged by the provider, and that this was the most useful aspect. Teacher A said, "*I got new knowledge that I could use to update my own (CAR) research*". Two reported that the workshop also provided useful materials. Teacher B valued idea sharing the most and she might have considered new ideas for his research. In Teacher A's words, "*My mentor gave me a few indications and examples of research methods to use so I could match it with specific topics or problems that I want to conduct the research*".

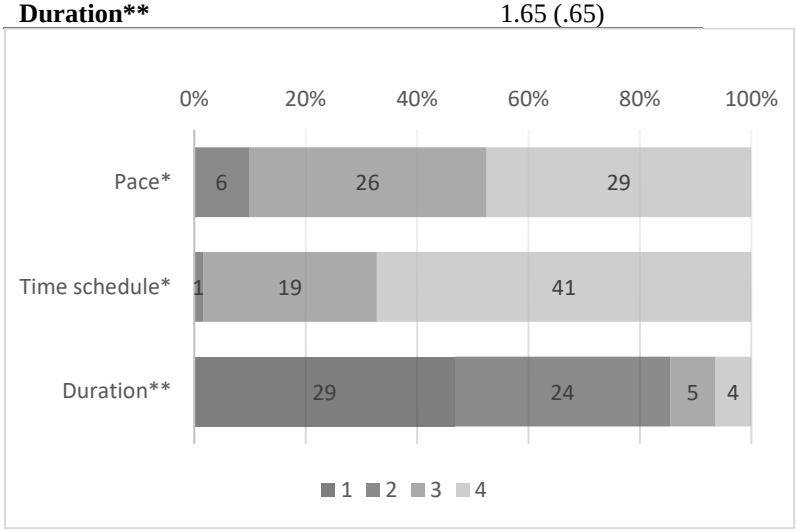
Time management

The programme was spread over three months, from August until November 2018. It was divided into three parts: the training day (one day), the CAR-facilitated implementation (three months), and the presentation day of their CAR reports supervised by the mentors (one day). On the training day, there were two sessions: seminar and workshop. From the programme provider's point of view, one day training was not enough time to deal with all topics properly. As the programme was particularly challenging dealing with all topics in one day, there was little time for the provider to fully meet every teacher's individual CAR problem, arising from their diverse backgrounds. In the interview, the provider pointed out that "*trying to do the whole programme in one day is simply unwise*". Consequently, they extended into a three-month facilitation programme as they wanted to optimise the practice of CAR by having mentors facilitating teachers' CAR activities. These mentors were professionals assigned to a group of teachers for supervising them in conducting CAR during the programme, such as helping formulate the CAR problems, analysing the data acquired, and facilitating the teachers in giving answers to their questions regarding their CAR projects.

Teachers had to do this programme in their time. It is consequently important to measure the time management to know if such sacrifice is worth their time. Time management of the programme in the training day was divided into three variables: pace, time schedule and duration. The mean and standard deviation of the time management are presented in Table 10 below.

Table 10. Mean and standard deviation of the questionnaire on teachers' response to the time management of the programme (n=61)

Time management	Mean (SD)
Pace*	3.38 (.60)
Time schedule*	3.66 (.53)
Duration**	1.65 (.65)



* four-point scale, rating from 1= 'very bad' to 4= 'very good.'
** four-point scale, rating from 1= 'too short' to 4= 'very good''

Figure 11. Teachers' response to time management of the programme (n=61)

The pace of the programme in the training day received a relatively high mean score of 3.38 with the modal score of 4. This means teachers were satisfied with the pace of the programme. For the time schedule, the mean score is also relatively high of 3.66 with the modal score of 4, as teachers were content with the scheduled time the programme offered in the training day. However, the mean score of duration was relatively low of 1.65. This is because teachers thought that the first day of the programme was noticeably short in duration. Moreover, the interviews of teachers showed a deeper understanding of how teachers perceived time management from the programme.

The interview data revealed that most teachers were satisfied with the duration and time management of the whole programme. Meanwhile, a few of them (E and F) were not, especially the duration of the first training day. As Teacher F said, "*Honestly, I think the training was too short. I wish it was held for two to three days so that we could really understand and grasp the knowledge. I even do not mind if I have to pay (the participation fee) more".* They pointed out that more time was needed for the first day of the programme. They suggested that it needed to

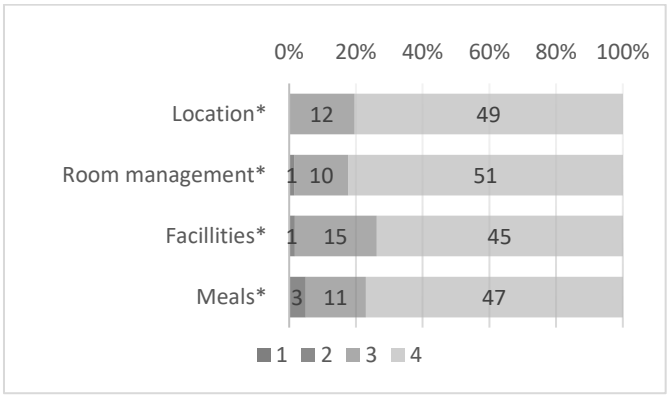
be longer to improve the whole programme and suggested splitting the course into two or three different courses according to topics, rather than trying to cover all the topics on one course. However, teacher C also thought it was unrealistic because they might not be able to attend such a long PD course.

Facilities

The facilities of the programme in the training day were taken into account as it is important to measure its worth with what teachers had spent to follow the programme. The facilities of the survey analysis was divided into four variables: room management, location, building facilities and meals. Table 11 below presents the mean and standard deviation of view about the facilities.

Table 11. Mean and standard deviation of the questionnaire on teachers' response to the programme facilities (n=61)

Facilities	Mean (SD)
Location*	3.80 (.41)
Room management*	3.86 (.43)
Building facilities*	3.72 (.55)
Meals*	3.72 (.52)



* four-point scale, rating from 1= 'very bad' to 4= 'very good

Figure 12. Teachers' response to the programme facilities (n=61)

Overall, teachers were satisfied with the room management, location, building facilities and meals of programme. This is shown from the relatively high mean score of each variable: room management with 3.80, location with 3.86, building facilities with 3.72 and meals with 3.72 and all with the modal score of 4. Moreover, the interview of teachers showed a deeper understanding of how teachers perceived the facilities from the programme.

The programme was held in the institution's university located in the east part of Jakarta. It was a famous university, easy to access due to many public transportations having routes in the area, and conducive for learning activities. Since the teachers lived in various areas, Teacher C needed to rent a stay nearby as he lived outside Jakarta. However, he did not mind as the

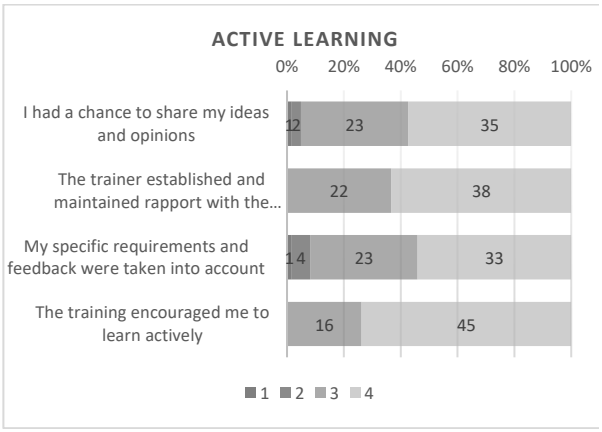
programme was held on a weekend. The first session was held at the auditorium with the capacity of 90 people fit enough for the 87 participants but with the seating arrangement in rows, making it harder to see the PowerPoint presentation and/or to hear the trainer's voice, especially those seated in the back. The second session was held in a different hall with the seats grouped around tables, making it easier to discuss with the mentors and each other. Everyone in the programme were given a meal, hot beverages (tea and coffee) and snacks. Overall, both trainers and teachers were satisfied with the facilities of the training programme.

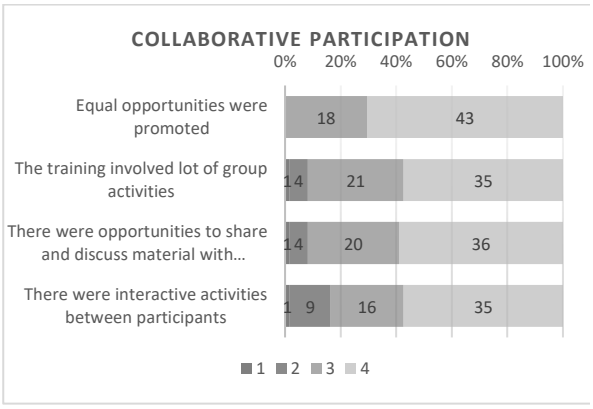
4.2.2 Programme's core features

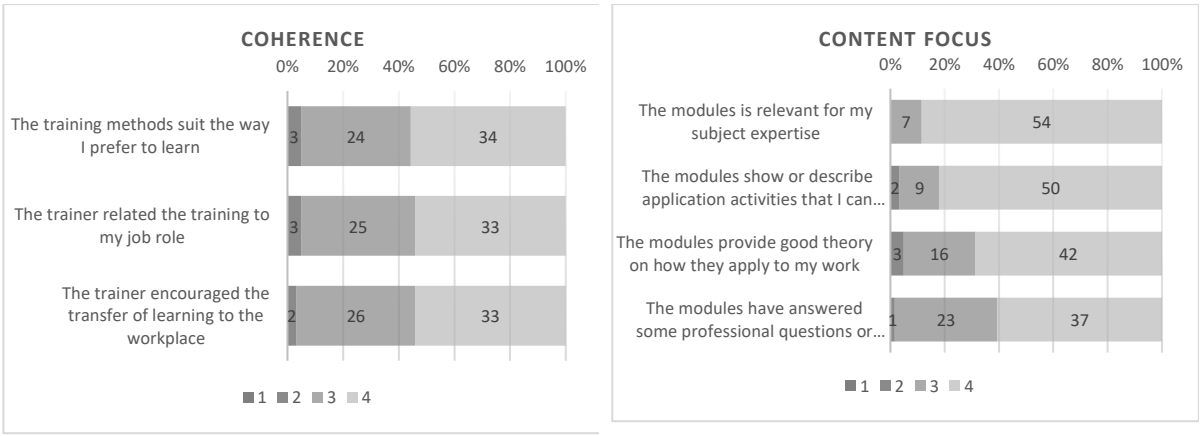
Based on the conceptual framework, the core programme features were divided into five variables: (1) active learning, (2) collaboration, (3) content focus, (4) coherence, and (5) sustained duration. However, sustained duration was not included in the survey analysis because the sustainability of the programme had not yet occurred at the time the survey was administered as it was taken after the training day. The mean and standard deviation of the programme features are presented in Table 12 below.

Table 12. Mean and standard deviation of the questionnaire on teachers' response to the core features of the programme (n=61)

Programme features	Mean (SD)
Active learning*	3.62 (.38)
Collaborative participation*	3.58 (.22)
Content focus*	3.75 (.11)
Coherence*	3.55 (.47)







* four-point scale, rating from 1= 'totally disagree' to 4= 'totally agree'

Figure 13. Teachers' response to the statements about core features of the programme (n=61)

Teachers' view on active learning received a mean score of 3.62 out of 4. This is a relatively high score which means teachers generally agreed that active learning occurred during the programme. For example, most of teachers agreed with statements such as: "*The trainer established and maintained rapport with the participants*" and "*The programme encouraged me to learn actively*". Concerning collaboration, most of the teahers agreed with statements such as: "*The programme involved a lot of group activities*" and "*There were opportunities to share and discuss material with colleagues*". It is noteworthy that collaboration received a relatively high mean score of 3.58. Regarding coherence, most teachers agreed that the programme's methods suited the way they preferred to learn and with their role in their workplace. It is shown in the mean score of coherence which reached a relatively high mean score of 3.75. Finally, the content focus received a mean score of 3.55. This is also a relatively high score, meaning that teachers generally agreed that the programme was content-focused. For example, most of teachers agreed with statements such as: "*The programme shows or describes application activities that I can readily implement in my classroom*" and "*The programme is relevant to my subject matter*".

The next section reports the analyses from the interviews with teachers based on the five variables of the programme features from the conceptual framework.

Content focus

The programme was a partly content-focused training course. The reason is because Session I contained seminar which was about general knowledge of CAR without having specific subject knowledge of the teachers, while in Session II and the follow-up programme, teachers were divided into groups of their area of expertise. Teacher A and E appreciated understanding the reasoning behind CAR the most. For example, when the provider demonstrated the practice of CAR and explained related theories, both had been practicing CAR for more than 2 years. As they had considerable experience of conducting CAR, they were likely to be familiar with the practice, but they might have forgotten the understanding of CAR theories and therefore the provider's explanations helped them understand the concepts clearly. Moreover, the interview

data with Teacher F also revealed that teachers learnt from not only what was introduced but also from how it was presented. Sometimes, the latter can have more impact on teacher learning because it can be adapted directly to their CAR practice. Teacher D found the workshop session was useful because he picked the engineering topic in the classroom, He shared in the interview, "*I currently have a CAR project going on using a method that I now knew is outdated. This programme introduced me to new engineering methods that I could use better in my CAR project*". The programme provider tackled the different teachers' needs by wisely putting mentors in the programme. The head of the programme confirmed such focus as he said, "*By assigning the mentors to these groups of teachers with the same expertise helped teachers in answering any subject knowledge-related problems in their CAR projects*".

Active learning

The main activity that encouraged active participation was the workshop in the second session of the first day. The first session was only a seminar with Q&A session by the end of the session. In the workshop, teachers were divided into groups based on their area of expertise and asked to find a couple of problems of their own and discussed it with the others while being facilitated by a mentor in each group to finally formulate the actual problem. These mentors facilitated teachers and maintained their active learning not only during this workshop session, but also during the three-month CAR practice facilitation period, having such mentorship done via online of a Whatsapp group and emails and also face-to-face meeting if needed. The head of the programme explained, "*Workshop activities were intended to encourage teachers to take the first step of their own research. It was important for teachers to learn actively*". Most teachers thought the workshop activities were the most useful. As the programme dealt with hands-on problem formulation, teachers' responses to the most useful aspect were more focused on the practical aspects of planning CAR. Teacher B's comments supported this, "*There were a lot of active participation, especially during the workshop. That was the learning-by-doing moment as we really expressed our mind. During the seminar, we only listened; but in workshop, we could learn what we really need into our teaching*". Teacher A also commented, "*I think the programme was really good, having to learn not only the concept, but also the practice implementation. While the other programmes I followed before only offered the concept without the practice so there was less active participation*". In addition, most teachers wanted to have different experience and to get more hands-on on collecting and analysing data. One teacher suggested more opportunities for them to try to analyse data, while another wanted practical activities in collecting data. As some teachers wanted to concentrate on the workshop, they thought other activities were less useful. For example, Teacher D wanted to spend more time on practice rather than listening to the seminar. Teacher E also mentioned that there was no need to spend time on the seminar which was straightforward. Nevertheless, they still valued the seminar as an important part of the programme. However, they valued trying hands-on by themselves more, because they could know new practice and have more confidence in conducting them.

Coherence

The programme was coherent with teachers' expectations and prior understanding about CAR. It was reflected in Teacher A saying, "*I followed the programme because I wanted to start my CAR project and this programme helped me in achieving that*". Another perspective from Teacher D, "*I am in the middle of my CAR project. I hoped I could update the quality of my research. The programme successfully gave new insights for me to improve the research*". The trainers confirmed such coherence by saying, "*This programme was designed to tailor teachers' needs and prior understanding about CAR, specifically by assigning mentors within their area of expertise to facilitate them in developing their CAR projects*". This implies that teachers' expectations were similar with the aim of the programme, as to the useful aspects of the programme tended to reflect their expectations of the programme. However, in some cases, teachers' views on the coherent aspect of the programme in the interviews had slightly changed according to whether they had the opportunity to use them in their schools. For example, Teacher C mentioned the lecture about the reasoning and importance of CAR as the most valuable in the programme as she were starting the project, but her view had changed to a lecture about how to conduct CAR as she found it the most important of actual practice for CAR. Most teachers valued different aspects of the programme according to their needs, including: better understanding, expanding their practical activities, more confidence and competence in conducting CAR.

Collaborative participation

The programme had collaborative activities, especially in the workshop session. The trainer explained, "*Teachers were divided into groups based on their area of expertise so that they could share and discuss a lot of common problems and solutions in their own area*". Teacher A commented, "*During the practice, there were sharing and interactions with other teachers. The other programmes I followed before, there was only seminar without interaction as there was no practice*". Teacher B said, "*The group division helped us to share with each other. However, there were less teachers from vocational schools following the training, only four to five teachers. I think the more teachers, the better the collaboration*". Even Teacher D shared that the communication he developed with other teachers felt familiar as they were from the same area of expertise. He valued sharing experiences and difficulties with other teachers during the programme. This reflects his situation in his department where he could not find any teacher to discuss CAR activities. In addition, three interviewees (Teacher C, E and F) highly valued the opportunity of discussing and sharing how to conduct CAR with other teachers. Three months after the training day, teachers tended to value the opportunity to discuss with other teachers more than immediately after the programme. They might have experienced the benefits of discussing CAR with others, which helped them reflect on their CAR and provided them with detailed guidance for better research work. However, it could also be interpreted that teachers had not had enough opportunities to discuss their CAR with their colleagues in their schools.

Sustained duration

The programme has sustained duration for a period of three months after the training day. During those months, teachers were followed up by their mentors about their CAR projects through emails, Whatsapp group, and/or one-to-one meetings. The head of the programme explained, "*The main goal is that teachers were able to create at least one CAR project and report during this given time. Also, that was why we set a target at the end of the programme asking teachers to present their report on the presentation day*". Teachers confirmed about the sustained duration. All of them were satisfied that there were follow-ups from their mentors. Teacher A said, "*I still keep in touch with my mentor. He responded to my problems very well. He gave feedbacks to my data collection, like the video I recorded during my teaching*". Teacher B also commented, "*The group formed after the training helped me in following up my progress*". Most teachers' immediate suggestion for improving the programme was to extend the facilitation duration to deal with all the problems of the CAR for an entire year. They can keep improving their own research with an expert guidance.

4.2.3 Summary

This section summarised the overall teachers' experience and views of the programme. Regarding the aims of the programme which were to improve practical skills and understanding of CAR and develop greater confidence and competence in conducting CAR, the programme precisely met teachers' needs. Teachers showed very positive responses to the programme immediately after the programme ended. Their immediate responses depended on whether their expectations of the programme were met during the programme. The challenge between the programme's aims and the various teachers' needs seemed to be resolved by the strategies and resources used by the provider. Firstly, as there was a mixture of teachers who had different backgrounds and needs as participants, the provider tried to maintain their flexibility by providing mentorship and getting feedbacks on the groups. The mentors could then respond to teachers' needs which were developed to support teachers to improve their ability to conduct CAR. Secondly, the provider extended the programme into a three-month facilitation programme as they wanted to carry out the practice of CAR by having mentors facilitating teachers' CAR activities. Teachers particularly appreciated that the programme created groups and provided mentors available and helped them conduct CAR confidently after the programme. Third, the content materials were highly valued as their reference and helped them understand CAR better. From the teachers' perspective, they saw the materials as a very useful guide: very detailed and practical. Each teacher rated different aspects of the materials as the most useful and some of them seemed to be related to their different expectations and contexts. Finally, teachers were also satisfied with the time management, location, and building facilities of the programme. However, few of them pointed out that more time was needed for the first day of the programme. They suggested that it needed to be longer to improve the whole programme.

Data showed that the strategies and engagement of the programme are consistent with all the five core features of PD programme to promote conditions for teacher learning. Firstly, during the programme, teachers were given opportunities for active engagement. The main activities

that encouraged active participation were in the workshop session, where teachers were asked to find a couple of problems of their own and discuss them with others while being facilitated by each mentor to finally formulate the actual problem. Teachers valued trying hands-on by themselves more, because they could know new practice and have more confidence in conducting them. Secondly, collaboration was encouraged in the programme. Teachers were divided into groups based on their area of expertise so that they could share and discuss a lot of common problems and solutions in their own area. Teachers highly valued the opportunity of discussing and sharing how to conduct CAR with other teachers, especially during the three months facilitation. They might have experienced the benefits of discussing CAR with others, which helped them reflect on their CAR projects and provided them with detailed guidance for better research work. Next, the programme was coherent with teachers' expectations and prior understanding about CAR. It was reflected from teachers' views to the useful aspects of the programme tended to reflect their expectations of the programme. Most teachers valued different aspects of the programme according to their needs, including: better understanding, expanding their practical activities, more confidence and competence in conducting CAR. Next, the programme also provided content focus strategies and resources for teachers specifically in their different area of expertise by assigning mentors to these groups of teachers with the same expertise to helped solve any knowledge-related problems from teachers' CAR projects. Besides, teachers also appreciated trainer's explanations on the training day in understanding the reasoning behind CAR clearly. Finally, the programme has sustained duration for a period of three months after the training day. During those months, teachers were followed up by their mentors about their CAR project through emails, Whatsapp group, and/or one-to-one meetings. Most teachers' immediate suggestion for improving the programme was to extend the facilitation duration so that mentors could help their CAR projects for an entire year to improve their own research with an expert guidance.

4.3 TEACHER LEARNING

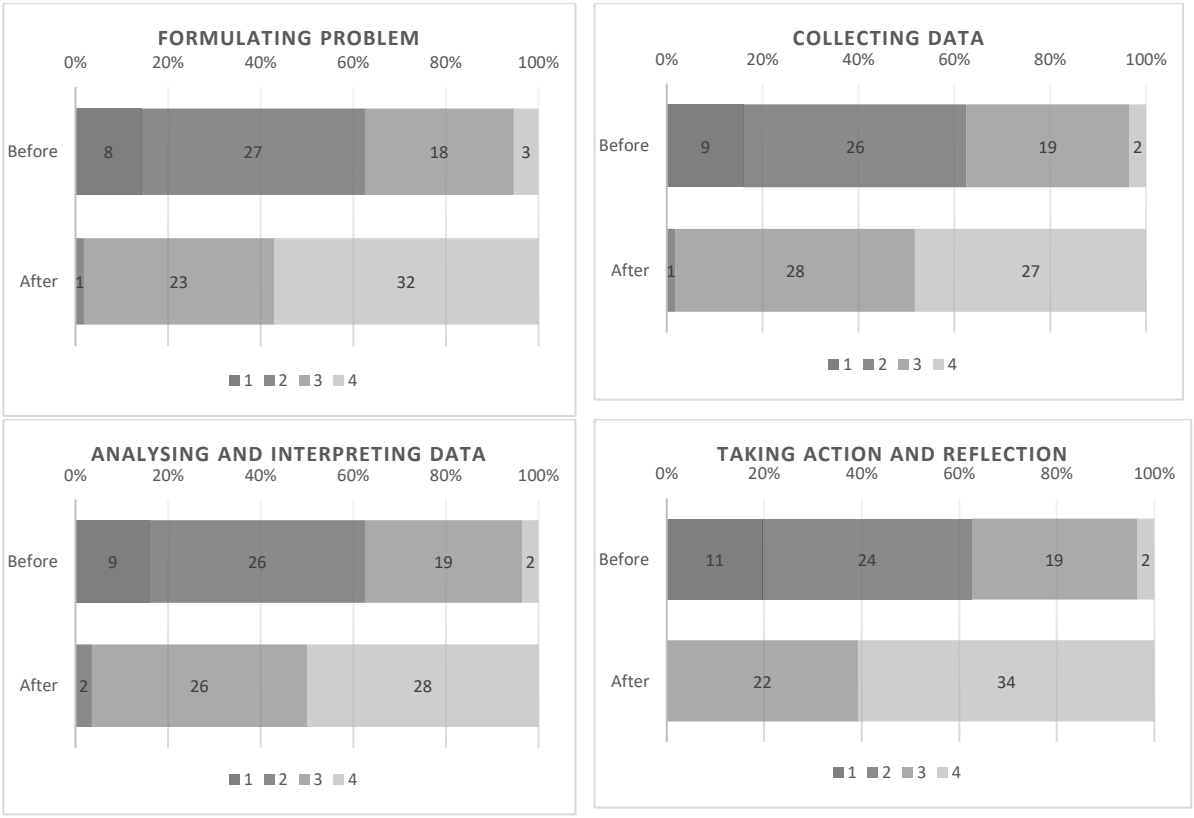
This section provides information on the findings for RQ2, "What do teachers learn from the programme?". This level is considered as the pre-condition that enable the attainment of the final outcomes which are the changes in teaching practice (see Figure 8). It identifies the increase in teachers' knowledge and skills and the changed attitudes towards CAR, that might enable them to change their practice.

4.3.1 Knowledge and Skills in conducting CAR

Based on the conceptual framework, the impact of the programme on teachers' knowledge and skills in relation to CAR was divided into four variables: (1) formulating a problem, (2) collecting data, (3) analysing and interpreting data, and (4) taking action and reflection. The mean and standard deviation on teachers' response to their knowledge and skills before and after of each programme are presented in Table 13 below.

Table 13. Mean and standard deviation of questionnaire on teachers' response to their own knowledge and skills before and after the programme (n=61)

	Mean (SD)	
	Before	**After**
Formulating problem	2.29 (.78)	3.55 (.53)
Collecting data	2.25 (.76)	3.46 (.54)
Analysing and interpreting data	2.25 (.76)	3.46 (.57)
Taking action and reflection	2.21 (.80)	3.61 (.49)



* four-point scale, rating from 1= 'No knowledge and skills' to 4= 'very good

Figure 14. Teachers' response to their knowledge and skills before and after the programme (n=61).

Regarding how to formulate a problem, teachers' response in their changes received a relatively high mean score of 3.55 with the modal score of 4. This means more than half of teachers from the programme claimed that their problem formulation was very good after the programme. Concerning how to collect data, it received a relatively high mean score of 3.46 with the modal score of 3, meaning teachers generally claimed that their data collection knowledge and skills were good after the programme. About data analysis, it received a relatively high mean score of 3.46 with the modal score of 4, meaning half of teachers claimed that their data collection knowledge and skills were exceptionally good after the programme. Concerning action-taking and reflection, it received a relatively high mean score of 3.61 with the modal score of 4. It

means more than half the teachers agreed that their taking action and reflection knowledge and skills were very good after the programme. Finally, although the mean score of all knowledge and skills after the programme is relatively higher than before the programme, there is no significant difference between them.

The next section reports the analyses from the interviews with teachers based on the four variables of knowledge and skills from the conceptual framework.

Formulating problem

All teachers I interviewed reported that they were able not only to grasp the idea of problem formulation, but also did it themselves during the programme. This is because by the end of the session, there was a workshop where teachers were asked to begin their own problem formulation for their own research, supervised by mentors. As teacher A said, "*The programme was really good, we were facilitated to formulate the problem on the spot and the tutorial was personal*". She thought that the programme improved her practical aspect of formulating problems. Another teacher (teacher C) shared her experience, "*During workshop, with the help of my mentor, I formulated a problem in my classroom about how science and technology impact students' interest in learning*". She reported she learnt about "the basics of the problem formulation and how to design one now". Teacher B also shared that because of the grouping in the workshop impacting him being able to share his teaching experience with other teachers, he realised that some students had difficulties in particular areas, consequently, he formulated about the effect of students' background towards their motivation in learning. He gained a better understanding of the problem and acquired better CAR strategies and skills from the programme. Teachers having the same views on the impact of the programme on their problem formulation reported that their practical skills improved as a result of attending the programme. During the programme, they could try experiments which they had not used before, and this helped them carry out those experiments in their problem formulation.

Collecting data

In this programme, all teachers learnt new knowledge about data collection that made them understand data collection techniques. According to their statements during interviews, they improved the data collection knowledge during and after the programme with the help of their mentors. Then, they changed their technique based on their improved knowledge. Teacher D said "*I did not know anything about data collection before I went on the programme, I did not understand it. And having been on the programme, having worked through the workshop and group, I felt confident enough to actually try it and put it into practice*." Teacher C said, "*I usually only used student reports as my data, but after this programme, my instruments were improved as now I also interview and observe students and ask them to make a portfolio of their homework*". Teacher D even used technology to collect data by using online questionnaires and online observation notes. All teachers claimed they used student results or pre-tests and post-tests as their instruments. Moreover, there were also teachers using observation rubrics, photos and videos as an addition. As teacher B said, "*I used my own handwriting, photos and videos, also observation rubrics as data for my research"* and teacher A added, "*I collect these on daily*

basis, so whenever I need I can use them right away". Overall, teachers had developed data collection knowledge and skills, so those with considerable difficulty in understanding data collection were helped by the mentor to identify their weaknesses. However, different teachers found new knowledge in different techniques, they changed their knowledge of what practice they could test, and, therefore, there is a different impact for each teacher.

Analysing and interpreting data

In analysing and interpreting data, teachers not only showed that they understood theories of data analysis and interpretation, but they were also able to grasp the concept and to practice it. During interviews, three teachers (C, D and E) shared that the programme included some ideas for analysing data such as developing assessment tools as one way to analyse students' achievement. The most common method that teachers used is comparing student results between pre-test and post-test. There were some teachers who claimed that they had improved their data analysis and interpretation. Teacher C said she "*tracked the increase of students' performance by using rubric, which valued cognitive and psychomotor ability according to the respective criteria and learning indicators*. Another teacher (teacher A) said, "*Before the programme, I used to make a simple analysis by only using simple comparison of student results, now I made a comprehensive kind of analysis so my research is eligible to be published in a journal"*. The most important part that teachers claimed of this programme is that teachers were facilitated by mentors during data analysis and interpretation process after the programme. Teacher B mentioned, "*I got facilitated in how to analyse and interpret data [during the programme]. I sent videos and photos of my data to my mentor and he responded to me and gave feedback very well*". All teachers admitted that their mentor was helpful in identifying and correcting their weaknesses in analysing and interpreting data. Teachers' misconceptions were initially identified by some diagnostic questions and discussions with their mentor and other teachers in group.

Taking action and reflection

All teachers changed their knowledge and skills about the last CAR cycle *i.e.* action-taking and reflection that made them improve their own research. However, teachers found different new knowledge of different techniques and tried out their new practice, which consequently, had different impacts or changes among teachers. Teacher A explained that she usually only did one cycle of CAR and she realised after the programme that CAR was supposed to be done more than one cycle to refine their teaching methods. Teacher A seemed to be aware of the different uses for multiple cycles. She pointed out that the demonstration and experiments presented in the previous cycle can be adapted to another classroom situation. She shared that she was able to perform the same demonstrations and experiments in different classrooms and the result seemed to reassure her and confirm the best classroom situation for her experiment. There were other various actions that teachers had taken by using multiple cycles. For example, Teacher B already prepared a couple of methods of teaching and planned to apply the method one by one until the solution could be sought and found. He reported, "*Based on my previous CAR result, I used a different method with the same group of students as a refinement to my previous method. I repeated the cycle two to three times*". Another example, teacher C said, "*I*

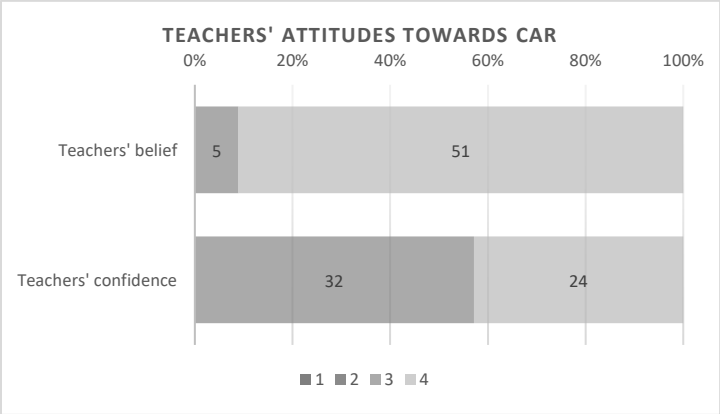
made a rotation of my classroom management based on my CAR result; for example, about the grouping of students I rotated some excellent students to help the other students because I learnt that students are more comfortable to learn with their classmates". teacher C who investigated students lacking motivation took the next step of his research by approaching their parents to discuss their motivation. All teachers shared the same view on the impact of their mentor and group to their reflection and taking action knowledge. They reported that their action reassured and improved as a result of the group facilitation. During their CAR project, they tried new experiments that they had not used before and discussed their progress with other teachers in their group. All teachers thought of the way the mentor helped them in identifying the misunderstandings of their CAR project's reflection and action.

4.3.2 Attitudes towards CAR

Based on the conceptual framework, the impact of the programme on attitudes towards CAR were divided into two variables: (1) teachers' beliefs, and (2) teachers' confidence. The mean and standard deviation of teachers' response on how far attitudes towards CAR improved are presented in Table 14 below.

Table 14. Mean and standard deviation of the questionnaire on teachers' response about their attitudes towards CAR after following the programme (n=61).

Attitudes towards CAR	**Mean (SD)**
Teachers' belief*	3.91 (.28)
Teachers' confidence**	3.43 (.49)
Impact on attitudes towards CAR	3.55 (.50)



* four-point scale, rating from 1= 'not important to 4= 'very important'
** four-point scale, rating from 1= 'not confident to 4= 'very confident'

Figure 15. Teachers' response to their knowledge and skills before and after the programme (n=61)

Concerning attitudes towards CAR, teachers' belief on CAR received a relatively high score of 3.91 with modal score of 4. This means teachers generally agreed that they believe on the

importance of CAR. Meanwhile, teachers' confidence also received a relatively high mean score, even though not as high as teachers' belief, of 3.43 with modal score of 3. This also means that teachers generally agreed on their confidence in conducting CAR. However, regarding the difference between teachers' attitudes towards CAR before and after the programme, it received a relatively high mean score of 3.55 with modal score of 4. This means teachers generally agreed that the programme had a greater impact on their attitudes towards CAR.

The next section reports the analyses from the interviews based on the two variables of the teachers' attitudes towards CAR from the conceptual framework.

Teachers' belief

Regarding teachers' belief towards CAR, all teachers mentioned that they already believed in CAR's importance before the programme. However, teachers' situation considerably influenced their belief in the importance of CAR. Although most teachers found CAR important to improve teaching practice, four of them who already conducted CAR before mentioned CAR was also important for their personal development. As teacher D said, "*CAR is a solution to me as it is not just like some research experiment to improve teaching practice. It gives real impact to my personal development".* Besides that, some teachers also believed in the importance of their research data or evidence. Teacher A even argued, "*CAR is important because human memories are limited. That is why the report and data I have will help me remember the mistakes I have made*". Conclusively, most teachers already had their belief towards CAR and consequently, the impact of the programme on their belief was not significant. Nevertheless, the result of their belief towards CAR after the programme was still remarkably high.

Teachers' confidence

Teachers reported that their confidence in conducting CAR had considerably improved compared to their confidence before the programme. They claimed that what made them more confident was because their needs and expectations were fulfilled. The favoured part of the programme according to them was the workshop. Three interviewees (C, E and F) found the workshop was useful because the hands-on activities made them more confident. Moreover, all teachers reported that the group and mentor were the main strategies which contributed to their improvement in confidence. Whenever they had doubts, they shared them in the group and had their mentor help them to identify their mistake.

4.3.3 Summary

This section summarised the overall teachers' changes in knowledge, skills and attitudes towards CAR. Teachers' changes in knowledge and skills of CAR involved four aspects of changes: formulating problem; collecting data; analysing and interpreting data; reflecting and taking action. Data showed that all teachers had considerably improved their knowledge and skills on all four aspects. Changes in problem formulation skills were the most eminent

outcome. Teachers were able not only to grasp the knowledge of problem formulation, but also did it themselves during the programme. This is because by the end of the session, there was a workshop where teachers were asked to begin their own problem formulation for their own CAR projects. During the programme, they could try experiments which they had not used before, and this helped them carry out those experiments in their problem formulation. Moreover, the degree of change depends on teachers and their situation. For example, changes in data collection knowledge and skills, different teachers found new knowledge in different techniques, they changed their knowledge of what practice they could test, and, therefore, there is a different impact between teachers' changes. Finally, the most important part that teachers claimed of this programme is that teachers were facilitated by mentors. This was reflected in their changes in analysing data, reflecting and taking action. All teachers admitted that their mentors were helpful in identifying and correcting their weaknesses in analysing and interpreting data. Teachers' misconceptions were initially identified by some diagnostic questions and discussions with their mentors. They also reported that their actions reassured and improved as a result of the group facilitation. During their CAR projects, they tried new experiments that they had not used before and discussed and reflected their progress with other teachers in their group. On the other hand, regarding teachers' belief towards CAR, most teachers already had their belief towards CAR and, thus, the impact of the programme on their belief was not significant. Meanwhile, teachers reported that their confidence in conducting CAR had considerably improved compared to their confidence before the programme. Similar to their changes in knowledge and skills, all teachers reported that the groups and mentors were the main strategies which contributed to their improvement in confidence. Whenever they had doubts, they shared them in their group and had their mentors help them to gain their confidence. However, the extent to which the programme had an impact on teacher's changes in knowledge, skills and attitudes towards CAR depended on teachers' prior experiences, the type of activities they experienced during the programme, the school context and how they linked the programme to these conditions. This was discussed and elaborated more in the discussion chapter.

4.4 INFLUENCING FACTORS

This section analyses and discusses the findings for RQ3: "What are the organisational factors in schools that promote or hinder teachers in using CAR to improve their teaching practice?". This outlines how schools act as a promoting or hindering factor in the implementation of the programme. These factors are variables in the external environment of the programme (school and wider environment) that regulate how interventions are implemented and explain why similar intervention activities have diverse outcomes across different individuals (see Figure 8). Based on the conceptual framework, the impacts of the influencing factors in schools that promote or hinder teachers in using CAR were divided into two variables: (1) teacher motivation; and (2) organisational support.

4.4.1 Teacher motivation

The interviews with six teachers identified various reasons for undertaking the programme. It showed that the teachers were very motivated to attend the programme for their professional

development. Four teachers (A, B, C and D) had either searched for the programme on the internet or seen a leaflet in their department. Two teachers (E and F) got the programme information from their heads of school, but they willingly chose the programme.

Teachers' reasons for choosing of the programme seemed to be related to their teaching experiences. Senior teachers who had Rank 4 (A, E and D) and Rank 3 (B) qualification showed confidence in CAR reasoning and theories, so they were more interested in getting information about better CAR practice. However, new teachers (C and F) who had less developed knowledge and experience in CAR wanted to increase their CAR knowledge, as well as to learn more practice. For example, Teacher D specifically wanted to get more data collection skills, while teacher F was not yet confident in conducting CAR and wanted to learn not only the practice but also the theories behind them.

4.4.2 Organisational support

Organisational support consists of school leadership, collaboration, and school culture. Each variable is discussed below.

School leadership

All six teachers interviewed agreed that their heads of schools encouraged the use of CAR. Not all of them explained how they were encouraged to do this in detail, but they felt that there was a supportive culture and that they had the freedom to do what they wanted. In particular, teacher D felt that his head of school might allow him to adopt a quite different way of CAR from a standard one. He also described his head of school as follows: "*He is an open-minded leader, so he is going to allow people to do things that are innovative and progressive. He lets teachers to have a lot of autonomy, so most of the time we just go ahead and do what we want to*". Another example of teacher A admitted: "*Without the head of school, we are not eager to use CAR, since he was the one who supervised the use of CAR in this school*"**.** Her head of school seemed to listen to what teachers were doing and encouraged them by suggesting how to improve it. Likewise, her head of school also added: "*I have to check and give the signature into the CAR proposal before the activities*". Moreover, there was also a head of school as the one initiated the use of CAR in school. Teacher B explained that her head of school was "trying to attempt new ideas herself" and introduced a CAR initiative at the end of each year which allowed teachers to "start CAR planning for the next year". She said that her head of school was "very much at the forefront of picking up new initiatives and new ideas and taking that forward".

Teacher collaboration

The degree of collaboration varied to some extent, which seemed to depend on school culture. Most teachers reported that they had shared and discussed CAR strategies and materials with their colleagues. Sharing happened roughly in two ways. Firstly, teachers shared their ideas and practice when their situation forced them to do so. For example, in Teacher A's school,

collaboration was facilitated among teachers who were planning to conduct CAR. As Teacher A said: "*In every decision making, we plan our research and programme as a team*". Her colleagues met to plan new schemes of research. She also shared teaching experiences and results from CAR during the departmental meetings. She felt that the school encouraged teachers to develop further and her colleagues were supportive of trying new ideas. Another example is monthly sharing activities with other teachers like teacher B's experience, which provided teachers with an opportunity to discuss their CAR projects because teachers had to talk about what they were going to do, and when, in order to check if they had covered everything in the scheme. She thought that the situation gave her "the opportunity to invent things, new ideas". Secondly, teachers shared their CAR activities through informal discussion with other teachers. For example, Teacher A's department seemed to have a strong community, where teachers were open to sharing and learning from each other. In her school, collaboration seemed to happen during the informal meetings. She explained that, "*We discuss ideas and strategies, share some weaknesses, we share everything*". However, the degree of sharing through informal discussion was heavily dependent on the type of person and the school culture. Teacher C discussed teaching methods with her colleagues, but it only happened when she asked them. Teacher F said that she and her colleagues worked together, but actual sharing seemed to be very superficial, such as sharing information of a useful website. They also discussed data among break times, or as teacher D said: "*We share a lot of activities involving data in our school, even in a break time*". However, some teachers reported that it was difficult to find time to collaborate with other teachers. For example, teacher C's colleagues did not seem to collaborate with each other because of lack of time. She explained that "*I think people here work very hard and their time is very limited; getting everyone together to plan stuff, I think, would be quite difficult*".

School culture

Teachers work under various school cultures to encourage CAR. Some schools provide more opportunity for attending PD programme than other schools, so teachers are supported by the school policy. In reality, the policy of each school is quite different, so opportunities to attend an out-of-school PD programme are considerably different amongst the participants. For example, teacher A's school seemed to provide excellent opportunities for teachers' PD. She thought that her school regarded teachers' development as "a vital part" of teaching and learning. The school had various policies that facilitated teachers to continue developing. It also gave teachers more financial support for PD than other schools, causing it to be able to fund PD programmes. Teacher E had greater opportunity than other teachers to attend as many programmes as he wanted. He was allowed to attend about five PD programmes during the previous academic year. On another case, both new teachers, teacher B and C had a relatively more generous PD allowance than the others. Teacher B attended a total of five-week PD programme, and teacher C also said that she had attended many programmes since she had worked at the school. On the other hand, some teachers suffered from lack of school support. Teacher F also found that her school did not allow teachers to attend CAR PD programme due to financial reasons. However, she managed to attend some programmes because she was involved in a project which funded her PD activities.

Another way of encouraging teachers in using CAR is having other teachers to evaluate their own performance by having performance meetings. A performance meeting is a way for teachers to reflect on their teaching with more experienced teachers. Teacher B and E shared that performance meetings encouraged them to conduct CAR because they help them reflect on their teaching. Teacher A explained that it was "to see how you have hit your targets from last year and you have to set yourself targets for the following year". Teacher A thought that CAR helped her to reflect on her teaching and suggested ways to improve herself, while having experienced teachers to support her gave real impact to her development. Besides performance meetings, staff meetings were also considered as one of the most common ways to support CAR. All schools had staff meetings and teachers normally spent their time discussing whole research issues. However, the frequency of having a staff meeting was different in each school. For example, teacher B's school had a staff meeting once a week, while teacher D and E's schools had it once a month.

4.4.3 Summary

This section summarised on how schools act as a promoting or hindering factor in the implementation of the programme. Regarding head of school characteristics, data revealed three characteristics of supportive heads of schools. One had an open-minded attitude towards any new initiatives including CAR project. Another characteristic identified is coaching leadership where heads of schools listen to their teachers' problems in conducting CAR and encourage them. The last characteristic is progressive leadership. A progressive head of school encourages teachers to learn and try new ways of CAR and also provides effective school structure and policy to improve CAR implementation. Regarding collaboration, teacher collaboration and the degree of sharing and discussing happened in two ways, through formal and informal meetings. The formal activities of sharing and discussion were more likely to happen when there was a supportive school policy and culture. Besides that, informal meetings between teachers seemed to facilitate collaboration between teachers the most, but the frequency and quality of the meetings seemed to depend on type of person and school culture. Finally, the research data in this case study show that school policy played a significant role in encouraging teachers in using CAR. Firstly, it provided funds and support for attending PD programme. Secondly, schools provided different types of opportunities to support CAR. They included research groups within their school, collaborative planning time, formal staff meetings, informal meetings, and performance meetings. These activities were also generated as a result of the working culture of the schools.

4.5 CHANGES IN TEACHING PRACTICE

This section analyses and discusses the findings for RQ4: "What changes are there to teachers' teaching practice?". The last process is the final outcomes measured in terms of the expected outcomes of the programme, primarily the impact on teachers (see Figure 8). Based on the conceptual framework, the impacts of the programme on teaching practice were divided into: (1) CAR usage; and (2) levels of use of CAR. CAR usage discusses classroom practice, personal level, and interpersonal level. Levels of use of CAR discusses teachers' level of use

of CAR into their teaching practice as a behavioural indicator. The section is organised in two parts below.

4.5.1 CAR usage

CAR usage establishes discussions on classroom practice, personal level, and interpersonal level. Each explanation is presented below.

Classroom practice

All teachers agreed that CAR was intended to improve classroom practice. For example, teachers said that they acquired pedagogical content knowledge through the use of CAR and changed their lesson plans by adapting the model and their teaching approach. Then, they used a new model in the classroom and found their students were happy and more motivated. Most interviewees agreed that CAR helped them carry out a wider range of practical activities in the classroom. Teacher A and B changed their practice significantly after conducting CAR. For example, Teacher A reported that she tried most of the teaching experiments in her lessons. She shared that she was able to perform the same demonstrations and experiments in different classrooms and the result seemed to reassure her and confirm the best classroom situation for her experiment. The main change is that she demonstrated her teaching method while she was observing and controlling students at the same time. Meanwhile, teacher B conducted better classroom practice in her lessons after conducting CAR as she became more confident in using some new methods. Before, she was 'a bit wary of' using the new teaching method, then she prepared a couple of methods of teaching and planned to apply the method one by one until the solution could be sought and found and such method became her preferable one. Teacher D said that he was also able to vary his teaching method after conducting CAR. He created a journal for each of his lessons and found that it could be reference materials for his upcoming lessons.

Personal level

Data revealed that there was impact of CAR on teachers' personal development. In an interview with teacher D, he mentioned that he made a real effort to become more independent and much more confident, which was contributed by the use of CAR. At first, he had doubts about his teaching practice. He wanted to do a reflection which later resulted him to have a strong will to conduct CAR. Then, he had opportunities to experiment with his teaching method in the classroom as he was teaching the students. Finally, as he had been trying his teaching method to different classrooms and students, he had a proper context and experience to reflect on and became more independent and much more confident as a result. In another case, data showed that teacher A was able to develop various aspects of her professional learning as a result of CAR. Firstly, the programme provided her with a vision to be a better teacher by using CAR, and it interacted with other learning conditions. There were several conditions which facilitated her change. Her personal and professional background provided good conditions for her learning. She had a master's degree and had been teaching for ten years. Her degree gave her

good knowledge of research to help her understand the demonstrations of CAR, so that she could transform them into classroom practice. In addition, as a professional learner, she wanted to increase her confidence in conducting CAR as well as to learn new methods. These needs were addressed in the programme, so she responded to the programme more positively than the others. She thought that the programme provided her with the opportunity to try various CAR methods and showed her how to do them correctly. Although she was already confident in her CAR knowledge behind the experiments, she learnt how to introduce new experiments from other teachers' experiences, as well as from the mentor. As a result, she did develop her own professional learning.

Interpersonal level

In terms of the use of CAR for interpersonal level, three teachers claimed the usage of CAR for teachers to engage with each other in collaborative endeavour. In teacher A's case, teachers collaborated with one another and encouraged each other's CAR project. Teacher A said, "*Because of CAR initiative, we often work together and plan our research as a team*". In addition, CAR created a culture of learning among teachers in her department. Her colleagues frequently talked and shared CAR results through formal and informal meetings. In teacher D's case, he had inspired and encouraged other teachers with his own CAR achievements. He shared and discussed his CAR result with them. Eventually, he became a role model and mentor for other teachers in initiating their CAR project. Beside the engagement among teachers, there was also the usage of CAR to help teachers foster a better relationship with their students. Teacher D who investigated students lacking motivation in his CAR took the next step of his research by approaching students and their parents one by one to discuss their motivation. It helped him understand the way students learn and their difficulties in school. In another case, teacher C found her weaknesses through the process of conducting CAR and thought that this approach could also be adapted for students' better understanding. Teacher C stated that it was her own experience of the difficulty in understanding that helped her understand students' difficulties in learning, as she was in a similar situation while conducting CAR. In her saying, "*I think, to be honest, because of my background and the fact that I have never been confident in doing research, I could understand the difficulties because I have experienced them myself. I think I knew them from my own experiences as being a student struggled with learning*".

4.5.2 Levels of use of CAR

This study examines behavioural indicators of Level of Use (LoU) of CAR implementation of teachers, which vary a range of "No Use" to the highest level of "Use". It included an explicit examination of behavioural indicators of LoU as part of the learning experience, which might help teachers document not only frequency of use, but also, in many instances, the appropriateness of use within specific contexts.

The levels of teachers varied from "Orientation" where teachers had started collecting information about CAR to "Refinement" level where they used CAR for their teaching practice changes. No teacher is at "No Use" level as they had the general understanding about CAR. All teachers had the intention to use the knowledge, skills and resources they received from the

programme in the future. Their answers showed that the most useful thing for their future practice was the facilitation group. Teachers explicitly said that they would use the groups to share and discuss their CAR projects. Teacher C, D and E said they would use the new teaching approaches in the future. Teacher C thought he would use the knowledge and skills in planning lessons. Two teachers (D and E) mentioned that they would incorporate practice and suggestions acquired from their CAR results into their own new curriculum while teacher B expected that he would help other teachers in how to teach practice. Teacher A mentioned a wider range of uses of CAR for her learning. She wanted to continue improving and updating her teaching throughout her career, so she expressed a strong will to change her practice in the following year using what she had learnt from CAR. She also expected to contribute to her colleagues' changes in teaching. She thought that another experienced colleague, would be influenced by her "passion and excitement" and be able to "see things through new eyes".

4.5.3 Summary

As discussed in the literature review, changes in teaching practice are the most important aspect of a teacher's change, and this influences student learning. This section summarised the final outcomes measured in terms of the expected outcomes of the programme, primarily the impact of CAR on teachers into three variables: (1) classroom practice, (2) personal level, and (3) interpersonal level. With regard to teaching changes in classroom practice, all teachers agreed that CAR results were adapted to improve classroom practice. CAR helped them carry out a wider range of practical activities in the classroom. There were two main examples. The first is the use of the same method in different classroom situations until the result seemed to reassure teachers and confirm the best classroom situation for the method. The second is the use of different methods in the same classroom situation until the solution could be sought and found and became the preferable method. In terms of personal level, data revealed that there were impacts of the CAR on their personal level. The first is the use of CAR to improve self-efficacy to become more independent and confident. The second is the ability to develop various aspects of professional learning as a result of CAR. In terms of the use of CAR for interpersonal level, teachers claimed the usage of CAR for teachers to engage with each other in collaborative endeavour and to help teachers foster a better relationship with their students. Finally, this study also examined the level of use of CAR implementation, which varied from "No Use" to the highest level of "Use". One teacher is considered in the Routine level, having established a regular pattern of use but making few, if any, changes. Few teachers mentioned that they would incorporate practice and suggestions acquired from their CAR results into their own new curriculum. Those are in the Refinement level as they made changes to the use as a way of making improvements. A teacher in the Integration level was described as an individual making deliberate efforts to coordinate with others and also engaged in in how to teach practice. Finally, there was a teacher in the Renewal level, that she actively sought more effective alternatives to established patterns of use as she expressed strong will to change her practice in the following year using what she had learnt from CAR.

5 CASE STUDY 2: CLASSROOM ACTION RESEARCH PROGRAMME VERSION II

This chapter presents the second case of this study. Programme Version II was a government-funded training programme held by the Ministry of Education. The programme was held for five days on school days, Monday to Friday, having four days of training for material discussions and practice and the last day for the Teacher Competency Test (*Ujian Kompetensi Guru*) in the CAR-module section. This chapter explores the impact on teacher learning and development. For each RQ, the findings from the survey observation and interview data have been combined and presented under headings reflecting the key components of the conceptual framework (see Figure 16). It is organised in six sections as follows.

Section 5.1 provides information on teachers and the reasons they gave for undertaking the programme.

Sections 5.2 – 5.6 provide the data for RQ1 to RQ4, with each section focusing on a key component in the conceptual framework.

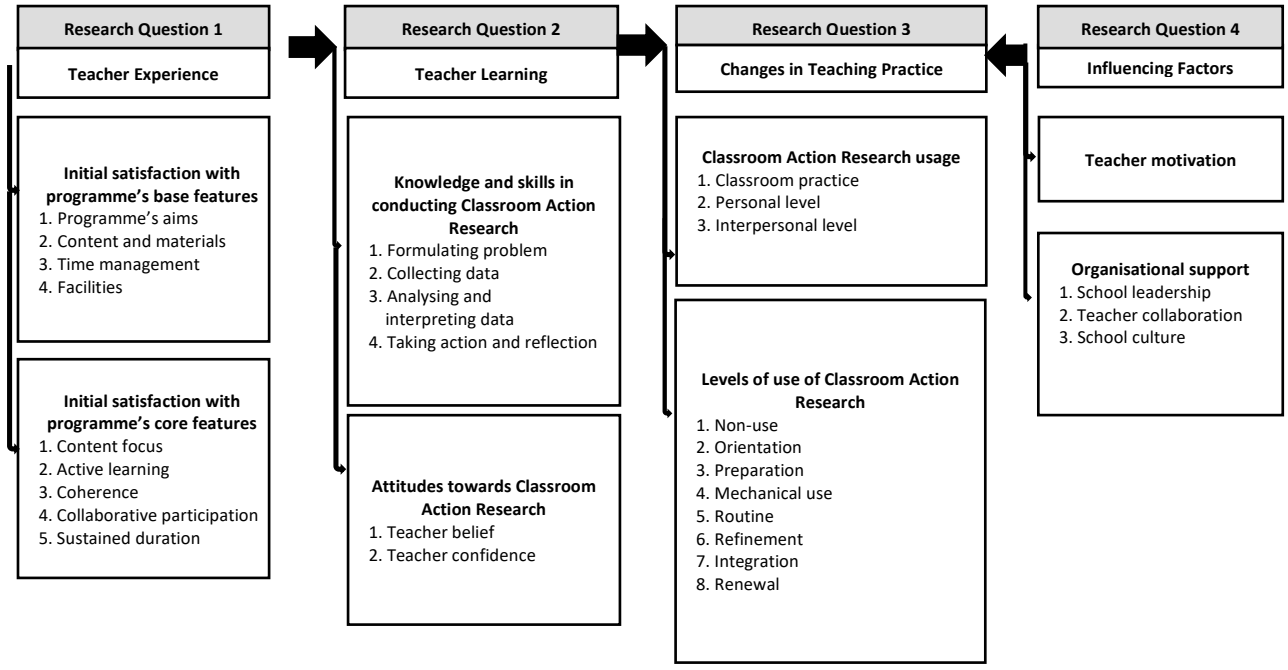


Figure 16. Conceptual framework of my study

As presented in Chapter 4, 20 out of 80 teachers responded to the survey. Of the 20, four were interviewed three months after the programme ended at their own schools. This chapter draws on the following data: 20 questionnaire survey responses; interview with one of four trainers; my observation notes; and interviews with four teachers and their CAR projects.

5.1 TEACHERS' PROFILE

This section presents teachers' personal and professional backgrounds and seeks to find the relationships between their backgrounds, the programme features and their learning. It begins with an overview of their profile and followed by their motives. The profile is tabulated in Table 15. The data shows that their professional backgrounds and experiences are varied.

Table 15. Teachers' profile

Teachers	Degree	Teaching Qualification	Teaching Subject	School Type
Teacher A	Bachelor's degree in Education	Junior teacher (Rank 3)	Literacy	Secondary Public
Teacher B	Master's degree in Education	Senior teacher (Rank 4)	Literacy	Primary Public
Teacher C	Bachelor's degree in Education	Junior teacher (Rank 3)	Literacy	Secondary Public
Teacher D	Bachelor's degree in Education	Junior teacher (Rank 3)	Literacy	Primary Public

All four teachers were graduates. Three of them had a Bachelor degree in Education (A, C, and D) and had a Master in Education. With regard to the second category, three of them are Junior teacher with Rank 3 qualification (A, C, and D) and one Senior teacher (B). They worked at different school types, ranging from primary to secondary. Two teachers (B and D) worked at public primary schools and two (A and C) worked at public secondary schools.

The 20 survey respondents identified similar reasons for undertaking the programme. The survey had four yes/no response options for their motivation in following the programme: personal career development, getting new information and knowledge, head of school's order, and government requirement. Table 16 below summarises the frequencies and percentages of what teachers said their purposes were in following the CAR programme.

Table 16. Teachers' response about their purposes in following the programme (n=20)

Reasons	Frequency (percentages)
Personal career development	10 (50%)
Getting new knowledge	10 (50%)
Head of school's order	0 (0%)
Government requirement	20 (100%)

In general, all teachers joined the programme because of the government requirement. Half did it because they wanted to get new information and knowledge from the programme and wanted to develop their personal career development. The interview of teachers from the programme showed similarities and differences of teachers' needs in following the programme.

The interview data showed that teachers were not very motivated to attend the programme for their PD because the programme was held specifically for teachers to improve their score from

Teacher Competency Test (*Ujian Kompetensi Guru*) in CAR-module section as a standardised platform for teachers' competence. All teachers in Indonesia are obliged to take and pass this test. The head of the programme explained, "*The teachers following this programme were invited because they had not reached the passing grade in CAR-module section*". All teachers' motive for following this programme is merely because they were invited by the government and because they needed to pass the test. They did not follow the training voluntarily. From the interview done with these teachers, most of them admitted that they knew nothing about CAR, thus reflected in their scores. As their saying, "*I know the reason why I was invited: because I got red mark in my score"*. Meanwhile, teacher B was surprised to receive the invitation. She said in disappointed tone, "*I thought I had passed the Teacher Competency Test on CAR module as I knew what CAR was. Yet, I still received the invitation*". Besides the invitation, some teachers mentioned that they followed the programme not only to pass the test, but also to gain more knowledge about CAR and how to conduct it as they already had prior understanding. Interestingly, there was a teacher whose expectation was to know the standard for CAR reports set by the government qualified for a promotion as state teachers. Teacher C mentioned, *"I am very afraid if my research does not meet the government standard, so I expected the trainer would tell us participants the standard for CAR promotion, the procedure and the reports".* Although teachers following the programme had similar needs to improve the low score, it is of interest how teachers had similar needs in different workplace situations and how the programme provider had tried to address these needs to be investigated further.

5.2 TEACHER EXPERIENCE

This section provides information on the findings for RQ1: "What are teachers' experiences of the programme?". This level represents the features or activities of a programme as the inputs or the interventions (see Figure 16). It explores teachers' individual experience and views of the programme. It begins by analysing teachers' views on the base features of the programme: its aims, content, time management and facilities, followed by analysing teachers' view on the core features of the programme: active learning, collaboration, content focus, coherence, and sustained duration.

5.2.1 Programme's base features

This section explores teachers' views of the base features of the programme: its aims, content, time management and facilities. To do this, various sources of data were used, including: the programme details form, observation data, questionnaire data and interview data.

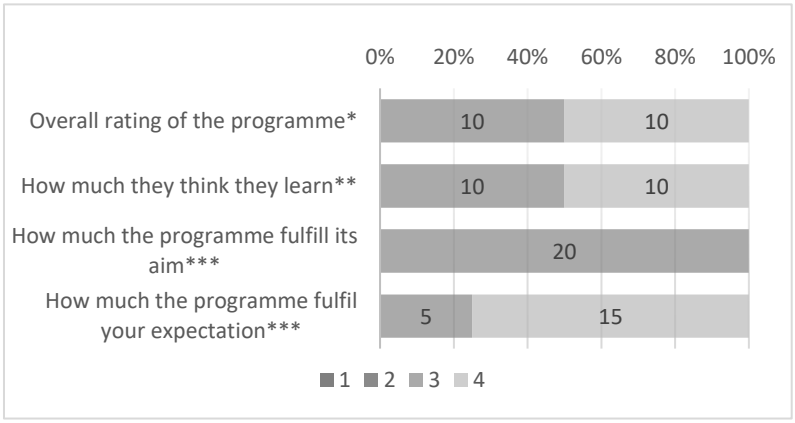
Programme's aims

The interview with the trainer showed that the main purpose of the programme is in CAR-module section as they had not reached the passing grade. This purpose is matched with teachers' motive in following this programme *i.e.* being invited by the government as they needed to pass the test.

Questionnaire surveys revealed that teachers' immediate responses to the programme were positive. It is shown from the survey analysis below that teachers' overall rating of the programme and how much they think they learn have a relatively high mean score of 3.50 and 3.50. Moreover, teachers also thought that the programme met its aims and their expectations fully. It is shown from the survey analysis below that the programme's aims and teachers' expectations were met with relatively high mean scores of 3.00 and 3.75 with a modal score of 4.

Table 17. Mean and standard deviation of the questionnaire on teacher initial response to the programme (n=20)

Teachers' response	Mean (SD)
Overall rating of the programme*	3.50 (.51)
How much they think they learn**	3.50 (.51)
How useful was the programme in fulfilling its aims***	3.00 (.00)
How useful was the programme in fulfilling your expectation***	3.75 (.44)



* four-point scale, rating from 1= 'not satisfied' to 4= 'very satisfied'
** four-point scale, rating from 1= 'nothing' to 4= 'very much'
*** four-point scale, rating from 1= 'nothing' to 4= 'fully'

Figure 17. Teachers' initial response to the programme (n=20)

Based on the interview data, all teachers had vary responses to the programme. Two of them said that they were happy to take the programme. Teacher A particularly appreciated the trainer as very motivating, inspiring and full of exciting experiences. She expressed her satisfaction as "amazing trainer, he was very kind and facilitating in the programme". She added that she was satisfied with the programme and felt more capable in doing post test after the programme. Teacher D similarly reported that she enjoyed the programme and the aims of the programme were consistent with her reason in following the programme *i.e.* to improve her score. All teachers' expectation was to improve their scores. Such expectation was fulfilled although some teachers felt that there was still something missing from the programme. Teacher B wanted to practice CAR and got facilitated instead of being taught the theories to improve the score. The programme was less concerned with the implementation of CAR. Moreover, teacher C expected to know the standard from the programme for CAR reports set by the government qualified for

a promotion as state teachers. Therefore, the programme was not suitable for some teachers who had different expectation of learning to practice CAR. In addition, most teachers were not familiar with CAR. As a result, although they had improved their score and gained some theories about CAR, their CAR implementation was yet successful due to their lack of practice.

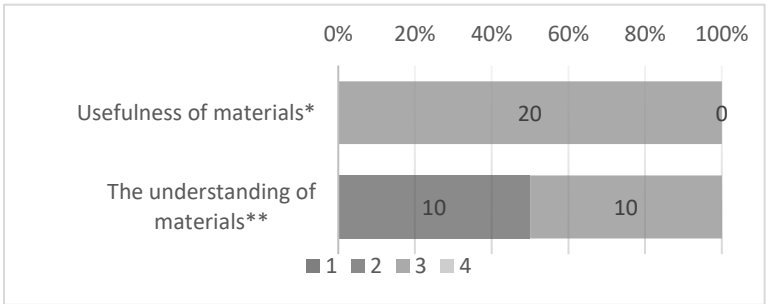
Contents and materials

The programme discussed four main topics: (1) The principle of CAR, (2) Conducting CAR, (3) Reflecting the result of CAR, and (4) Proposal-making. The trainer saw the materials only as a way for teachers to be able to pass the passing grade of Teacher Competency Test (*Ujian Kompetensi Guru*). Consequently, he put a lot of CAR theories and concepts and made them into test trials and worksheets. The way the materials were presented to the teachers was not only through lecturing, but also question-and-answer discussion. From the observation of the programme, to achieve the first objective of understanding the principle of CAR, the trainer used a lecture-style approach. Regarding the second and third objectives, he seemed to expect that teachers could meet the objectives by listening and asking questions during the discussion. The fourth objective seemed to be an unimportant subject for the provider as he did not emphasise it during the programme. Therefore, the objective had minor impact on teachers' learning. By the end of each day, there was always a test of the materials at that day.

The questionnaire surveys show that teachers thought that the content materials were useful and easy to understand. The mean score of the usefulness of materials is 3.00 with the modal score of 3. This means teachers mostly agreed with the statement that the content materials were useful. The mean score of the understanding of materials is a relatively low score of 2.50 with the modal score of 2, which means teachers found that the materials were not easy to understand. The mean and standard deviation of the content materials are presented in Table 18.

Table 18. Mean and standard deviation of the questionnaire on teachers' response to programme materials (n=20)

Programme Materials	Mean (SD)
Usefulness of materials*	3.00 (.00)
The understanding of materials**	2.50 (.51)



* four-point scale, rating from 1= 'not useful' to 4= 'totally useful'
** four-point scale, rating from 1= 'hard to understand' to 4= 'easy to understand'

Figure 18. Teachers' response to the materials of the progamme (n=20).

Based on the interview data, teachers' immediate responses were not positive. From teachers' perspective, they saw the materials focused on too many theories and concepts instead of the implementation. teacher C said, "*There was too many theories instead of practical implementation*". Teacher B added, "*I feel that the materials only focused on the upcoming test instead of encouraging me to conduct CAR into my teaching practice*". Most teachers' response to the approach was that this was not necessary as they already knew the theories even though they had low score. Teachers pointed out that the wanted more time to conduct the CAR themselves. Regarding how the materials were presented, teacher A said, "*Too many materials for five-day programme*". Teacher D added, "*The materials were too hard to understand because I have to learn them all by myself instead of having the trainer explain them to me*". On the other hand, teacher A shared that the trainer explained the materials well because his role was as a facilitator, where teachers were obliged to read and learn the materials by themselves and the trainer helps later in fixing any misunderstanding.

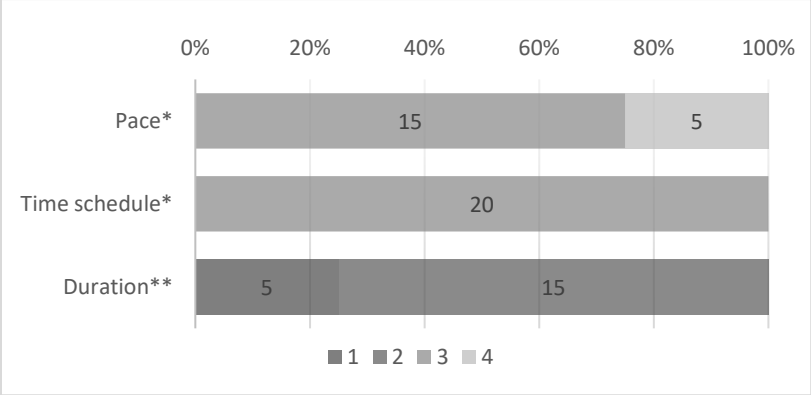
Time management

Programme Version II was a five-day programme on school days, from Monday to Friday. It was divided into four days of lecture and one day of the test itself. Each session was done in one day from 8 AM to 5 PM, having a break for an hour from 12 PM to 1 PM. By the end of each session, teachers were given a test and homework that they had to submit the next day. On the last day, there was no lecture at all, only the test which took two hours in the morning. After the test, teachers went back to their schools. The head of the programme explained the reasons why the programme took five days in a row on weekdays. The first one was because he wanted teachers to maintain their focus in learning the materials and passing the test. The second one is because of the number of participants. The programme was held for all teachers in Jakarta failing to reach the passing grade. The programme was made batch by batch having each batch for one week. Each week had different teachers as the participants.

From the survey, the mean and standard deviation of the time management are presented in Table 19 below. The pace of the programme received a relatively high mean score of 3.25 with the modal score of 3. This means teachers were satisfied with the pace of the programme. For the time schedule, the mean score is also relatively high of 3.00 with the modal score of 3, as teachers were content with the scheduled time the programme offered. However, the mean score of duration is relatively low of 1.75. This is because teachers thought that the programme was noticeably short in duration. Moreover, the interviews with teachers showed a deeper understanding of how teachers perceived time management from the programme.

Table 19. Mean and standard deviation of the questionnaire on teachers' response to the time management of the programme (n=20)

Time management	Mean (SD)
Pace*	3.25 (.44)
Time schedule*	3.00 (.00)
Duration**	1.75 (.44)



* four-point scale, rating from 1= 'very bad' to 4= 'very good.'
** four-point scale, rating from 1= 'too short' to 4= 'very good

Figure 19. Teachers' response to the time management of the programme (n=20)

The interview data revealed teachers' varied responses. Teacher A said the content of the materials was distributed well throughout the four days. Accordingly, teacher D said the schedule was exceptionally good, on time and well structured. However, teacher C said the programme was not scheduled very well and not focused. As she said, "*Beside me spending the entire day at the programme, I still also had to spend more time at home to do the homework*. Teacher B complained, "*Since the programme was held on weekdays, I had to find a replacement teacher for the week. Besides, leaving the classroom for a week quite interfered with my lesson plan*". She suggested to have the programme once a week rather than having it for five consecutive days.

Facilities

Teachers were satisfied with the room management, location, building facilities and meals of programme. This was shown from the relatively high mean score of each variable: room management with 3.75, location with 3.50, building facilities with 3.50 and meals with 3.75 and all with the modal score of 4. Moreover, the interview of teachers showed a deeper understanding of how teachers perceived the facilities from the programme. Table 20 below presents the mean and standard deviation of view about the facilities.

Table 20. Mean and standard deviation of the questionnaire on teachers' response to the programme facilities (n=20)

Facilities	Mean (SD)
Location*	3.75 (.44)
Room management*	3.50 (.51)
Building facilities*	3.50 (.51)
Meals*	3.75 (.44)

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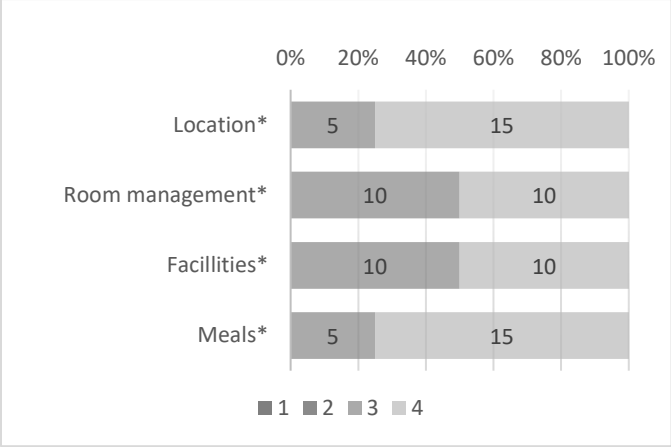


* four-point scale, rating from 1= 'very bad' to 4= 'very good

Figure 20. Teachers' response to the programme facilities (n=20)

Programme Version II was held in a government facility. It was an old building located in the middle of an industrial area, far from teachers' houses and schools. Since it was in the middle of an industrial area, it was not easy to locate and access as there was no public transportation going to/from there. One teacher said, "*The location was too far from my house that I am sometimes late in arriving*". Another said, "*The location was not conducive for learning as it was an old building*". Another who did not have private transportation complained, "*Because there was no public transportation going to/from the location, it was hard to access*". Meanwhile about the facilities, the room used for the programme was a classroom with the capacity of 20 people sufficient for the 20 participants having the seats arranged into letter-U making interaction easier between the trainer and teachers. Everyone in the programme were given a meal, hot beverages (tea and coffee) and snacks. Overall, both trainers and teachers were satisfied with the facilities of the programme.

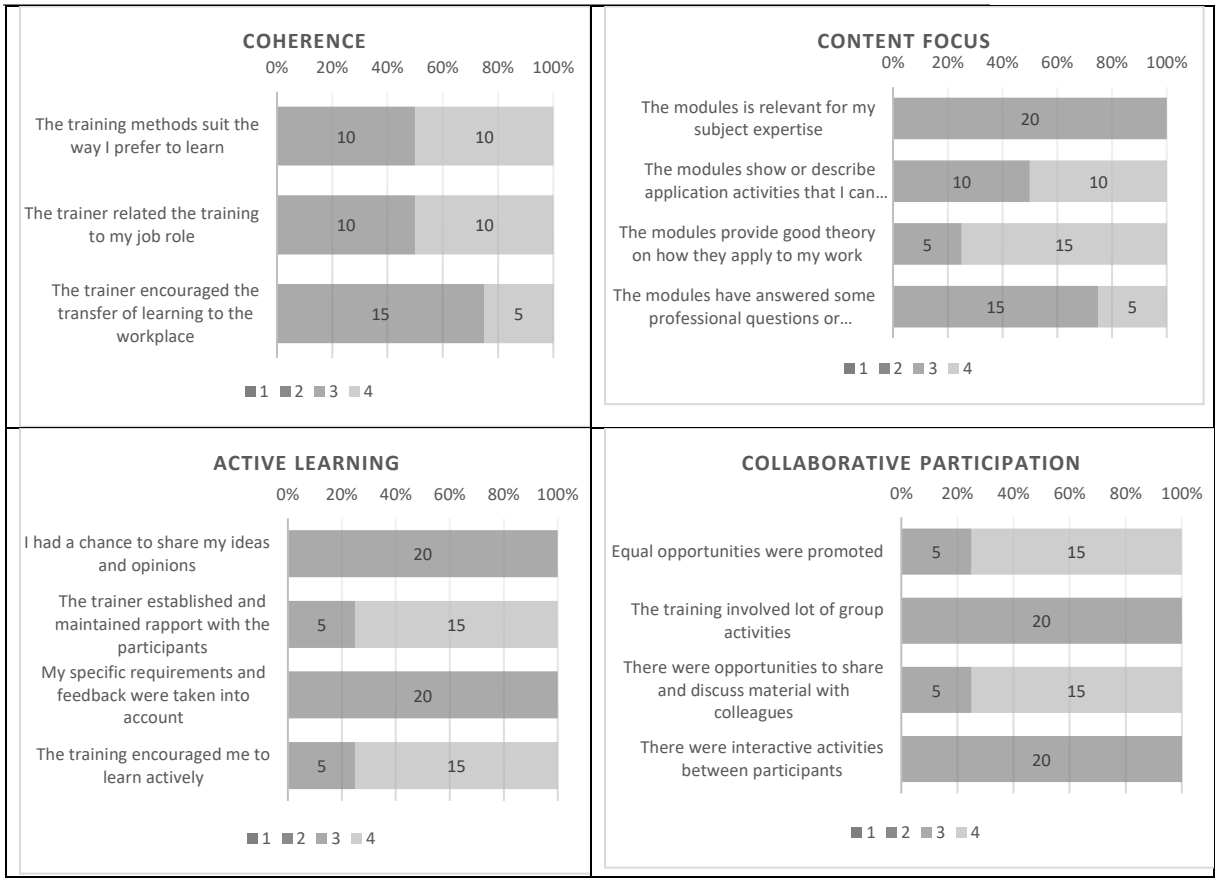
5.2.2 Programme's core features

Based on the survey, teachers' view on active learning received a mean score of 3.94. This is a relatively high score which means teachers generally agreed that active learning occurred during the programme. For example, most of the teachers agreed with statements such as: "*I had a chance to share my ideas and opinions*" and "*The programme encouraged me to learn actively*". Concerning collaboration, most of the respondents agreed with statements such as: "*The programme involved a lot of group activities*" and "*There were interactive activities between participants*". It is noteworthy that collaboration received a relatively high mean score of 3.88. Regarding coherence, most teachers agreed that the programme's methods suited the way they preferred to learn and with their role in their workplace. It is shown in the mean score of coherence which reached a relatively high mean score of 3.42. Finally, the content focus received a mean score of 3.63. This is also a relatively high score, meaning that teachers generally agreed that the programme was content-focused. For example, most of teachers agreed with statements such as: "*The programme shows or describes application activities that I can readily implement in my classroom*" and "*The programme is relevant for my subject*

matter". The mean and standard deviation of the programme features are presented in Table 21 below.

Table 21. Mean and standard deviation of the questionnaire on teachers' response about the core features of the programme (n=20)

Programme features	Mean (SD)
Active learning*	3.94 (.11)
Collaborative participation*	3.88 (.22)
Content focus*	3.63 (.22)
Coherence*	3.42 (.47)



* four-point scale, rating from 1= 'totally disagree' to 4= 'totally agree'

Figure 21. Teachers' response to the statements about core features of the programme (n=20)

The next section reports the analyses from the interview of teachers based on the five variables of the programme features from the conceptual framework.

Content focus

The programme was content-focused. It was reflected from teachers' area of expertise *i.e.* Indonesian literature. A teacher shared, "*Some of the materials were useful in formulating my*

problems in teaching Indonesian literature". The head of the programme confirmed by saying, "*This training was divided according to the subject knowledge of teachers, so that it synced with their subject knowledge."*

Active learning

Programme Version II had active participation in every session. Such active participation was seen when teachers were divided into groups and asked to discuss a task from the daily worksheet with each other. For example, there was a task for them to create a mind-mapping poster of the importance of CAR and, on the fourth day, they were asked to present the problems that they formulated to become their research. The trainer explained, "*These kind of active learning tasks were intended to engage teachers to the materials to help them understand better*". This concept of active learning task was a standardised method by the government for this programme because the trainer acted more as a facilitator rather than just a speaker. Teachers also agreed that there were many active participations during the programme. One teacher said, "*Beside listening and understanding directly from the trainer, I had to understand these materials alone by reading the module and doing the tasks given*". However, there were cases where some teachers were less active as they depended on others to complete the tasks. A teacher said, "*As an example, some tasks were done only by teachers having/bringing their laptop to the programme*".

Collaborative participation

The programme had collaborative activities among teachers as they were divided into groups to discuss the daily task. The head of the programme explained, "*The group activities were intended to make teachers help each other in learning the materials*". Not only did collaboration happen in the group, but teachers also collaborated with another from other groups by presenting their discussion result. Another said, "*We had to present the topic we discussed before to the rest of the groups which led to a further discussion between groups for that particular topic*".

Coherence

The programme was partly coherent with teachers' expectations and prior understanding. It was coherent because part of the teachers had an expectation of following the programme merely to improve their score. One said, "*I have a couple of red marks of my competencies and the programme helped me to improve the score*". Meanwhile, another part of the teachers had more expectations than just passing the test as they already had prior understanding about CAR. One teacher said in the interview, "*The training was more about theories than the implementation of CAR. I was actually surprised to know that I still got the invitation as I feel that I had already had the understanding and knowledge about CAR before*". However, from the head of programme's perspective, he shared, "*Teachers invited to this training were those failing the test, meaning that they still had minimum knowledge about CAR itself*."

Sustained duration

The programme was held annually having each batch lasting for a week (five days). As the objective of the programme was for teachers passing the test, the only follow-up was done to those who still failed the test. Those who passed the test would not get the follow-up programme from the government. The head of programme explained, "*With the limited budget and time, we (the government) focus more to teachers failing the test than those passing so that teachers in Jakarta can reach the standard. After the target is reached, we will design the further plan*". On the other side, a teacher said, "*I passed the test, but there was not any follow-up to help me start my CAR project*". Another shared, "*I felt there was not enough time during the training for them to begin CAR project. I hoped there was a follow-up to make at least a CAR proposal*."

5.2.3 Summary

This section summarised the overall teachers' experience and views of the programme. Regarding the aims of the programme which is for teachers in Jakarta region invited to improve their score from Teacher Competency Test (*Ujian Kompetensi Guru*) in CAR-module section as a standarised platform for teachers' competence, the aim of the trainer matched with teachers' reason in undertaking this programme *i.e.* being invited by the government as they needed to pass the test. All teachers had varied responses to the programme immediately after the programme ended although the shared the same expectation that was to improve their scores. Such expectation was fulfilled but there were some teachers expecting a session of CAR implementation causing the programme not suitable for them. From teachers' perspective, they saw the materials focused on too many theories and concepts instead of the implementation. Finally, teachers were satisfied with the time management, location, and building facilities of the programme, although some suggested to have the programme once a week rather than five consecutive days.

Data showed that the strategies and engagement of the programme are consistent with three of the five core features of PD programme to promote conditions for teacher learning. Firstly, the programme had active participation in every session. Such active participation was seen when teachers were divided into groups and asked to discuss a task from the daily worksheet with each other. Secondly, the programme had collaborative activities among teachers as they were divided into groups to discuss the daily tasks. Thirdly, it was a content-focused programme, which was reflected from the content of the materials and teachers' area of expertise *i.e.* Indonesian literature. Regarding coherence, the programme was mostly coherent with teachers' expectations and prior understanding. It was coherent because all teachers had expectation in following the programme to improve their score, although some had more expectation of having a session of CAR implementation than just passing the test as they already had prior understanding about CAR and expectation of knowing the standard for CAR reports set by the government qualified for teacher promotion. Finally, the programme has no sustained duration, as it was a programme held annually having a batch for a week. As the objective of the programme was for teachers passing the test, the only follow-up was done to those who still failed the test.

5.3 TEACHER LEARNING

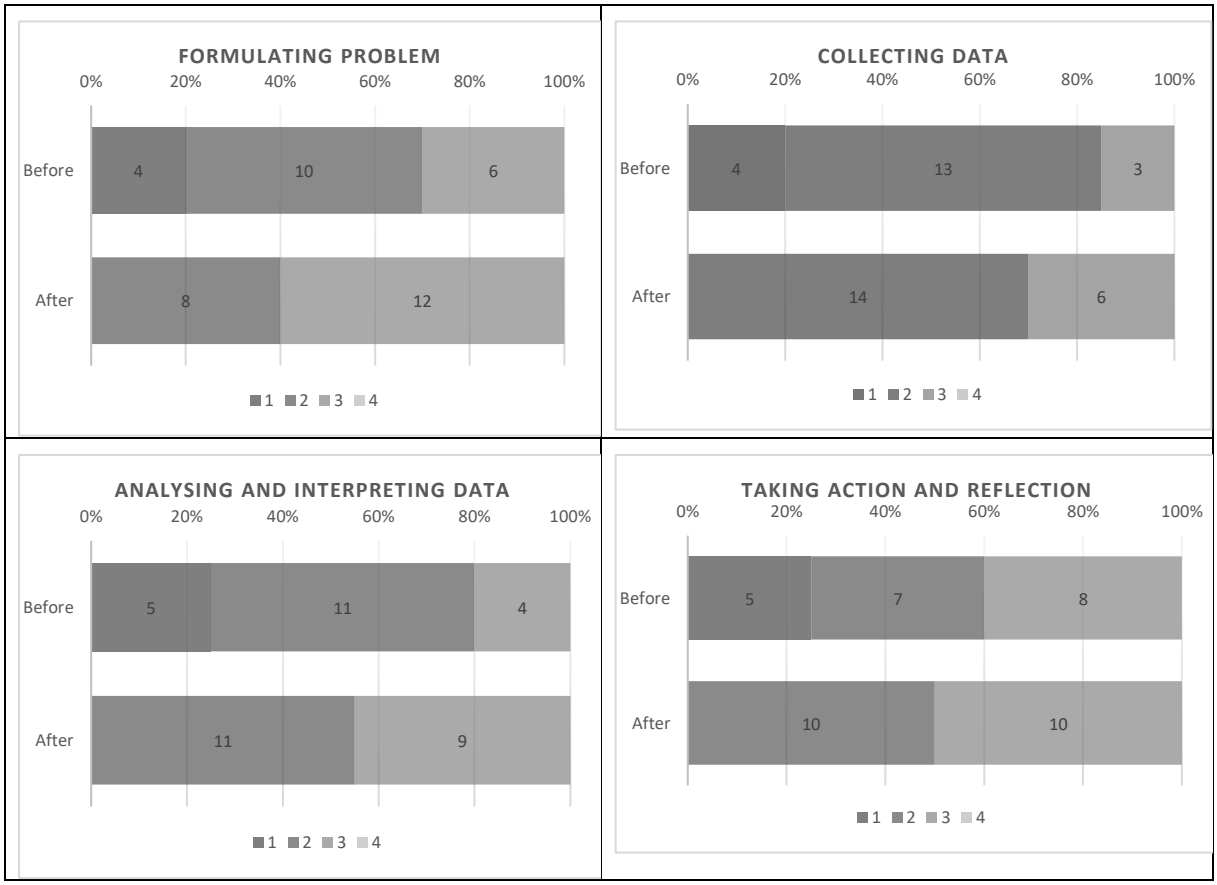
This section provides information on the findings for RQ2, "What do teachers learn from the programme?". This level is considered as the pre-condition that enables the attainment of the final outcomes which are the changes in teaching practice (see Figure 16). It identifies the increase in teachers' knowledge and skills and the changed attitudes towards CAR, that might enable them to change their practice.

5.3.1 Knowledge and skills in conducting CAR

Based on the survey regarding how to formulate a problem, teachers' responses in their changes received a relatively low mean score of 2.60 with the modal score of 2. Concerning how to collect data, it received a relatively low mean score of respectively 2.40 with a modal score of 2. About data analysis, it received a relatively low mean score of respectively 2.20 with a modal score of 2. Concerning action-taking and reflection, it received a relatively low mean score of respectively 2.58 with a modal score 2. This all means most teachers from the programme claimed that they did not know how to formulate a problem, collect and analyse data, take action and reflect after the programme. Finally, although the mean score of all knowledge and skills after the programme is relatively higher than before the programme, there is no significant difference between them. The mean and standard deviation on teachers' response to their knowledge and skills before and after of each programme are presented in Table 22 below.

Table 22. Mean and standard deviation of questionnaire on teachers' rating of their own knowledge and skills before and after the programme (n=20)

Knowledge and skills	Mean (SD)	
	Before	After
Formulating problem	2.10 (.74)	2.60 (.64)
Collecting data	1.95 (.44)	2.45 (.47)
Analysing and interpreting data	1.95 (.48)	2.45 (.51)
Taking action and reflection	2.15 (.69)	2.50 (.50)



* four-point scale, rating from 1= 'No knowledge and skills' to 4= 'very good'

Figure 22. Teachers' response to their own knowledge and skills before and after the programme (n=20).

The next section reports the analyses from the interviews with teachers based on the four variables of knowledge and skills from the conceptual framework.

Formulating problem

In Programme Version II, all teachers argued that there was no impact on their learning of problem formulation. What they got from the programme was only general explanations or theories on problem formulation. However, there were some teachers getting the concept of problem formulation starting to implement it. Teacher B found that students were not really interested in Indonesian literacy, she got idea about filmmaking in improving students' interest towards Indonesian literacy. Teacher C had ideas to research student motivation in the class, but she could not elaborate in detail yet. All teachers agreed that they still needed more practice in training to formulate a problem, as they still grasped the ideas. Teacher D suggested having a task for each topic, such as in formulating problems, teachers were asked to formulate a problem back at school which would be evaluated on the next day.

Collecting, analysing and interpreting data

Teachers claimed that they did not learn about data collection, analysis, and interpretation in the programme. They claimed that they were introduced to only the general concept, but they had not done anything about it. Most of the knowledge were reading materials. Teachers who wanted to conduct CAR also suffered from lack of time to read them. Teacher C had to spend her school holiday to read them. Teacher B intended to observe her students in their daily activities, but she could not elaborate what kind of instrument she wanted to observe them with. Teacher A claimed she got enough information from the programme on how to collect and analyse data, but she admitted she had not used it yet. Teacher C admitted even she had not gotten the concept really well let alone implemented it. She said, especially in collecting data, she felt that she needed much more attention and focus as well as more techniques and practice instead of the theories. Teacher D suggested to have step by step training per skill, from data collection until data interpretation.

Taking action and reflection

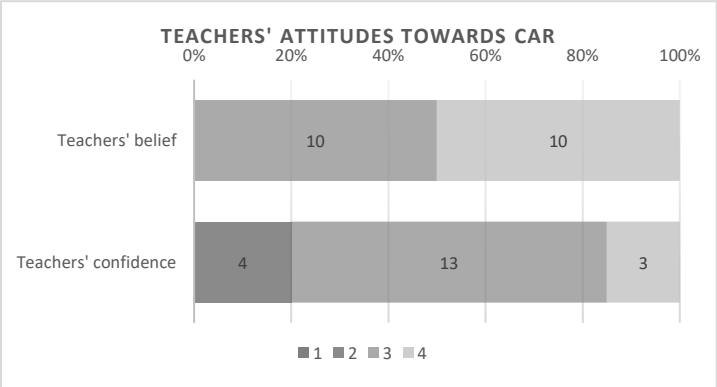
In this section, teachers were introduced the general knowledge of the last step in CAR cycle: action-taking and reflection. However, teachers claimed that they had not really grasped the idea of CAR in the programme as they were taught CAR theories merely to the test. However, there were some teachers who had gotten the concept of taking action based on a problem and started to do the implementation. Teacher B got a plan to use information technology to support her drama lesson in her class as she planned to make a film based on her students' drama show to make them more interested in the lesson. Teacher C wanted to test his method in two different classrooms with different situations having one is highly active and another is less active. All teachers usually claimed that they made a reflection about their teaching practice every day, but they admitted they have not documented in writing or collected data in systematic manner. Teacher A suggested to have mentor provided by the government to guide teachers in every cycle of CAR.

5.3.2 Attitudes towards CAR

Based on the survey concerning attitudes towards CAR, teachers' belief on the programme received a relatively high score of 3.50 with a modal score of 4. This means teachers generally agreed that they believe in the importance of CAR. Meanwhile, teachers' confidence also received a relatively high mean score, even though not as high as teachers' belief, 2.95 with the modal score of 3. This also means that teachers generally agreed on their confidence in conducting CAR. However, regarding the difference between teachers' attitudes towards CAR before and after the programme, it received a relatively low mean score of respectively 2.35 with the modal score of 2. This is because less than half of teachers agreed that the programme had an impact on their attitudes towards CAR. The mean and standard deviation of teachers' response on how far attitudes towards CAR improved are presented in Table 23 below.

Table 23. Mean and standard deviation of the questionnaire on teachers' response about to their attitudes towards classroom action research (n=20).

Attitudes towards CAR	Mean (SD)
Teachers' belief	3.50 (.48)
Teachers' confidence	2.95 (.57)
Impact on attitudes towards CAR	2.35 (.47)



* four-point scale, rating from 1= 'not important to 4= 'very important'
** four-point scale, rating from 1= 'not confident to 4= 'very confident'

Figure 23. Teachers' response to their attitudes towards CAR (n=20)

From the interview, all teachers believed that CAR was important before and after the programme. According to them, CAR was important because it was a requirement for teacher promotion, although some added that it could also help solve their teaching problems. Regarding confidence, they claimed that there was no impact on their confidence after following the programme. Teacher C shared, "*I am not so sure about myself being able in conducting CAR*". Teacher A admitted as well that she was not confident enough to conduct CAR. She said her motivation usually remarkably high right after the programme ended, but then disappeared over time as her teaching activities progressed at school. Similarly, teacher D said the programme motivated her for a while but then her confidence was gone after couple of months. Meanwhile teacher B said, "*I am still reluctant in conducting CAR as I still have not had such belief in myself."* The programme did not push her confidence as she felt that because conducting CAR is a requirement, she was forced to do it. She said she needed more examples, but the programme did not focus on CAR implementation. In addition, she hoped the government would facilitate teachers in conducting CAR as well as the follow up.

5.3.3 Summary

This section summarised the overall teachers' changes in knowledge, skills and attitudes towards CAR. Teachers' changes in knowledge and skills of CAR involved four aspects of changes: formulating problem; collecting data; analysing and interpreting data; and reflecting and taking action. Data showed that all teachers argued that there was no impact on their

learning of all four aspects. They claimed that they were introduced with only the general concept, having most knowledge was reading materials. Teachers who wanted to conduct CAR suffered from the lack of time to read the materials and suggested having a task for every aspect. On the other hand, regarding teachers' belief towards CAR, most teachers already had their belief towards CAR and, thus, the impact of the programme on their belief was not significant. Most of them added that CAR was important because it was a requirement for their promotion. Teachers also claimed that there was no impact on their confidence after following the programme as they saw CAR more as a requirement that they were forced to do it.

5.4 INFLUENCING FACTORS

This section analyses and discusses the findings for RQ3: "What are the organisational factors in schools that promote or hinder teachers in using CAR to improve their teaching practice?". This outlines how schools act as a promoting or hindering factor in the implementation of the programme. These factors are variables in the external environment of the programme (school and wider environment) that regulate how interventions are implemented and explain why similar intervention activities have diverse outcomes across different individuals (see Figure 16). Based on the conceptual framework, the impacts of the influencing factors in schools that promote or hinder teachers in using CAR were divided into two variables: (1) teacher motivation; and (2) organisational support.

5.4.1 Teacher motivation

The interview data showed that teachers were not very motivated to attend the programme for their PD because the programme was held specifically for teachers to improve their score from Teacher Competency Test (*Ujian Kompetensi Guru*) in CAR-module section as a standardised platform for teachers' competence. All teachers in Indonesia are obliged to take and pass this test. The head of the programme explained, "*The teachers following this programme were invited because they had not reached the passing grade in CAR-module section*". All teachers' motive for following this programme is merely because they were invited by the government and because they needed to pass the test. They did not follow the training voluntarily. From the interview done with these teachers, most of them admitted that they knew nothing about CAR, thus reflected in their scores. As their saying, "*I know the reason why I was invited: because I got red mark in my score"*. Meanwhile, teacher B was surprised to receive the invitation. She said in disappointed tone, "*I thought I had passed the Teacher Competency Test on CAR module as I knew what CAR was. Yet, I still received the invitation*". Besides the invitation, some teachers mentioned that they followed the programme not only to pass the test, but also to gain more knowledge about CAR and how to conduct it as they already had prior understanding. Interestingly, there was a teacher whose expectation was to know the standard for CAR reports set by the government qualified for a promotion as state teachers. Teacher C mentioned, *"I am very afraid if my research does not meet the government standard, so I expected the trainer would tell us participants the standard for CAR promotion, the procedure and the reports".* Although teachers following the programme had similar needs to improve the low score, it is of interest how teachers had similar needs in different workplace situations and how the programme provider had tried to address these needs to be investigated further.

5.4.2 Organisational Support

Organisational support discusses school leadership, collaboration, and school culture. Each variable is explained below.

School leadership

It seemed that school leadership was problematic for all schools whose teachers followed Programme Version II. What is intriguing is that even though all heads of schools claimed that they supported their teachers engaging in CAR and providing time for teachers to practice CAR, none of the teachers confirmed that those statements were true. For example, teacher A argued about lack of leadership which she stated: "*The head of school is not close to us, he likes to demand teachers only to follow programmes and complete the requirements".* Teacher B said that usually the head of school supported them in morale but not with materials or funding or real policies. Teacher C said there was no direct support from the head of school. On another case, teacher D said that she wanted to consult with her head of school about CAR, but the problem was, her head of school did not have any experience in CAR. These testimonials implied that teachers were lacking supportive conditions. Therefore, teachers who wanted to conduct CAR were likely to be suffering not only from limited subject knowledge and skills, but also from insufficient support of their head of schools.

Teacher collaboration

Most teachers were not encouraged to share their experiences with other teachers in their schools. Teacher A confirmed that there was no collaboration, "*There was no meeting or discussion in planning research programme*". Only Teacher B shared that the teachers in her school had collaborated in planning CAR. She expressed that "*I don't think there is anything that we don't collaborate on*". In other case, Teacher C seemed to have the basic idea of disseminating teachers' result of CAR. However, it was not teachers' priority during busy school time, and the school did not monitor whether teachers disseminated their experience of CAR. Other teachers in the school seemed to be reluctant to learn from others' experiences. School culture affected the degree of collaboration, sharing and discussing teaching, and the success of other school lead policies. However, most schools in these cases seemed not to have a supportive collaborative culture as such culture was rarely found through activities. Instead, there was only sharing and discussing, which did not need a huge amount of time, and teachers mostly worked individually.

School culture

When teachers were asked in their interviews about their opportunities for PD in their schools, the most dominant answer was attending out-of-school PD programmes instead of provided by their schools. Most teachers thought that their school allowed teachers to go on PD programmes, and some heads of schools encouraged teachers to attend PD programmes. All teachers did not have a problem with attending the programme. The general procedure for teachers having the permission to follow PD programmes was only discussing them with their heads of schools or

having their heads of schools asked teachers to follow a programme. For example, teacher B explained that her head of school is very supportive to teachers following CAR programmes as long as they explained the reasons. Teacher C also expressed his feeling of school support for teachers' PD as "*The head of school never said "No, you cannot follow that programme"*". This shows the potential power of school policy to promote teacher development. However, the majority of interviewees did not mention programmes provided by their schools as an opportunity for PD when they were asked in the interviews. This was a less dominant answer than the out-of-school PD programmes.

There were alternative types of school policy support on CAR in the schools besides PD. For example, school policy provided an opportunity for sharing teaching. Teacher B's school had a policy to share experience and result of CAR during departmental meetings or collaborative planning time. The policies set up this idea that they needed to learn from others, However, all other teachers claimed there had not been a supportive school culture established. Other teachers seemed to regard teaching as a personal matter rather than as a collective effort.

5.4.3 Summary

This section summarised on how schools act as a promoting or hindering factor in the implementation of the programme. Regarding head of school characteristics, it seemed that school leadership was problematic for all schools whose teachers followed the programme. There was no direct support from their heads of schools as usually they support their teachers in morale but not with materials or funding or real policies. Regarding collaboration, teachers had varied responses. However, most schools seemed not to have a supportive collaborative culture. Except Teacher B's school, a collaborative working culture through activities was not found. There was only sharing and discussing, which did not need a huge amount of time, and teachers were mostly working individually. Finally, the research data in this case study showed that school policy played an important role in encouraging teachers in using CAR. The most dominant answer was attending out-of-school PD programmes instead of provided by their schools. Most teachers thought that their heads of schools allowed them to go on PD programmes, and some heads of schools encouraged their teachers to attend PD programmes. There were also alternative types of school policy support on CAR in the schools besides PD. For example, school policy provided an opportunity for sharing teaching. However, most teachers claimed there had not been a supportive school culture established. other teachers seemed to regard teaching as a personal matter rather than as a collective effort.

5.5 CHANGES IN TEACHING PRACTICE

This section analyses and discusses the findings for RQ4: "What changes are there to teachers' teaching practice?". The last process is the final outcomes measured in terms of the expected outcomes of the programme, primarily the impact on teachers (see Figure 16). Based on the conceptual framework, the impacts of the programme on teaching practice were divided into: (1) CAR usage; and (2) levels of use of CAR. CAR usage discusses classroom practice, personal level, and interpersonal level. Levels of use of CAR discusses teachers' level of use

of CAR into their teaching practice as a behavioural indicator. The section is organised in two parts below.

5.5.1 CAR usage

CAR usage establishes discussions on classroom practice, personal level, and interpersonal level. Each explanation is presented below.

Classroom practice

With regard to teaching changes in classroom practice, it seemed that the use of CAR for classroom practice was still an unimplemented plan for all teachers in Programme Version II. Teacher C admitted there is no impact from the training in her classroom practice so far. Teacher D said she had the willingness but yet implemented. Teacher A was interested but she was still in problem formulation phase. Teacher B got a plan to use information technology to support her drama lesson in her class as she planned to make a film based on her students' drama show to make them more interested in the lesson. However, she admitted that she had not implemented the plan yet. Nevertheless, teachers were still in the problem formulation phase and had not finalised the research question to their CAR projects. They thought that their needs were not met in the programme or the contents did not help to their use of CAR for classroom practice.

Personal level

The programme contributed to teachers' personal development is questionable, as there was only a small number of fragmented changes in knowledge and practice based on previous section. All teachers claimed that improving their scores from Teacher Competency Test (*Ujian Kompetensi Guru*) was what they understood as their own personal development. Teacher A said that if teachers did not have any intention to use CAR, they used it merely for promotion purposes. Besides that, there were teachers using CAR as a tool to gain achievements in competitions rather than merely personal learning. Teacher B said that one benefit of being able to conduct CAR is that she could join CAR reports competitions and get achievements for them. Teacher D mentioned that CAR is teachers' original innovation, their one thing to be proud of and make them better. Regarding the lack of own professional learning based on CAR, most teachers blamed this to the lack of facilitation from the programme, lack of time or support to do it, instead of blaming themselves or their lack of willingness to conduct CAR and learn.

Interpersonal level

Data of this case revealed that it was hard to find participants who had use CAR to encourage collaboration with other teachers or students. The level of sharing and discussing with other teachers was also superficial. There was a teacher who said that she wanted to initiate the collaboration to conduct CAR together with other teachers in her school using social media, but she admitted that she forgot to follow it up. Teacher D said she tried to inspire her method to other teachers, but they were still not interested in conducting CAR. Teacher C, in other case,

said that teachers in his school usually kept the result for themselves so it was shared well. Teacher B claimed CAR was supposed to help teacher communicate better with students, one idea she had is to find a literacy teaching method fun for students and make more interactions with students with more questions from them, however, is not yet implemented.

5.5.2 Levels of use of CAR

This study examines behavioural indicators of LoU of CAR implementation of teachers, which vary a range of "No Use" to the highest level of "Use". All teachers had not shown signs of using CAR in the previous discussion, which implied that they were all still in "No Use" level to "Orientation" range that they had started finding information about CAR. Teacher A was considered in Non-Use level or the lowest level in "No Use" range as such level described individuals taking no action whatsoever with respect to the new knowledge or skills on CAR. Teacher C and D were in the Orientation level, meaning that they were just beginning to seek information more to learn about conduct CAR. At last, teacher B was in the Preparation level, meaning that she had acquired the new knowledge and skills and was getting ready for use.

5.5.3 Summary

As discussed in the literature review, this section summarised the final outcomes measured in terms of the expected outcomes of the programme, primarily the impact of CAR on teachers into three variables: (1) classroom practice, (2) personal level, and (3) interpersonal level. With regard to teaching changes in classroom practice, it seemed that the use of CAR for classroom practice was still an unimplemented plan for all teachers in Programme Version II. They admitted there is no impact from the programme on their classroom practice so far. Nevertheless, they were still in the problem formulation phase and had not finalised their research question. They thought that their needs were not met in the programme or the contents did not help them to use CAR for classroom practice. In terms of personal level, all teachers claimed that improving their scores from Teacher Competency Test (*Ujian Kompetensi Guru*) was what they understood as their own personal development. In terms of the use of CAR for interpersonal level, it was hard to find participants who had use CAR to encourage collaboration with other teachers or students. The level of sharing and discussing with other teachers was also superficial. Finally, this study also examined the LoU of CAR implementation. All teachers had not shown signs in using CAR in the previous discussion. They were all still in "No Use" level only except teacher B who was already in the Preparation level as she had acquired new knowledge and skills and was getting ready for use.

6 CASE STUDY 3: CLASSROOM ACTION RESEARCH PROGRAMME VERSION III

This chapter presents the last case of this study. Programme Version III was a programme held by the head of school for his own teachers to learn about CAR. The programme was a one-day training course held at the school on a Saturday. This chapter explores the impact on teacher learning and development. For each RQ, the findings from the survey observation and interview data have been combined and presented under headings reflecting the key components of the conceptual framework (see Figure 24). It is organised in six sections as follows.

Section 6.1 provides information on teachers and the reasons they gave for undertaking the programme.

Sections 6.2 – 6.6 provide the data for RQ1 to RQ4, with each section focusing on a key component in the conceptual framework.

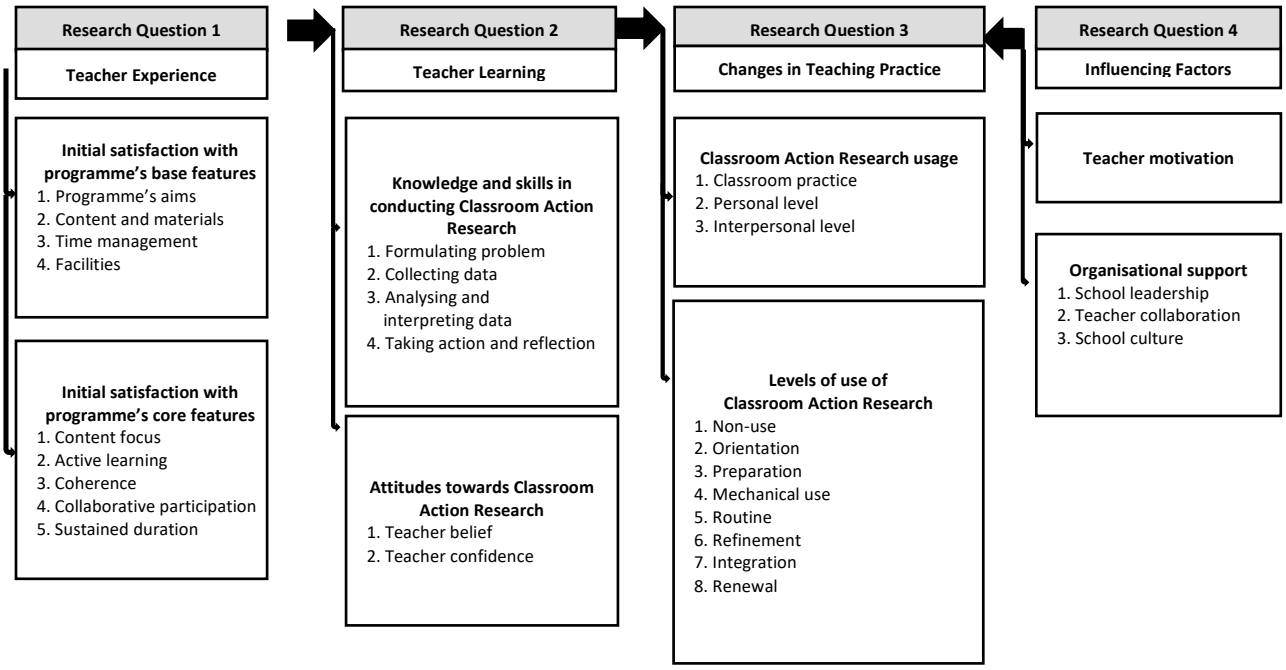


Figure 24. Conceptual framework of my study

As presented in Chapter 4, all 20 teachers responded to the survey. Of these, four were interviewed three months after the programme ended at their school. This chapter draws on the following data: 20 questionnaire survey responses; interview with the trainer; my observation notes; and interviews with four teachers and their CAR projects.

6.1 TEACHERS' PROFILE

This section presents teachers' personal and professional backgrounds and seeks to find the relationships between their backgrounds, the programme features and their learning. It begins with an overview of their profile and followed by their motives. The profile is tabulated in Table 24. The data show that their professional backgrounds and experiences are varied.

Table 24. Teachers' profile

Teachers	Degree	Teaching Qualification	Teaching Subject	School Type
Teacher A	Bachelor's degree in Education	New teacher (Rank 2)	Science	Primary Private
Teacher B	Bachelor's degree in Education	Junior teacher (Rank 3)	Literacy	Primary Private
Teacher C	Bachelor's degree in Education	New teacher (Rank 2)	Literacy	Primary Private
Teacher D	Bachelor's degree in Education	New teacher (Rank 2)	Math/ Counseling	Primary Private

All four teachers were graduates having a Bachelor degree in Education (A, B, C, and D). With regard to the second category, three of them are new teacher with Rank 4 qualification (A, C, and D) and one junior teacher (B). Regarding teaching subject, there were two Indonesian literacy (B and C), one science (A), and one math/counseling (D). They worked in the same private primary school.

The 20 survey respondents identified similar reasons for undertaking the programme. The survey had four yes/no response options for their motivation in following the programme: personal career development, getting new information and knowledge, head of school's order, and government requirement. Table 25 below summarises the frequencies and percentages of what teachers said their purposes were in following the CAR programme.

Table 25. Teachers' response about their purposes in following the programme (n=20)

Reasons	Frequency (percentages)
Personal career development	17 (85%)
Getting new knowledge	17 (85%)
Head of school's request	20 (110%)
Government requirement	0 (0%)

In general, all teachers said that they joined the programme because of their head of school's request. 85% of teachers did it because they wanted to get new information and knowledge from the programme and wanted to develop their personal career development. The interviews of teachers from the programme showed similarities and differences of teachers' motivations in following the programme.

The interview data showed teachers were very motivated to attend the programme for their PD, as four teachers (A, B, C and D) were requested to join the programme by their head of school, which they willingly took. The head of school intended to introduce CAR to his teachers as he considered that most of them had not had any understanding, knowledge or training about it. He said, "*I feel that CAR is important. Therefore, my teachers need to learn about it*". Regarding teacher expectations, most teachers had not followed any CAR programmes before, so their motive in following the training was only to know what CAR was. A teacher said in the interview, "*I was asked by the head of school to follow this programme. Since this was my first time following a CAR programme, I just wanted to know what CAR really was*". In my observation, these teachers were excited to learn about CAR for the first time. There were also some teachers who had undertaken CAR programme and/or known what CAR was. These teachers' intention in following the training was to update or refresh their memories and/or add to their knowledge of it. In the interview, a teacher gratefully shared that, "*The head of school asked me to attend this programme. I have already known about CAR before, so the reason I attended is because I just want to refresh my previous knowledge*". Teachers' reason in undertaking the programme were similar due to their backgrounds as new teachers who had not done CAR before. However, it is of interest what kind of supports and difficulties teachers experienced and how the programme provider had tried to address these. Therefore, how the programme interacted with teachers' reason is an interesting issue to be investigated further.

6.2 TEACHER EXPERIENCE

This section provides information on the findings for RQ1: "what are teachers' experiences of the programme?". This level represents the features or activities of a programme as the inputs or the interventions (see Figure 24). It explores teachers' individual experience and views of the programme. It begins by analysing teachers' views on the base features of the programme: its aims, content, time management and facilities, followed by analysing teachers' view on the core features of the programme: active learning, collaboration, content focus, coherence, and sustained duration.

6.2.1 Programme's base features

This section explores teachers' views of the base features of the programme: its aims, content, time management and facilities. To do this, various sources of data were used, including the programme details form, observation data, questionnaire data and interview data.

Programme's aims

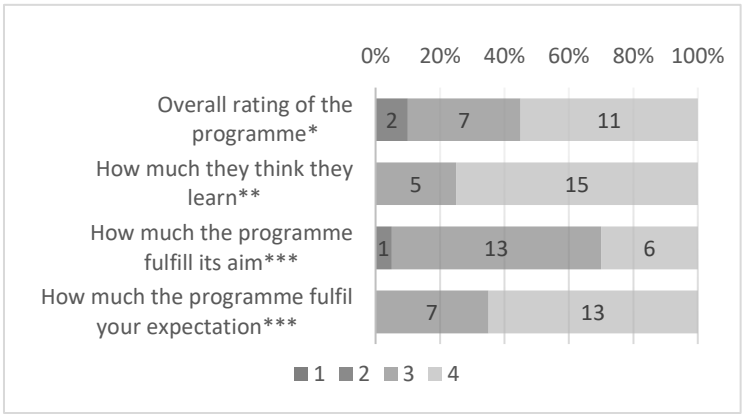
Interview with the trainer showed that the main purpose of the programme was just to introduce CAR and motivate teachers to conduct CAR into their teaching practice. He added that because the main purpose was just to motivate teachers without having any concern to make sure that they could conduct CAR, he shared his own experiences to inspire them. He talked about his achievements in winning CAR project respectively held by the government and a private institution, and how that made him into an accomplished teacher and eligible CAR trainer. He

realised that new teachers need more inspiration rather than a comprehensive programme about CAR. The trainer's aim matched with the teachers' as they came to the programme with the same specific expectation *i.e.* just to know about CAR.

Questionnaire surveys revealed that teachers' immediate responses to the programme were positive. It is shown from the survey analysis below that teachers' overall rating of the programme and how much they think they learn have a relatively high mean score of 3.45 and 3.75 with a modal score of 4. Moreover, teachers also thought that the programme met its aims and their expectations fully. It is shown from the survey analysis below that the programme's aims and teachers' expectations were met with relatively high mean scores of 3.25 and 3.65 with a modal score of 3.

Table 26. Mean and standard deviation of the questionnaire on teacher initial response to the programme (n=20)

Teachers' response	Mean (SD)
Overall rating of the programme*	3.45 (.68)
How much they think they learn**	3.75 (.44)
How useful was the programme in fulfilling its aims***	3.25 (.55)
How useful was the programme in fulfilling your expectation***	3.65 (.48)



* four-point scale, rating from 1= 'not satisfied' to 4= 'very satisfied'
** four-point scale, rating from 1= 'nothing' to 4= 'very much'
*** four-point scale, rating from 1= 'nothing' to 4= 'fully'

Figure 25. Teachers' initial response to the programme (n=20)

Based on the interview data, all teachers had incredibly positive responses to the programme. They said that they were happy to follow the programme. They particularly appreciated that the trainer was very motivating, inspiring, and full of exciting experiences. Teacher A expresed her satisfaction as "amazing trainer , I want to be like him someday". Others similarly reported that they enjoyed the programme, felt motivated to conduct CAR and understood the importance of CAR. The surveys and interview data showed that the aims of the programme are consistent with teachers' reason to get to know about CAR.

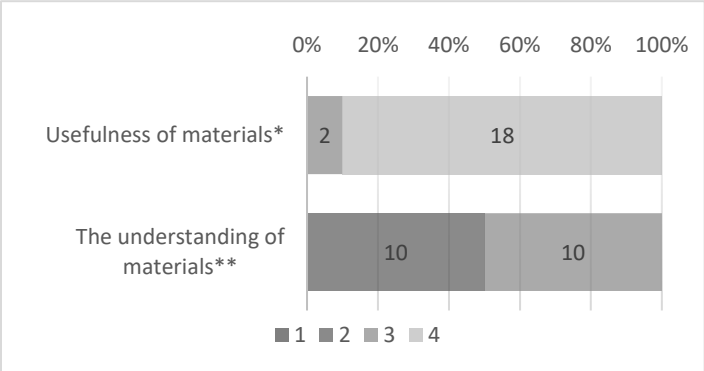
Content and materials

The programme discussed three main topics: (1) The reasoning and importance of CAR, (2) Conducting CAR, and (3) Making CAR proposal and report. From my observation of the programme, regarding the first topic of the programme, the provider gave a lot of inspiring stories and experiences from himself, as he started as a regular teacher and conducting CAR was what made him to be an accomplished teacher and being recognised by other teachers and the government by authoring a book about his research. He also presented several video clips showing qualifying CAR models and activities to help teachers' understanding of how to conduct CAR. Regarding the third topic, the provider did not suggest any strategies in drafting CAR proposal and report or teach writing skills by providing exemplary lessons.

The questionnaire surveys show that teachers thought that the content materials were useful and easy to understand. The mean score of the usefulness of materials is 3.90 with the modal score of 4. This means teachers mostly agreed with the statement that the content materials were useful. The mean score of the understanding of materials is a relatively high score of 3.50, which means teachers found that the materials were easy to understand. The mean and standard deviation of the content materials are presented in Table 27.

Table 27. Mean and standard deviation of the questionnaire on teachers' response to the programme materials (n=20)

Programme Materials	Mean (SD)
Usefulness of materials*	3.90 (.30)
The understanding of materials**	3.50 (.51)



* four-point scale, rating from 1= 'not useful' to 4= 'totally useful'
** four-point scale, rating from 1= 'hard to understand' to 4= 'easy to understand'

Figure 26. Teachers' response to the progamme materials (n=20)

Based on the interview data, teachers' immediate responses were very positive. From teachers' perspective, they saw the materials as especially useful and easy to understand. A teacher complimented, "*The materials were easy to understand and motivating*". However, teachers were in line with the trainer saying that the materials were not practical enough for them to

conduct CAR into their teaching practice, but merely to motivate them only, such as a section in the materials narrating the trainer's success in becoming an accomplished teacher by conducting CAR. As one teacher said, *"I feel like I want to conduct CAR, but I need to learn more from another CAR programmes or sources*".

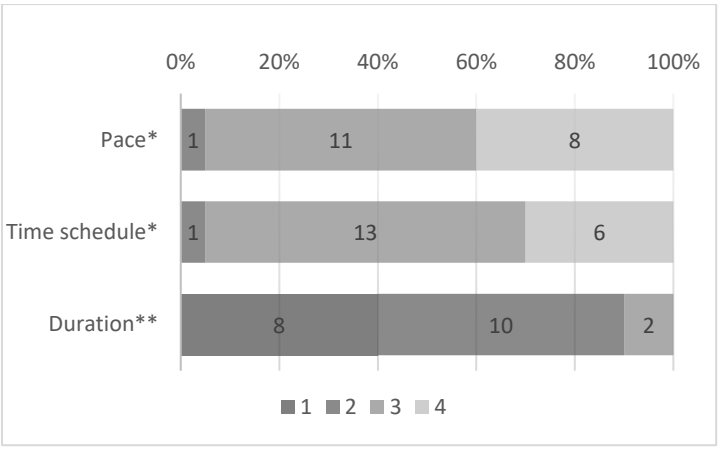
Time management

The programme was a one-day training course held on the weekend (Saturday), outside teachers' working days. It started from 8 AM to 4 PM. There was a break for an hour from 12 PM to 1 PM. The first topic took four hours, while the second took three hours. There was a misunderstanding between the trainer and the head of school. The trainer intended to have two sessions, each session lasting for an entire day. Meanwhile, the head of school thought that the two sessions would be done in one day only. However, they resolved by having one-day training only. The trainer commented "*By having only one day for two sessions, I only had brief time to discuss the materials*."

From the survey, the mean and standard deviation of the time management are presented in Table 28 below. The pace of the programme received a relatively high mean score of 3.35 with a modal score of 3. This means teachers were satisfied with the pace of the programme. For the time schedule, the mean score is also relatively high of 3.25 with the modal score of 3, as teachers were content with the scheduled time the programme offered. However, the mean score of duration is relatively low of 1.70. This is because teachers thought that the programme was very short in duration. Moreover, the interviews with teachers showed a deeper understanding of how teachers perceived time management from the programme.

Table 28. Mean and standard deviation of the questionnaire on teachers' response to the time management of the programme (n=20)

Time management	Mean (SD)
Pace*	3.35 (.58)
Time schedule*	3.25 (.55)
Duration**	1.70 (.65)



* four-point scale, rating from 1= 'very bad' to 4= 'very good.'
** four-point scale, rating from 1= 'too short' to 4= 'very good'

Figure 27. Teachers' response to the time management of the programme (n=20)

The interview data revealed that all teachers agreed that the programme was too short. One of them said, "*The programme was too short we did not have enough time to learn about CAR in such brief time and there would not have been reflection time*". The tempo of the lecture of both sessions, however, was quite a problem for the trainer as he just knew that morning about the duration of the training from two days into one day only. However in my observation, teachers did not complain about the tempo of the sessions as the trainer compressed his two-day lecture into one.

Facilities

Teachers were satisfied with the room management, location, building facilities and meals of programme. This was shown from the relatively high mean score of each variable: room management with 3.85, location with 3.85, building facilities with 3.45 and meals with 3.65 and all with the modal score of 4. Moreover, the interview of teachers showed a deeper understanding of how teachers perceived the facilities from the programme. Table 29 below presents the mean and standard deviation of view about the facilities.

Table 29. Mean and standard deviation of the questionnaire on teachers' response to the porgamme facilities (n=20)

Facilities	Mean (SD)
Location*	3.85 (.36)
Room management*	3.85 (.36)
Building facilities*	3.45 (.68)
Meals*	3.65 (.48)

* four-point scale, rating from 1= 'very bad' to 4= 'very good.'

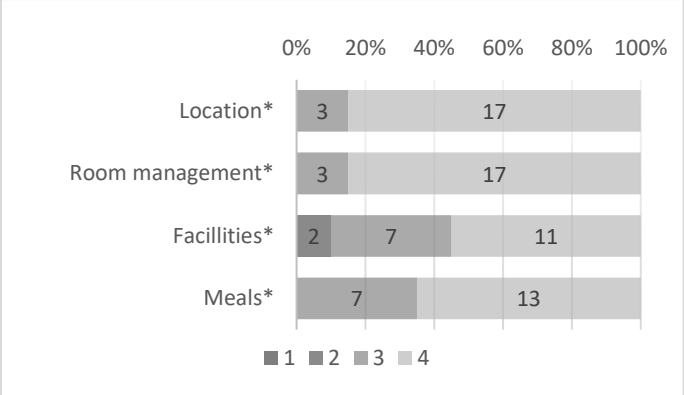


Figure 28. Teachers' response to the programme facilities (n=20)

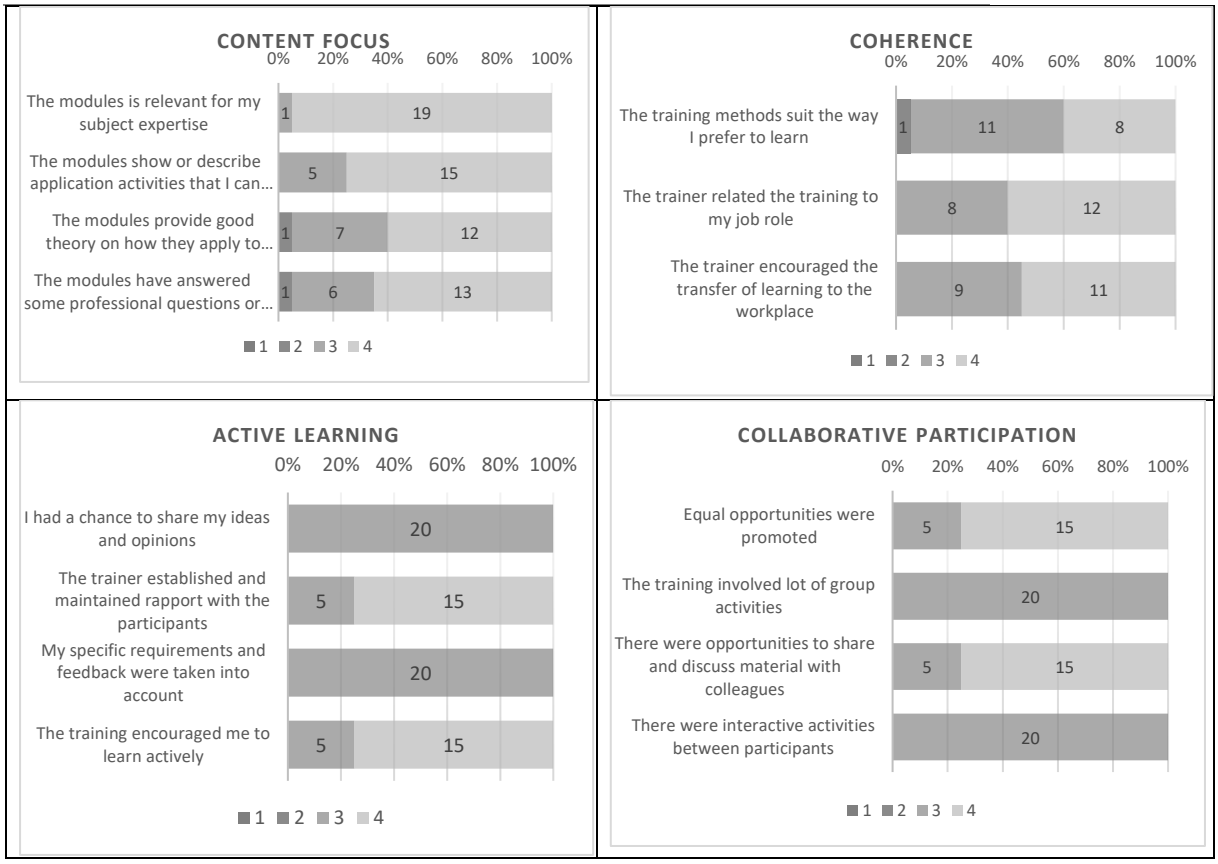
The programme was held at the teachers' school. Since it was their own school, they found it convenient as it was located not far from their houses, easy to locate and access, and conducive for learning activities. Meanwhile about the facilities, the room used for the training was a classroom with capacity for a maximum of 25 people having the seats arranged into letter-U which made it easier for them to interact with the trainer. It was adequate to the 25 participants. There was, however, a problem with the projector. It was off for about 10 minutes in the middle of a session. However, the trainer handled it well by giving an icebreaking session while waiting for the projector fixed. All people involved in the training were given a meal, hot beverages (tea and coffee) and snacks. Overall, both trainer and teachers were satisfied with the facilities of the programme.

6.2.2 Programme's core features

Based on the survey, teachers' view on active learning received a mean score of 3.55. This is a relatively high score which means teachers generally agreed that active learning occurred during the programme. For example, most of the teachers agreed with statements such as: "*I had a chance to share my ideas and opinions*" and "*The programme encouraged me to learn actively*". Concerning collaboration, most of the respondents agreed with statements such as: "*The programme involved a lot of group activities*" and "*There were interactive activities between participants*". It is noteworthy that collaboration received a relatively high mean score of 3.23. Regarding coherence, most teachers agreed that the programme's methods suited the way they preferred to learn and with their role in their workplace. It is shown in the mean score of coherence which reached a relatively high mean score of 3.50. Finally, the content focus received a mean score of 3.71. This is also a relatively high score, meaning that teachers generally agreed that the programme was content-focused. For example, most of teachers agreed with statements such as: "*The programme shows or describes application activities that I can readily implement in my classroom*" and "*The programme is relevant for my subject matter*". The mean and standard deviation of the programme features are presented in Table 30 below.

Table 30. Mean and standard deviation of the questionnaire on teachers' response to the core features of the programme (n=20)

Programme features	Mean (SD)
Active learning*	3.55 (.42)
Collaborative participation*	3.23 (.73)
Content focus*	3.71 (.38)
Coherence*	3.50 (.45)



* four-point scale, rating from 1= 'totally disagree' to 4= 'totally agree'

Figure 29. Teachers' response to the statements about core features of the programme (n=20)

The next section reports the analyses from the interview of teachers based on the five variables of the programme features from the conceptual framework.

Content focus

The programme was not a content-focused training. It could be seen from the materials given to teachers, which were general about CAR without being specific to each teacher's subject knowledge. It was confirmed by the trainer as he was only ordered by the head of school to design the training just for the introduction of CAR in general only. A teacher wondered, "*I am still confused what the best method is to overcome my problems in teaching English*".

Active learning

Programme Version III had low active participation from teachers. The only active participation occurred during the programme was in the Q&A session in the end of each session. The trainer explained, "*Due to the time limit, there was not a lot of time slot for teachers to build active learning*". Teachers also agreed that there was not any active participation. One teacher said, "*I hope there was more practice than just a seminar".*

Collaborative participation

In the programme, there were no collaborative activities among teachers. As the trainer explained before, this was due to limited time which made him unable to insert collaborative activities. The teachers confirmed the trainer's saying that they did not collaborate with each other during the programme. One teacher said, "*For a moment, there was a brief discussion between me and my colleague about the materials, but that was just it. A moment after, we were back focusing on the materials on our own*".

Coherence

The programme was coherent with teachers' expectation sand prior understanding. The objective of the programme was to gain motivation and introduce CAR as most of the teachers had not had any knowledge or motivation about CAR before. Such coherence was achieved when the programme was done, and teachers were motivated and finally introduced to CAR. The trainer in his statement said, "*I was asked by the head of school to train the teachers to motivate and introduce them to CAR as most of them lacked the understanding of it*". Teachers' opinions were also in line with the trainer's. Most of them acknowledged their lack of understanding and were happy with the programme and felt motivated about CAR.

Sustained duration

The programme was a one-day training without any follow-up programme after. The trainer explained that because the objective of the programme was to gain motivation only, he handed over the follow-up to the head of school because the head of school was expected to be able to encourage as well as monitor his teachers' development. From the teachers' perspective, because of their lack of understanding about CAR, they felt satisfied already with the programme without having any thoughts that it needed to be followed up. A teacher once said, "*As the programme had no follow-up and at the same time I am busy with the school, I have no time to begin my CAR project*".

6.2.3 Summary

This section summarised the overall teachers' experience and views of the programme. Regarding the aims of the programme which were to improve understanding of CAR and

develop motivation in conducting CAR, the programme precisely met teachers' needs. Teachers showed very positive responses to the programme immediately after the programme ended. The challenge between the programme's aims and the teachers' needs seemed to be resolved by the strategies and resources used by the provider. Firstly, the trainer used experiences and inspiring stories to engage teachers' motivation. Secondly, the content materials were highly valued and helped them understand CAR better. From teachers' perspective, they saw the materials are easy to understand and enjoyable. At last, teachers were also satisfied with the time management, location, and building facilities of the programme. However, all of them pointed out that more time was needed for the programme. They suggested that it needed to be longer to improve the whole programme.

Data showed that the strategies and engagement of the programme were not consistent with four of the five core features of a PD programme to promote conditions for teacher learning. Firstly, the programme had low active participation from teachers. Secondly, there were no collaborative activities among teachers. This was due to the limited time which made him unable to insert active and collaborative activities. Next, the programme was not content-focused. It could be seen from the materials given to teachers, which were general about CAR without being specific to each teacher's subject knowledge. Finally, the programme has no sustained duration as the programme was a one-day training without any follow-up programme after. The trainer handed over the follow-up to the head of school because the head of school was expected to be able to encourage as well as monitor his teachers' development. Regarding coherence, the programme was coherent with teachers' expectations and prior understanding. The objective of the programme was to gain motivation and introduce CAR as most of the teachers had not had any knowledge nor motivation about CAR before. Such coherence was achieved when the programme was done, and teachers were motivated and finally introduced to CAR.

6.3 TEACHER LEARNING

This section provides information on the findings for RQ2, "What do teachers learn from the programme?". This level is considered as the pre-condition that enables the attainment of the final outcomes which are the changes in teaching practice (see Figure 24). It identifies the increase in teachers' knowledge and skills and the changed attitudes towards CAR, that might enable them to change their practice.

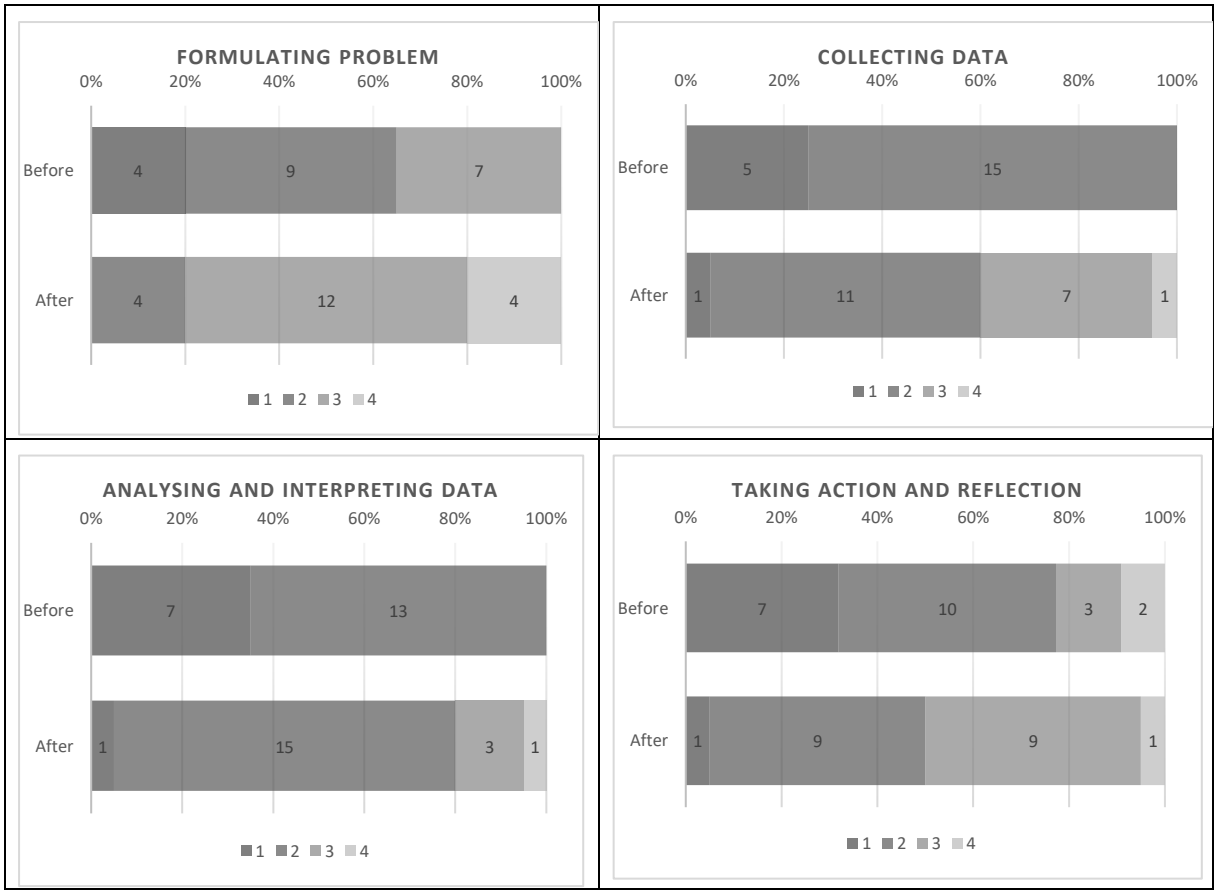
6.3.1 Knowledge and skills in conducting CAR

Based on the survey, regarding how to formulate a problem, teachers' response in their changes received a relatively high mean score of 3.00 with a modal score of 3. This most of teachers from the programme generally claimed that they knew how to formulate a problem after the programme. Concerning how to collect data, it received a relatively low mean score of respectively 2.40 with a modal score of 2. About data analysis, it received a relatively low mean score of respectively 2.20 with a modal score of 2. Concerning action-taking and reflection, it received a relatively low mean score of respectively 2.58 with a modal score 2. This is because

more than half the teachers claimed they still did not know how to collect and analyse data and how to take action and reflect after the programme. Finally, although the mean score of all knowledge and skills after the programme is relatively higher than before the programme, there is no significant difference between them. The mean and standard deviation on teachers' responses to their knowledge and skills before and after of each programme are presented in Table 31 below.

Table 31. Mean and standard deviation of questionnaire on teachers' knowledge and skills before and after the programme (n=20)

Knowledge and skills	Mean (SD)	
	Before	After
Formulating problem	2.15 (.74)	3.00 (.64)
Collecting data	1.75 (.44)	2.40 (.47)
Analysing and interpreting data	1.65 (.48)	2.20 (.51)
Taking action and reflection	1.80 (.69)	2.50 (.50)



* four-point scale, rating from 1= 'No knowledge and skills' to 4= 'very good

Figure 30. Teachers' rating to their knowledge and skills before and after the progamme (n=20)

The next section reports the analyses from the interviews with teachers based on the four variables of knowledge and skills from the conceptual framework.

Formulating problem

All four teachers interviewed claimed that they learnt how to formulate problems. However, only two out of four had started to formulate the problem in their classrooms for their own research within weeks. Teacher A teacher said, "*I have been thinking about students' lack of creativity in writing narrative story. I got an idea of the effect of pictures towards students' ability to write a narrative text*". Teacher C said that her problem was about students' vocabulary in English. Teacher D who was a math teacher as well as a counseling one had his mind on student's motivation issues and the solution. Nevertheless, these teachers were still in the problem formulation phase and had not finalised the research question. Meanwhile, teacher B admitted that she had yet formulated any problem.

Collecting, analysing, and interpreting data

Teachers from Programme Version III did not learn about data collection, analysis, and interpretation from the programme. They claimed that they were introduced to only the general concept, but they had not done anything about it. Most teachers suggested that to improve the programme, they needed to have more opportunities for hands-on activities. Teacher A and B suggested that it would have been better if the programme allowed them more time to try the experiments by themselves. Although teachers' main intention to follow the programme was to get the ideas about CAR, in the interview, they claimed that they also wanted to try out practicing CAR. Teacher D got some ideas to interview student face-to-face regarding their motivation, but he still lacked knowledge of making the instrument let alone analysing them. Teacher C who was trying to improve students' vocabulary in English was still wondering how to track their progresses with her new method.

Taking action and reflection

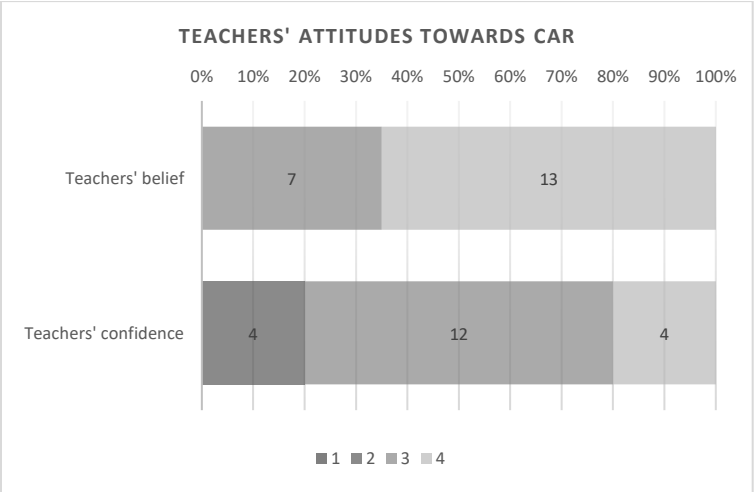
In this section, teachers were introduced to the general knowledge of the last step in CAR cycle: action-taking and reflection. They have been shown some examples of CAR reflection activities from other teachers. Some teachers got inspired and tailored it to their specific needs in their school. Teacher A wanted to learn how to interest students in certain literacy topics which before she had found it difficult to make them interested, she learnt from the examples of teacher using pictures to stimulate students' interest in certain topics. Teacher D took an inspiration of using face-to-face interview with students to get to know them better. However, all teachers still had not taken any action towards it. Most of them claimed that they are busy with school activities and they suggested that the follow-up to the programme was what they need to actually conduct what they learnt from the programme.

6.3.2 Attitudes towards CAR

Based on the survey concerning attitudes towards CAR, teachers' belief on the programme received a relatively high score of 3.65 with modal score of 4. This means teachers generally agreed that they believe in the importance of CAR. Meanwhile, teachers' confidence also received a relatively high mean score, even though not as high as teachers' belief, 3.00 with a modal score of 3. This also means that teachers generally agreed on their confidence in conducting CAR. However, regarding the difference between teachers' attitudes towards CAR before and after the programme, it received a relatively low mean score of respectively 2.40 with a modal score of 2. This is because less than half the teachers agreed that the programme had an impact on their attitudes towards CAR. The mean and standard deviation of teachers' response on how far attitudes towards CAR improved are presented in Table 32 below.

Table 32. Mean and standard deviation of the questionnaire on teachers' response to their attitudes towards classroom action research (n=20).

Attitudes towards CAR	**Mean (SD)**
Teachers' belief	3.65 (.48)
Teachers' confidence	3.00 (.57)
Impact on attitudes towards CAR	2.40 (.47)



* four-point scale, rating from 1= 'not important to 4= 'very important'
** four-point scale, rating from 1= 'not confident to 4= 'very confident'

Figure 31. Teachers' response to their attitudes towards CAR (n=20)

From the interviews, all teachers believed that CAR was important before and after the programme. Most of them added that it could help solve their teaching problems. However, none of them mentioned the importance of CAR besides classroom practice (for example: for personal development or school development). Regarding the confidence in conducting CAR, teachers claimed that the programme motivated them to conduct CAR. However, they were still

not sure whether they were able to conduct it. They thought they still needed follow-ups or more programmes to make them more confident of their ability. Teacher C said she did not think her confidence improved after programme as she had never conducted CAR before. Her response supports the importance of knowing the teachers' needs and having the opportunity to practice it in the programme.

6.3.3 Summary

This section summarised the overall teachers' changes in knowledge, skills and attitudes towards CAR. Teachers' changes in knowledge and skills of CAR involved four aspects of changes: formulating problem; collecting data; analysing and interpreting data; and reflecting and taking action. Data showed that all teachers only had improved their knowledge and skills on one aspect. Changes in problem formulation skills were the most eminent outcome. All claimed that they learnt how to formulate problems. The reason teachers understood the problem formulation is because the trainer taught by including examples based on his own experience. However regarding data collection, teacher did not learn about data collection from the programme. They claimed that they were introduced to only the general concept, but they had not done anything about it. On the other hand, regarding teachers' belief towards CAR, most teachers already had their belief towards CAR and, thus, the impact of the programme on their belief was not significant. Most of them added that it could help solve their teaching problems Meanwhile, teachers reported that their confidence in conducting CAR had not considerably improved compared to their confidence before the programme. However, they were still not sure whether they were able to conduct CAR. They thought they still needed follow-ups or more programmes to make them more confident of their ability.

6.4 INFLUENCING FACTORS

This section analyses and discusses the findings for RQ3: "What are the organisational factors in schools that promote or hinder teachers in using CAR to improve their teaching practice?". This outlines how schools act as a promoting or hindering factor in the implementation of the programme. These factors are variables in the external environment of the programme (school and wider environment) that regulate how interventions are implemented and explain why similar intervention activities have diverse outcomes across different individuals (see Figure 24). Based on the conceptual framework, the impacts of the influencing factors in schools that promote or hinder teachers in using CAR were divided into two variables: (1) teacher motivation; and (2) organisational support.

6.4.1 Teacher motivation

The interview data showed that teachers were very motivated to attend the programme for their PD, as four teachers (A, B, C and D) were requested to join the programme by their head of school, which they willingly took. The head of school intended to introduce CAR to his teachers as he considered that most of them had not had any understanding, knowledge or training about it. He said, "*I feel that CAR is important. Therefore, my teachers need to learn about it*".

Regarding teacher expectations, most teachers had not followed any CAR programmes before, so their motive in following the training was only to know what CAR was. A teacher said in the interview, "*I was asked by the head of school to follow this programme. Since this was my first time following a CAR programme, I just wanted to know what CAR really was*". In my observation, these teachers were excited to learn about CAR for the first time. There were also some teachers who had undertaken CAR programme and/or known what CAR was. These teachers' intention in following the training was to update or refresh their memories and/or add to their knowledge of it. In the interview, a teacher gratefully shared that, "*The head of school asked me to attend this programme. I have already known about CAR before, so the reason I attended is because I just want to refresh my previous knowledge*". Teachers' reason in undertaking the programme were similar due to their backgrounds as new teachers who had not done CAR before. However, it is of interest what kind of supports and difficulties teachers experienced and how the programme provider had tried to address these.

6.4.2 Organisational support

Organisational support discusses school leadership, collaboration, and school culture. Each variable is explained below.

School leadership

All four teachers interviewed agreed that their head of school encouraged the use of CAR. They felt that there was a supportive culture and that they had the freedom to do what they wanted. In particular, teacher D felt his head of school was open with any kind of suggestion from teachers regarding CAR activities. Teacher A added that the head of school had a vision for the school to be a research-based school and that was why he initiated the training programme as a way to achieve his vision. However, it seemed the head of school still lacked experience and knowledge in CAR as well. Teacher C added, "*He is more of an encouraging type of head of school rather than a supervisor towards our CAR project*." Teacher B said, "He wants to learn together with teachers in this programme and help each other on their own CAR project."

Teacher collaboration

Regarding collaboration, one interesting aspect is that teachers' views on collaboration in their school were different from one another despite working in the same school. Teacher A said that his colleagues were enthusiastic about planning collaboratively. In her department, sharing was facilitated through informal meetings (which happened almost daily), and departmental meetings also provided opportunities to discuss teaching and learning. However, teachers did not seem to work collaboratively, but just to share ideas and strategies of CAR among them. Teacher B also stated that her colleagues planned together, but she had two contrasting views on the school culture of sharing and discussing. On one hand, she thought that teachers "always discuss" informally, because they had office and they were ready to help. On the other hand, she also mentioned that teachers did not engage in conversations about ways to improve CAR "unless you have something in particular", and she seldom asked colleagues to help her. It

seemed that having an office created a condition for teachers to share experiences and practice, but they seemed to prefer working independently unless they had a problem. Therefore, it was not clear whether their CAR planning and discussion had supported each other's teaching sufficiently and sustainably. Overall, it seemed to be the interaction between the individual teachers and the school context and culture that determined the degree of teacher collaboration.

School culture

All teachers thought that the main school policy by which they were supported were programmes in their schools and out-of-school PD programmes. However, programmes in their schools tended to be decided by the head of school and to deal with whole school issues and government requirements rather than discussing teachers' individual needs. It seemed not to satisfy teachers who had subject specific needs. Some teachers found outside programme was useful. Out-of-school PD programmes were another popular type of teachers' PD opportunity supported by the school policy. These seemed to be suitable to meet teachers' subject specific needs although opportunities were limited. However, relying mainly on external PD funds is likely to be a problem in the future, as it is a temporary solution to lack of school funds and some teachers often doubted whether their time was 'best spent'.

As well as the traditional forms of PD opportunities, teachers mentioned alternative types of PD activities to encourage CAR in their school: collaborative planning time, a performance meeting, and CAR team project. Although the types of activities were varied, the impact of the activities on teachers seemed to depend on the school culture rather than the school policy itself. For instance, teacher B mentioned that her school ran a collaborative planning time session once a term to provide an opportunity for teachers who wanted to share their progress and result. However, teachers in the school seemed not to use the time for collaborative planning, because some teachers were not enthusiastic about learning from other teachers. This showed that without a culture of collaboration, the scheduled time for collaboration could hardly affect how teachers worked. I noticed that different teachers had different views on their school policy. For example, teacher A did not mention that there was CAR team project in her school, whereas teacher C mentioned that he is part of a CAR team project. Finally, departmental meetings also provided teachers with opportunities to share ideas and resources. The formal meetings were once or twice a month and dealt with departmental issues, but some teachers (teacher B and C) also talked about their CAR plan with their colleagues.

6.4.3 Summary

This section summarised on how schools act as a promoting or hindering factor in the implementation of the programme. Regarding head of school characteristics, teachers interviewed agreed that their heads of schools encouraged the use of CAR. They felt that there was a supportive culture and that they had the freedom to do what they wanted. Regarding collaboration, one interesting aspect is that the views on collaboration in their schools were different among teachers working at the same school. It seemed to be the interaction between the individual teachers and the school context and culture that determined the degree of teacher collaboration. Finally, the research data in this case study showed that school policy played an

important role in encouraging teachers in using CAR. All teachers thought that the main school policy by which they were supported were programmes in their school and out-of-school PD programmes. However, programmes in their school tended to be decided by the head of school and to deal with whole school issues and government requirements rather than discussing teachers' individual needs. As well as the traditional forms of PD opportunities, teachers mentioned alternative types of PD activities encouraging CAR in their school: collaborative planning time, a performance meeting, and CAR team project.

6.5 CHANGES IN TEACHING PRACTICE

This section analyses and discusses the findings for RQ4: "What changes are there to teachers' teaching practice?". The last process is the final outcomes measured in terms of the expected outcomes of the programme, primarily the impact on teachers (see Figure 24). Based on the conceptual framework, the impacts of the programme on teaching practice were divided into: (1) CAR usage, and (2) levels of use of CAR. CAR usage discusses classroom practice, personal level, and interpersonal level. Levels of use of CAR discusses teachers' level of use of CAR into their teaching practice. The section is organised in two parts below.

6.5.1 CAR usage

CAR usage consists of classroom practice, personal level, and interpersonal level. Each discussion is explained below.

Classroom practice

With regard to teaching changes in classroom practice, all teachers intended to use CAR result to improve classroom practice. However, all teachers had not used CAR for their practice because mainly due to the lack of time. They all admitted that CAR were not bad ideas and they would use it to improve CAR practice if they could find the time. Nevertheless, they were still in the problem formulation phase and had not finalised the research question.

Personal level

Data revealed that there was no impact of CAR on teachers' personal development, meaning that there was a potential problem in the programme. Their reasons were the lack of knowledge and practical activities of CAR, which were necessary for them to conduct CAR confidently. Their awareness of this initiated their joining the programme, but the kinds of problems were different for each teacher. Although the PD programme generally met teachers' needs to gain motivation and knowledge of CAR, there were several limitations for teachers to achieve satisfactory outcomes as discussed in the previous sections.

Interpersonal level

Although most participant teachers did not collaborate, they shared and discussed teaching with their colleagues. Amongst other factors, informal meetings between teachers seemed to facilitate conversations between teachers the most, but the frequency and quality of the meetings seemed to depend on teacher characteristics. For example, teacher colleagues met at least once a week after school "to say what went well and what has not today". Teacher B had a weekly informal meeting with colleagues, which gave more opportunities to discuss and share CAR. The informal meeting with teachers was based on teachers' voluntary participation which was an important and effective way of facilitating teachers' collaboration, discussion and sharing.

6.5.2 Levels of use of CAR

This study examined the LoU of CAR implementation, which varied from "No Use" to the highest level of "Use". All teachers had not shown signs in using CAR in the previous discussion, meaning that they were all still in "No Use" level. Teacher A, B and C were in the lowest level of "No Use", which described individuals taking no action whatsoever with respect to the new knowledge or skills on CAR. Teacher D was in the Orientation level, meaning that he was just beginning to seek information and learn more about CAR. After the programme was held, all teachers upgraded their level from "No Use" of having absence in CAR involvement or implementation to "Orientation" as they have taken actions to learn more detailed information about CAR".

6.5.3 Summary

This section summarised the final outcomes measured in terms of the expected outcomes of the programme, primarily the impact of CAR on teachers into three variables: (1) classroom practice, (2) personal level, and (3) interpersonal level. With regard to teaching changes in classroom practice, all teachers intended to use CAR result to improve classroom practice. However, all teachers had not used CAR in their practice due to lack of time. In terms of personal level, data revealed that there was no impact of CAR on teachers' personal development, meaning that there was a potential problem in programme. Their problems were the lack of knowledge and practical activities of CAR, which were necessary for them to conduct CAR confidently. In terms of the use of CAR for interpersonal level, although most teachers did not collaborate, they shared and discussed teaching with their colleagues. Amongst other factors, informal meetings between teachers seemed to facilitate conversations between teachers the most. Finally, this study also examined the LoU of CAR implementation, which varied from "No Use" to the highest level of "Use". All teachers had not shown signs in using CAR in the previous discussion, implying that they were all still in "No Use" level. Teacher D was in the Orientation level, meaning that he was just beginning to seek information and learn more about CAR.

7 DISCUSSION

This study investigates the impact of a professional development (PD) programme about Classroom Action Research (CAR) on how teachers learn and change by using a framework developed and discussed earlier. This chapter aims to apply the conceptual framework for evaluation (see Figure 32), to assess its suitability for such evaluation, and to develop it by considering the evidence and application. This chapter not only has a particular focus on the impact of the PD programmes on teachers' experiences, learning, and change in teaching practice, but also identifies the key features of the programmes that contribute to the impact. Lastly, factors that influence teachers in engaging themselves on PD programmes about CAR like teachers themselves, their schools, and the government are also discussed in terms of how they develop the individual levels of learning and change. For each RQ, the discussions of the findings are presented under headings reflecting the key components of the conceptual framework (see Figure 32).

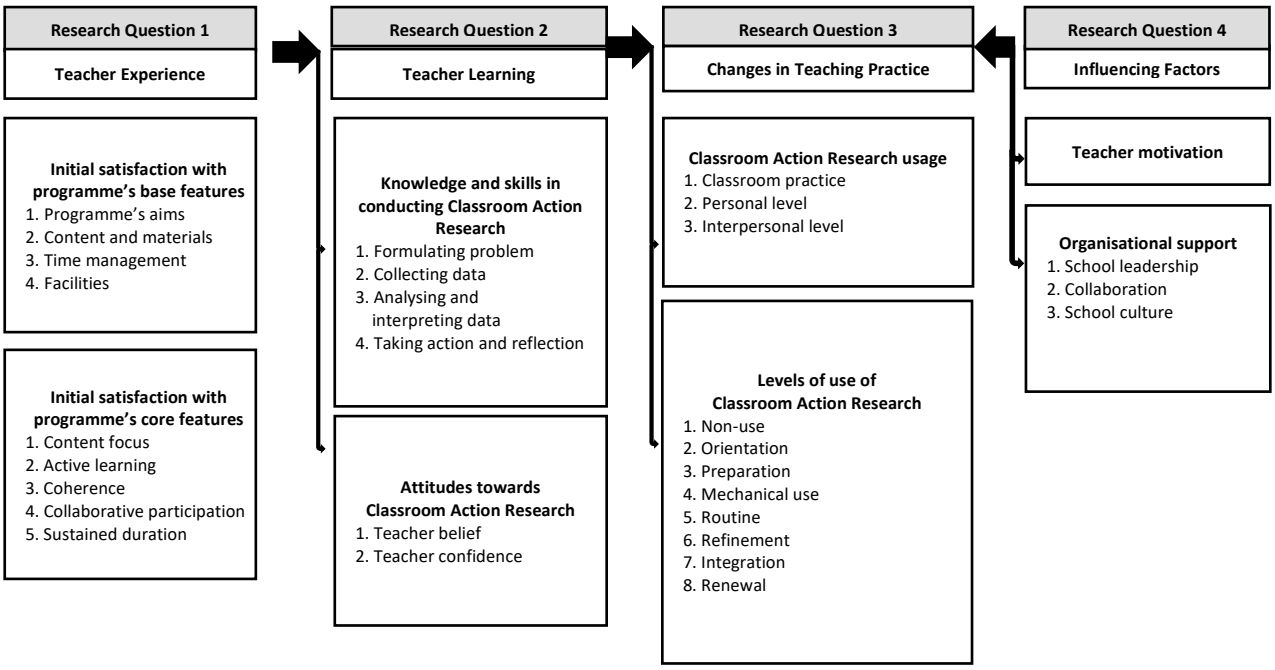


Figure 32. Conceptual framework of my study

For each RQ, the summary of the findings are presented under headings reflecting the key components of the conceptual framework (see Table 33).

Table 33. The summary of the findings

Research Question	Features	Version I	Version II	Version III
Teacher experience	Programme base features: 1. Programme's aims 2. Contents and materials 3. Time management 4. Facilities	1. **Programme's aims**: to help all teachers to improve their skills and understanding of CAR and develop greater confidence and competence in conducting CAR. 2. **Contents and materials**: Reasoning and importance of CAR, Conducting CAR, and Making CAR proposal and report. 3. **Time management**: three months. It was divided into three parts: the training day (one day), the CAR-facilitated implementation (three months), and the presentation day of their CAR reports supervised by the mentors (one day). 4. **Facilities**: held in an auditorium of the institution's university in east Jakarta for the first session and a hall for the second session; location was easily accessed; a meal, hot beverages (tea and coffee) and snacks were provided.	1. **Programme's aims**: for the invited teachers having the same teaching subject in Jakarta region to improve their score from Teacher Competency Test (*Ujian Kompetensi Guru*). 2. **Contents and materials**: four main topics: (1) The principle of CAR, (2) Conducting CAR, (3) Reflecting the result of CAR, and (4) Proposal-making. The trainer saw the materials only as a way for teachers to be able to pass the passing grade of Teacher Competency Test (*Ujian Kompetensi Guru*). **3. Time management**: a five-day programme on school days, from Monday to Friday. It was divided into four days of lecture and one day of the test itself. Each session was done in one day from 8 AM to 5 PM. 4. **Facilities**: held in a government facility. It was an old building located in the middle of an industrial area, far from teachers' houses and schools, not easy to locate and access as there was no public transportation going to/from there. Everyone in the programme were given a meal, hot	1. **Programme's aims**: the main purpose of the programme was just to introduce CAR and motivate teachers to conduct CAR into their teaching practice. 2. **Contents and materials**: three main topics: (1) The reasoning and importance of CAR, (2) Conducting CAR, and (3) Making CAR proposal and report. 3. **Time management**: The programme was a one-day training course held on the weekend (Saturday), outside teachers' working days. It started from 8 AM to 4 PM. 4. **Facilities**: held in a classroom at the teachers' school. Since it was their own school, they found it convenient as it was located not far from their houses, easy to locate and access, and conducive for learning activities. All people involved in the training were

			beverages (tea and coffee) and snacks.	given a meal, hot beverages (tea and coffee) and snacks.
	Programme core features: 1. Content focus 2. Active learning 3. Collaborative participation 4. Coherence 5. Sustained duration	1. **Content focus**: the programme was a partly content-focused training course. Session I was a seminar which was about general knowledge of CAR without having specific subject knowledge of the teachers, while in Session II and the follow-up programme, teachers were divided into groups of their area of expertise. 2. **Active learning**: active participation was the workshop in the second session. Teachers were divided into groups based on their area of expertise and asked to find a couple of problems of their own and discuss it with the others while being facilitated by a mentor. 3. **Collaborative participation**: the workshop in the second session encouraged collaborative activities. 4. **Coherence**: the programme was coherent with teachers' expectations and prior understanding about CAR as teachers expected in-depth learning about CAR.	1. **Content focus**: The programme was content-focused as it provided the participants with the materials for the test. 2. **Active learning**: the programme had active participation in every session. Such active participation was seen when teachers were divided into groups and asked to discuss a task from the daily worksheet with each other. 3. **Collaborative participation**: The programme had collaborative activities among teachers as they were divided into groups to discuss the daily task. 4. **Coherence**: The programme was partly coherent. It was coherent because a part of the teachers had an expectation of following the programme merely to improve their score. Meanwhile, another part had more expectations than just passing the test.	1. **Content focus**: The programme was not content-focused. It could be seen from the materials given to teachers, which were general about CAR without being specific to each teacher's subject knowledge. 2. **Active learning**: had low active participation from teachers. The only active participation occurred during the programme was in the Q&A session in the end of each session. 3. **Collaborative participation**: there were no collaborative activities among teachers due to limited time. 4. **Coherence**: The programme was coherent. The objective of the programme was to gain motivation and introduce CAR. Such coherence was achieved when the programme was done, and teachers were motivated and finally introduced to CAR.

		5. **Sustained duration**: The programme has sustained duration for a period of three months after the training day. During those months, teachers were followed up by their mentors about their CAR projects through emails, Whatsapp group, and/or one-to-one meetings.	5. **Sustained duration**: The programme was held annually having each batch lasting for a week (five days). As the objective of the programme was for teachers passing the test, the only follow-up was done to those who still failed the test. Those who passed the test would not get the follow-up programme from the government.	5. **Sustained duration**: The programme was a one-day training without any follow-up programme after.
Teacher learning	Knowledge and skills in conducting CAR: 1. Formulating problem 2. Collecting data 3. Analysing and interpreting data 4. Taking action and reflection	1. **Formulating problem**: all teachers were able not only to grasp the idea of problem formulation, but also did it themselves during the programme. 2. **Collecting data**: all teachers learnt new knowledge about data collection that made them understand data collection techniques. 3. **Analysing and interpreting data**: teachers not only showed that they understood theories of data analysis and interpretation, but they were also able to grasp the concept and to practice it. 4. **Taking action and reflection**: All teachers changed their knowledge and skills about the last CAR cycle *i.e.* action-taking and reflection that made them improve their own research.	1. **Formulating problem**: all teachers argued that there was no impact on their learning of problem formulation. 2. **Collecting data**: Teachers claimed that they did not learn about data collection, analysis, and interpretation in the programme. They were introduced to the general concept only. 3. **Analysing and interpreting data:** Teachers claimed that they did not learn about data analysis and interpretation in the programme. 4. **Taking action and reflection**: teachers were introduced the general knowledge of the last step in CAR cycle: action-taking and reflection. However, teachers claimed that they had not really grasped the idea of CAR in the programme as they were	1. **Formulating problem**: All teachers interviewed claimed that they learnt how to formulate problems. 2. **Collecting data**: Teachers claimed that they did not learn about data collection, analysis, and interpretation in the programme. They were introduced to the general concept only. 3. **Analysing and interpreting data:** Teachers claimed that they did not learn about data analysis and interpretation in the programme. 4. **Taking action and reflection**: teachers were introduced to the general knowledge of the last step in CAR cycle: action-taking and reflection. They have been shown some examples of CAR reflection activities from other teachers. Some

			taught CAR theories merely to the test.	teachers got inspired and tailored it to their specific needs in their school.
	Attitudes towards CAR: 1. Teacher belief 2. Teacher confidence	1. **Teacher belief**: all teachers already believed in CAR's importance before the programme. However, teachers' situation considerably influenced their belief in the importance of CAR. 2. **Teacher confidence**: their confidence in conducting CAR had considerably improved compared to their confidence before the programme. They claimed that what made them more confident was because their needs and expectations were fulfilled.	1. **Teacher belief**: all teachers believed that CAR was important before and after the programme. According to them, CAR was important because it was a requirement for teacher promotion, although some added that it could also help solve their teaching problems. 2. **Teacher confidence**: they claimed that there was no impact on their confidence after following the programme.	1. **Teacher belief**: all teachers believed that CAR was important before and after the programme. Most of them added that it could help solve their teaching problems. However, none of them mentioned the importance of CAR besides classroom practice (for example: for personal development or school development). 2. **Teacher confidence**: teachers claimed that the programme motivated them to conduct CAR. However, they were still not sure whether they were able to conduct it. They thought they still needed follow-ups or more programmes to make them more confident of their ability.
Changes in teaching practice	CAR usage: 1. Classroom practice 2. Personal level 3. Interpersonal level	1. **Classroom practice**: Most interviewees agreed that CAR helped them carry out a wider range of practical activities in the classroom. 2. **Personal level**: impact of CAR on teachers' personal development such as independence and confidence.	1. **Classroom practice**: the use of CAR for classroom practice was still an unimplemented plan for all teachers. 2. **Personal level**: All teachers claimed that improving their scores from Teacher Competency Test (*Ujian Kompetensi Guru*) was what they understood as their own personal development.	1. **Classroom practice**: all teachers intended to use CAR result to improve classroom practice. However, all teachers had not used CAR for their practice because mainly due to the lack of time. 2. **Personal level**: there was no impact of CAR on teachers' personal development

		3. **Interpersonal level**: three teachers claimed the usage of CAR for teachers to engage with each other in collaborative endeavour	3. **Interpersonal level**: it was hard to find participants who had use CAR to encourage collaboration with other teachers or students. The level of sharing and discussing with other teachers was also superficial.	3. **Interpersonal level**: Although most participant teachers did not collaborate, they shared and discussed teaching with their colleagues.
	Levels of Use	The levels of teachers varied from "Orientation" where teachers had started collecting information about CAR to "Refinement" level where they used CAR for their teaching practice changes. No teacher is at "No Use" level as they had the general understanding about CAR. All teachers had an intention to use the knowledge, skills and resources from the programme in the future.	All teachers had not shown signs of using CAR in the previous discussion, which implied that they were all still in "No Use" level to "Orientation" range that they had started finding information about CAR.	All teachers had not shown signs of using CAR in the previous discussion, which implied that they were all still in "No Use" level to "Orientation" range that they had started finding information about CAR. After the programme was held, all teachers upgraded their level from "No Use" of having absence in CAR involvement or implementation to "Orientation" as they have taken actions to learn more detailed information about CAR".
Influencing factors	Teacher motivation	Teachers were very motivated to attend the programme for their professional development.	Teachers were not very motivated to attend the programme for their PD because the programme was held specifically for teachers to improve their score.	Teachers were very motivated to attend the programme.
	Organisational support: 1. School leadership 2. Teacher collaboration 3. School culture	1. **School leadership**: All teachers interviewed agreed that their heads of schools encouraged the use of CAR. Not all of them explained how they were encouraged to do this in detail, but they felt that there was a supportive culture and that they had the freedom to do what they wanted.	1. **School leadership**: school leadership was problematic for all schools. What is intriguing is that even though all heads of schools claimed that they supported their teachers engaging in CAR and providing time for teachers to practice CAR, none of the teachers confirmed that those statements were true.	1. **School leadership**: All teachers interviewed agreed that their head of school encouraged the use of CAR. They felt that there was a supportive culture and that they had the freedom to do what they wanted.

		2. **Teacher collaboration**: Most teachers reported that they had shared and discussed CAR strategies and materials with their colleagues. 3. **School culture**: Teachers work under various school cultures to encourage CAR. Some schools provide more opportunity for attending PD programme than other schools, so teachers are supported by the school policy.	2. **Teacher collaboration**: Most teachers were not encouraged to share their experiences with other teachers in their schools. 3. **School culture**: Most teachers thought that their school allowed teachers to go on PD programmes, and some heads of schools encouraged teachers to attend PD programmes. All teachers did not have a problem with attending the programme.	2. **Teacher collaboration**: one interesting aspect is that teachers' views on collaboration in their school were different from one another despite working in the same school. They did not seem to work collaboratively, but just to share ideas and strategies of CAR among them. 3. **School culture**: All teachers thought that the main school policy by which they were supported were programmes in their schools and out-of-school PD programmes.

7.1 IMPACT ON TEACHER EXPERIENCE

Teacher experience as the first section of the framework is principally concerned with the impact on teachers' experiences with the PD programme from the beginning until the end. From it, the key features of the programme are identified and analysed into categories which feature aspects of the programmes evaluated. Looking at teachers' perspectives in all three case studies, the programmes possess structural and substance features where there were several characteristics of activities describing the features. Structural features refer to the characteristics of the activities' structure or design in the PD programmes, whereas substance features refer to the characteristics of the substance of the PD programme. In the conceptual framework, all features are included as core features. However, after applied to the case studies in this research, I found that these features could be further categorised into features of a programme's structure and substance. What is categorised in the structural features are active learning, collaborative participation, time management, trainer and mentor quality, and location. On the other hand, the substance features consist of content focus, coherence, and ownership. All features are discussed in the following.

7.1.1 Structural features

Structural features refer to features in the PD activities' structure or design that is part of a PD programme about CAR. They consist of active learning, collaborative participation, time management, trainer and mentor quality, and location. In regard to these structural features, the survey findings showed that teachers in all programmes were mostly satisfied with the programme. This is shown from the survey analysis that active learning and collaborative participation received a relatively high mean score. The tempo and schedule of the programmes were satisfactory and the location and facilities were convenient. The only regard teachers were not generally satisfied with was the duration of the programme; they claimed it was too short. The following paragraphs explain each structural feature at length.

Active learning: Active learning is a process that has teachers learning during a PD programme at its centre. Desimone (2011) states that teachers need to have the chance to get involved in a PD programme like giving and receiving feedback, aside from going through sit-and-listen lectures. This is not in line with Programme Version III which clearly showed that the programme did not encourage active learning because teachers only sat through and listened to the lecture. However, active learning was shown in Programme Version I and II even though they had different style in encouraging active learning to the teachers. Active learning in Programme Version II was more about understanding the concept of CAR as designed in the content materials by means of discussions, presentations, homework, and Q&As. This supports a view of Darling-Hammond et al. (2017) that instead of passively sitting through lectures, active learning suggests teachers using authentic artifacts, interactive activities, and other strategies to support deeply embedded learning. Such activities often encompass modeling and constructing opportunities for teachers to analyse and reflect on the concept they learn (Cohen & Hill, 2001). Unfortunately, active learning in Programme Version II did not provide a hands-on experience of CAR practice. Active learning has to be designed to express teachers' conceptual understandings as well as pedagogical content knowledge (Greenleaf et al., 2011). This means teachers have chances to get real experience in designing and practising new teaching strategies (Darling-Hammond et al., 2017). This is shown from active learning in

Programme Version I, which encouraged teachers to begin their own research. The method used is by having discussions among teachers in groups in overcoming their problem formulations, designing their own research, having reflection and feedback from their mentor, and presenting the result by the end of the session. Active learning suggests moving away from traditional learning models that are general and lecture-based towards models that involve teachers directly in the practice they are learning and, preferably, are connected to teachers' real-life matters and experiences.

Collaborative participation: Collaborative participation in this regard is an act of teachers' participation in a joint intellectual effort during a PD programme. Desimone (2011) argues that groups of teachers need to jointly be involved in PD activities to create an interactive learning community. This is in opposition to Programme Version III whose case study had no collaborative activities during the PD programmes even though all teachers were from the same school. By working collaboratively, teachers can create communities that give positive change to the culture and instruction of their entire grade level, department, school, and/or district (Darling-Hammond, 2017, Stoll & Louis, 2007). Godfrey et al. (2017, p.4) also support this idea that collaboration between teachers shapes the existence of effective school system as one of four "distinct but overlapping and interdependent organisational learning factors". This statement is reflected in Programme Version I and II, where teachers worked collaboratively and created communities that positively helped them in learning throughout the programme. This supports a statement of Darling-Hammond et al. (2017) that collaboration may involve a host of configurations—from one-to-one or small-group interactions to schoolwide collaboration to exchanges with other schools. It provides a broader base of understanding and support of learning that spans beyond one-to-one or small group interactions (Garet et al., 2011; Desimone et al., 2002; Penuel et al., 2007). However, teachers in Programme Version I collaborated within one-to-one mentoring groups. This is in line with a programme studied by Allen et al. (2011) and Powell et al. (2010), where teachers involved in an initial orientation training followed by a fostered relationship building between coaches and teachers. Such a collaborative approach has been discovered to be effective in promoting change (McLaughlin & Talbert, 2001; Perez et al., 2007; Buczynski & Hansen, 2010; Johnson & Fargo, 2014). Moreover, Programme Version I provided a face-to-face and online-mediated mentoring programme. This kind of programme is particularly valuable for teachers in remote schools (of which there are many across Indonesia) without easy access to support (Allen et al., 2011). Having the opportunity for a discussion with other teachers during the programme was also highly valued by teachers in Programme Version I. This shows that providing teachers with the opportunity to reflect their own teaching is a necessary strategy for teachers' development. Collaboration is needed to create positive communities that span from not only small-group interactions to schoolwide collaboration to exchanges with other professionals beyond the school.

Time management: In this regard, time management is divided into programme schedule, tempo and duration. Programme schedule refers to the daily schedule of a programme from the beginning until the end; tempo refers to the tempo of the trainer/facilitators teaching the materials; and duration refers to the number of days of the programme. Although no exact tipping point exists, research supports activities that are spread out (*e.g.* a programme with a follow-up during a semester). Based on the survey analysis, teachers were content with the time

schedule and the tempo of the respective programme. However, the main point taken from the case analyses is that teachers wished for a longer duration of the programme, so that the materials were not given hastily but in sufficient time. This is because more learning time seems to be associated with stronger impact on teachers (Darling-Hammond et al., 2009). Teachers also preferred that the programme were held on weekends rather than school days so that it did not interfere with their teaching activities. Most teachers in Programme Version II shared that it was unfortunate that the programme was held on school days as they had to find substitute teachers. It is actually common in Indonesia for teacher PD programmes, seminars, workshops, and so forth to be held on weekends or outside school days, even though they are considered as professional matters.

Literature points that teachers need sufficient time to learn, practice, implement, and reflect upon new strategies that support their teaching practice changes (Darling-Hammond et al., 2017), resulting teacher engagement in learning over weeks, months, or even academic years, rather than in short, one-off workshops (Garet et al., 2010; Dash et al., 2012; Randel et al., 2016). Nevertheless, it is unavoidable that there are still many PD programmes implementing 'one-shot' approaches instead of continuous professional learning over an extended timeframe (Kervin, 2007; Opfer & Pedder, 2011) despite having little relevance to teachers' day-to-day classroom problems (Guskey, 2000) and resulting in only a few changes being implemented (Goos et al., 2007). On the other hand, longer-term continuous PD that is evidence-based, collaborative and embedded in the context of teachers' work is acknowledged to be effective for lasting change (Pedder et al., 2008). It allows intellectual and pedagogical change (Desimone, 2009, Nudell, 2005; Kratochwill et al., 2007). However, my research showed that Programme Version II and III had no sustained duration as it was only one-off workshop.

Another common model for PD is engagement in an initial, intensive workshop, followed by implementation in the classroom and additional improvement days or coaching sessions to sustain teachers' learning (Finkelstein et al., 2010; Greenleaf et al., 2011; Polly et al., 2015; Allen et al., 2015). This can be found in Programme Version I, where teachers had a coaching session in the application of CAR into their classroom and three months later presentations helped teachers get feedback on their CAR reports. Literature shows evidence that teachers who get coaching are more likely to establish intended teaching practice (Joyce & Showers, 2002) and implement them more conveniently than those receiving more traditional PD (Neufeld & Roper, 2003). Taken together, although research has not yet established a clear threshold for the duration of effective PD models (Garet et al., 2010; Dash et al., 2012; Randel et al., 2016), it does identify that presenting PD that manifests such characteristics and results a significant professional learning cannot be accomplished in short, one-off workshops. Sustaining momentum were more likely when the initiative was getting active support from the school leadership; connected to current school developments; strategies included lesson observation and modelling teaching with developmental feedback and reflection; and the initiative gave the teachers a fuller picture of the context in which they were working (Bubb & Earley, 2008).

Trainer and mentor quality: Trainers and mentors were considered lecturers in Indonesia, having their primary responsibility to facilitate the implementation of CAR in schools. They

could be represented as the 'facilitator', facilitating teachers in constructing new practice and knowledge (Borko, 2004). However, there are slight differences between them: 1) although both trainers and mentors are experts who facilitate teachers during sessions in a PD programme, trainers teach the content materials and mentors help guide/supervise teachers' PD activities by providing feedbacks; 2) many trainers are also mentors, but not vice versa; and 3) in respect of the nature of the relationship, typically a trainer may be responsible for the entire participants and a mentor is responsible to one-to-one relationships with the mentees. In this respect, trainers' and mentors' (content) knowledge and skills are deemed to be crucial factors. For example, Choi & Morrison (2014) argue that content-knowledge experts in their field provide participants with better understandings, and Beijaard et al. (2015) highlight the importance of mentors' skill in providing feedbacks in helping primary school teachers' lack of self-regulation. Mentors need to be able to give feedbacks fit to each individual teacher, address their concerns, practice and learning characteristics (*Ibid.)*. In addition, other researchers also emphasised the importance of mentors providing specific, constructive (one-to-one) feedback (Cheng & So, 2012; Choi & Morrison, 2014). Skilled mentors are aware that PD activities driven by teachers' needs create an atmosphere where teachers feel that the mentor addresses their needs and believe that the programme provides them with the opportunity to improve their teaching practice (Vescio et al., 2008).

Unlike the other case studies, Programme Version I featured the role of mentors as an essential and unique component. The programme designated and allocated an average of one mentor to each group of ten to twenty teachers. From all six interviewees, the findings indicated that the mentors played an essential role. The implementation of the programme at the school and the impact on teachers' practice seems to be directly linked to the mentors and the role they played. During the mentoring sessions, the mentors actively facilitated the conversations by posing questions and providing information while documenting the meetings and ensuring that specific tasks or action plans were devised and completed. The purpose of the mentors was to focus on facilitating teachers through the exploration of knowledge and strategies of CAR. This finding was critical as it differentiated Programme Version I from all other case studies. Thus, although many teachers began with the best intentions, they often found it very difficult to maintain the momentum of the programme when faced with the increase in workload that CAR involved and/or lack of support.

In regard to trainer quality context, it is one of the things that keeps teachers interested and engaged with the programme and makes them encouraged to apply what they have learnt in the programme into their daily teaching practice. This quality is reflected in all trainers of the three programmes, fit to the teachers as their participants. In Programme Version I, teachers expecting to receive CAR practice were facilitated by trainers who were experts in the theory as well as practice of CAR. In Programme Version II, the trainers taught teachers to the test to help teachers get used to the variety of questions in the Teacher Competency Test and correctly answer them. At last, the trainer in Programme Version III was capable in uplifting teachers' enthusiasm towards the concept of CAR.

Location: The main point taken from the case analyses of the location was that teachers preferred the programme to be held in an accessible, conducive and easy-to-locate area. This is

in line with the findings of Nir & Bogler (2008) that satisfaction is influenced by the conditions in which a programme takes place. This is shown in Programme Version III having the location of the PD programme in a well-known university in Jakarta, in contrast to Programme Version II whose location was in a less-known private industrial area. Interestingly, my research also found that having a programme on a school site is more preferred than other locations as it also offers a warm and familiar environment, and as a result, improves teachers' satisfaction, like Programme Version III. A necessary factor in the literature is the impact of where teachers work (Kervin, 2007). Teaching and learning are contextual and making sure that PD processes require a commitment of individual professional identities, dispositions, roles and the setting in which teachers work is important to make it relevant (Hodkinson & Hodkinson, 2005; Bottery, 2006). This is why many teachers have advocated on-site PD (Bolt, 2012; Kervin, 2007). Yet, Guskey (2002) and others made a more balanced approach to PD with a combination of on-site and off-site learning. The justification behind it is because depending exclusively on site-based learning might guide to less collaboration among teachers from various contexts, lost opportunities for sharing of ideas and resources, less exposure to a broad vision for improvement, and less efficient use of outside expertise (Cordingley et al., 2015; Stoll et al., 2006).

7.1.2 Substance features

Substance features refer to the features in the content or subject matter of a PD programme about CAR. They consist of content focus, coherence, and ownership. In regard to substance features, the survey findings showed that teachers mostly agreed with the content of PD in the programme. This is shown from the survey analysis that coherence and content focus received a relatively high mean score. Teachers' expectations of the programme were fulfilled in regard to the programme aims. However, the interview results reported that teachers had their own perspectives concerning the number of features arising from these three programmes. Each feature is further explained in the following.

Content focus: The instrumental feature of a PD is content (Desimone, 2009), which discusses more on curriculum and pedagogy (Bolam et al., 2005; Kervin, 2007) or what is 'fashionable' (Carter & Wheldall, 2008). It is important that the content is relevant to teachers' needs or interests within the classroom (Bryant et al., 2001; Smith, 2005) to be committed to the practice (Goos et al., 2007). Teachers value the most PD that encourages changing approaches as a result of teachers' own self-evaluation and students' feedback as it yields the highest levels of change (Pedder et al., 2008). However, my research reported that Programme Version III was not a content-focused programme as it provided general content about CAR without specific subject matter relating to the CAR content. Content-focused PD generally carries out discipline-specific curricula such as mathematics, science, or literacy (Darling-Hammond et al., 2017). This is shown in Programme Version II, as the programme had teachers of the same area of expertise *i.e.* Indonesian Literature; and also, in Programme Version I where teachers were grouped into the same area of expertise. In line with Darling-Hammond et al. (2017), PD that focuses on teaching strategies is associated with specific curriculum content supporting teacher learning. Programme Version I and II helped teachers to learn teaching content designed for their subject matter.

Content-focused PD is most often job-embedded, meaning that it is stationed in teachers' classrooms with their own students (Doppelt et al., 2009; Greenleaf et al., 2011; Heller et al., 2012). It can offer teachers the chance to try out new methods with their students, learn a particular element of pedagogy or student learning in the content area (Antoniou & Kyriakides, 2013; Meissel et al., 2016; Polly et al., 2015). Unfortunately, this was not shown in all three programmes as they delivered externally or divorced from teachers' school or student contexts. Teachers' experience of CAR activities which directly address content and pedagogical content knowledge of their curriculum are shown to have greater impact on teachers' change in knowledge and practice. If teachers had a better understanding of the contents of their programme, it would be beneficial, as teachers who have a more developed subject knowledge tend to change their practice more easily. Their understanding helped them see the advantage of new practice, and that the effort required to change their practice was not as great.

Coherence: What teachers learn in a PD programme need be coherent or consistent with their goals, belief, knowledge and skills (Desimone, 2011; Guskey, 2003). This reflects the claim that critical professional learning strategies need to be aligned to the curriculum (Loucks-Horsley et al., 2003). Garet et al. (2001) suggest three ways to assess coherence. The first is the extent to which the PD develops teachers' previous knowledge and skills (Garet et al., 2001). Programme Version I and III were coherent with their own participants' expectations and prior understanding. Such coherence was reflected in the motivation and introduction of CAR done by the trainer to teachers in Programme Version III and in the follow-ups done by the mentors to teachers in Programme Version I. The second is that the PD affirms content and pedagogy aligned with national, state and local standards, frameworks, and assessments (Garet et al., 2001). All programmes were coherent with national frameworks as they used the same guidelines from the government in providing the programme. The last is that the PD supports teachers in developing sustained, ongoing professional communication with other teachers trying to improve their teaching in similar ways (Garet et al., 2001). This was only found in Programme Version I, where teachers had ongoing communication with the other teachers to apply the same goal *i.e.* being able to conduct CAR. This is in line with Herbert & Rainford (2014) who argue that an ongoing discussion among teachers encountering similar problems can facilitate change by encouraging the sharing of solutions as well as implementing improvement. Overall, effective PD activities seem to be related to whether teachers have a chance to reflect on their teaching, and then whether they develop a vision for a change during and after the activities. If this happens, teachers are more likely to be motivated and change their practice.

Ownership: Ownership in this regard responds to teachers' self-identified needs and interests to support individual and organisational improvements (Kedzior & Fifield, 2004). Research (King & Newmann, 2000) has suggested that PD is more meaningful when teachers implement the ownership of its content and process. In regard to the ownership in my research, all programmes successfully found participants with the same objectives as theirs. All programmes provided materials about the importance of CAR, conducting CAR, and making CAR proposal and report. This resemblance was due to the standardised guideline from the Ministry of Education regarding teacher competency in conducting CAR. However, the difference was in the CAR instructional design of each programme. The materials of Programme Version III were designed to merely introduce and motivate teachers without them being able to conduct CAR

itself. The materials of Programme Version II were designed to help pass the Teacher Competency Test. And lastly, the materials of Programme Version I were designed to guide and facilitate teachers in conducting CAR. From those three programmes, it can be seen that although all programmes designed different CAR instructional materials, teachers in each programme had the same expectations regarding the design of instructional materials from the programme they followed. As a result, teachers' expectations were met and this fulfilled teachers' satisfaction. These findings also showed that teachers' satisfaction on the instructional materials is related to teachers' tendency to shape the materials in accordance with their needs and expectations (Nir & Bogler, 2008), because PD has the purpose of encouraging teachers in giving good quality instruction for students (Opfer & Pedder, 2011). Furthermore, offering a PD programme that matches with teachers' expectation in terms of content and method of delivery (Aelterman et al., 2013; O'Sullivan & Deglau, 2006) can help overcome the challenges in the government's proposed reform (Assor et al., 2009; Deci, 2009).

Despite the above-mentioned evidence, little, if any, attention has been paid to whether teachers' satisfaction during a PD programme was associated with their prior intentions of following the programme. A study of Feinberg et al. (2005) partially mentioned this issue in a group of teachers involved in a school reform programme, having the results indicate that teachers who felt satisfied were more likely to be introduced to the proposed reform. Furtherly, it led to an impactful change towards the proposed teaching approach after two years of involvement in the programme, whereas no such change was observed in a control group (Feinberg et al., 2005). This is in line with Aelterman et al. (2016) and Hodgins & Knee (2002) who argue a PD programme that matches teachers' basic needs is more likely to change their beliefs regarding the proposed teaching strategies and teachers become acquainted to implement these strategies in their practice as well as less defensive and resisting against the proposed change. Overall, teachers develop learning through various learning activities in a programme when they find relevance between the activities and their needs.

The importance of identifying teachers' needs in learning is highlighted in the research report of Goodall et al. (2005). These authors surveyed and interviewed teachers to find out their perceptions of the effectiveness of the programme. They concluded that it was dependent on whether the programme met their individual needs. The greater teachers' willingness to follow a programme and their satisfaction with it, the more likely they gain new knowledge and skills that improve their teaching practice (Nir & Bogler, 2008). This is similar to a notion that when teachers support their students' needs, students tend to feel enthusiastic (Reeve et al., 2004).

7.2 TEACHER LEARNING

Based on conceptual framework, the impact of PD programmes on teachers learning can be seen from teachers' knowledge and skills in conducting CAR and attitudes towards CAR. In regard to teachers' knowledge and skills in conducting CAR, researchers over the years have defined stages of the process for conducting action research, and although they use different words, they possess common elements: a sense of purpose based on a problem, observation or monitoring (data collection), analysis and interpretation of information gathered, action plan, and evaluation (reflection) (Mettetal, 2012; Stringer, 2007). In addition, it is also crucial for

teachers to have a sense of belief in CAR and confidence in their attitudes towards CAR. These shared elements were explored in the following discussions.

7.2.1 Knowledge and skills in conducting CAR

The impact of PD programmes about CAR on teachers learning can be seen from teachers' knowledge and skills in conducting CAR. Such knowledge and skills are divided into stages in CAR cycle, and accordingly, the impact can be reflected in how much teachers have the expertise at each stage. The stages discussed in this section are problem formulation, data collection, analysing and interpreting data, and taking action and reflection. Below are the stages explained at length.

Formulating problem: The first discussion of the impact on teachers' knowledge and skills is about problem formulation. According to Fraenkel and Wallen (2003), addressing and narrowing a problem require teachers to remember that the goal was to make things better, improve some specific practice, or correct something that is not working as well as it needed to be. The finding result showed that teachers from all programmes knew this definition and use of problem formulation. Most teachers said that they wanted to improve or correct their teaching practice by conducting CAR. However, taking it further, in the formulation it is also necessary to keep it manageable by taking into consideration things such as time requirements (or restrictions), data collection and analysis skill levels of the individual(s) conducting the research, and any budgetary limitations (Fraenkel & Wallen, 2003). This is however not shown from most teachers on Programme Version II and III as they had not really made the first step in this problem-formulating. Meanwhile in Programme Version I, teachers already took consideration of the above-mentioned factors. An example of time requirement is that a teacher said he planned to finish his CAR project in three months and another in six months. For data collection and analysis skill level, an example is a teacher shared that she only wanted to analyse student assessment results as a starting point, while another had taken further steps by using not only student assessment results, but also student interviews and portfolios as she wanted to keep track of the changes. This general idea of teachers keeping track of data may help answer the problems which cause many schools to collect a lot of data without properly using it for problem-solving that further leads to information overload and a waste of time (Lai & Schildkamp, 2013). Taken together, what teachers require to learn on data formulation is the ability to: 1) address and narrow a problem; and 2) keep it manageable by taking into consideration things such as time requirements (or restrictions), data collection and analysis skill levels of the individual(s) conducting the research, and any budgetary limitations.

Collecting data: The next discussion is data collection, which means knowing how to find relevant data and use it effectively (Protheroe, 2001). Most teachers on all programmes had grasped this general concept. According to Lai & Schildkamp (2013), once a clear purpose is found in the problem formulation stage, it is easier to know how data need to be collected from possible data sources. This is why teachers from Programme Version II and III had yet shown the ability to collect data as they had not begun their problem formulation, unlike teachers in Programme Version I who had already shown several of their data collection techniques. Fraenkel and Wallen (2003) suggest three data collection techniques. First, teachers can observe

participants (*e.g.* students, other teachers, parents, and administrators) involved in the educational process. Whenever observations are made, it is advised to record what is observed as much as possible. This is reflected in a teacher from Programme Version I who used a journal to record her classroom observation on daily basis. Second, interviews may also be used to collect data from students or other individuals. Interviews can be done both by an oral question-and-answer exchange between two or more individuals and a written form through the use of a pencil-and-paper medium also known as a questionnaire or survey. This is reflected in a teacher from Programme Version I who shared his technique by having interviews with students and their parents to understand and improve their motivation. The third data collection technique involves the examination and analysis of existing documents or records *e.g.* attendance records, minutes of faculty meetings, school newspapers, lesson plans, policy manuals, seating charts, and student portfolios. This is the most common technique used by teachers from Programme Version I where many of them mentioned these documents as their data. This examination and analysis are usually the least time-consuming since the data have already been collected; it is the job of teachers to make some sense of what is already there. From the three techniques, Fraenkel and Wallen (2003) suggested that it was better to use multiple techniques in collecting data. This allows teachers to relate or integrate two or more sources of data to build their quality and accuracy. Many teachers had used multiple techniques such as the combination of interview and student assessment result and observation journal and students' portfolios. Taken together, what teachers require to learn on data collection is the ability to: 1) observe participants involved in the educational process; 2) use interviews to collect data from students or other individuals; and 3) examine and analyse existing documents or records.

Analysing and interpreting data: This is the stage of the analysis process when teachers begin to make connections between the acquired data and the addressed problem. Analysing data constitutes contextualising, categorising, calculating, connecting, and/or summarising data in a way that meets the purpose in answering the problem (Lai & Schildkamp, 2013). Findings showed that most teachers of all programmes had understood the idea of analysing and interpreting data. However, since teachers from Programme Version II and III had not yet started their CAR project, they had not shown this skill yet. Meanwhile, teachers from Programme Version I had shown some techniques. The first technique is from Johnson (2008, p.13) who suggests that "*as you collect your data, analyse them by looking for themes, categories, or patterns that emerge. This analysis will influence further data collection (and analysis) by helping teachers to know what to look for*", which can be done by identifying and organising the data into important patterns and themes to construct some sort of framework for presenting the key findings of CAR. This was seen from several teachers in Programme Version I who created a rubric based on learning indicators to notice the change on student performance based on these indicators. Another had performed and analysed interviews based on a coding theme in helping him to look for factors that influenced students' motivation. The next technique is from Schwalbach (2003) who argues that it is also important to look for contradicting or conflicting information in the data with the patterns or trends that have emerged. A teacher showed this technique by analysing students' interests using a comparison of several teaching methods known as *Smart Gym*. The most common technique used by teachers in Programme Version I is comparing pre-test and post-test of student assessment result. In this step, teachers examine the meaning of data for similarities, contradictions, and their implication. The key is to look for aspects of the data that answer the problem, provide

challenges to current or future practice, or may guide future practice (Parsons & Brown, 2002). Taken together, what teachers require to learn on data analysis and interpretation is the ability to: 1) identify and organise the data into important patterns and themes to construct some sort of framework for presenting the key findings of CAR; and 2) look for similar or contradicting information in the data with the patterns or trends that have emerged and its implications.

Taking action and reflection: The last knowledge and skill needed is taking action and reflection. Once the interpretation result is clear, teachers can take proper action to overcome the initial problem they have (Lai & Schildkamp, 2013). From the findings, unlike teachers from Programme Version II and III who merely grasped this idea of action-taking and reflection, teachers in Programme Version I had already implemented different kinds of action and reflected such action taken. Because CAR is largely about introspectively examining teachers' own practice, reflection can be done by critically exploring the action taken from the previous step, the reason such action is taken, and its effects. Besides, reflection is also about taking the time to critically re-examine exactly who is involved in the process, what leads teachers to reflect this aspect of their practice, why they decide to do what they do, where the suitable place is (*e.g.* time, sequence, location) to implement future changes, and how this impacts their teaching practice (McMillan, 2012). For example, teachers from Programme Version I reflected on their one-cycle CAR project before entering the next cycle. After reflection, according to Johnson (2008), teachers need to make an action plan consisting of brief statements or simple descriptions about the implementation of a new educational practice, a plan to reflect on alternative approaches to identify the problem, a plan to share what teachers have learnt with others interested in the topic (*e.g.* other teachers, administrators, boards of education, or other schools or districts), or any other "next steps" teachers may take. Fraenkel and Wallen (2003) argued that the fundamental aspect of developing an action plan is that teachers now had some sort of strategy for trying out, carrying out, or otherwise putting into practice the changes resulting from the findings of CAR. For example, teachers from Programme Version I developed different kinds of action plan based on their own reflection. One teacher said, "*My action plan is trying different teaching methods with the same students*" while another tried the same teaching method with different students. Fraenkel & Wallen (2003) added that as the action plan was exercised, its effectiveness must continually be supervised, evaluated, and revised, thus perpetuating the cyclical nature of CAR. According to Metler (2016), it is fundamental for teachers to reflect on and critically examine their teaching practice continuously during the process of teaching or throughout the entire CAR process so that the progress is continuously monitored. By doing this, teachers are not confined to decisions made at the outset of a project; they can adapt their procedures if the situation warrants. This is also shown in teachers from Programme Version I who had done repeated cycles in their CAR project. Most teachers did the cycle two to three times to refine their previous method, while another did 35 times of different cycle until he found the right cycle for his students. Taken together, what teachers require to learn on taking action and reflection is the ability to: 1) how teachers reflect their previous step; 2) what teachers put into their action plan; and 3) how teachers overcome the problem by using the repeated cycle.

7.2.2 Attitudes towards CAR

The impact of PD programmes about CAR on teachers' learning aside from knowledge and skill aspect can also be seen from teachers' attitudes towards CAR. Teachers' attitudes are strong predictors of implementation and ultimate success of a PD programme (Lumpe & Chambers, 2001). The attitudes discussed in this section consist of teachers' belief in CAR and confidence in themselves, whose discussions are explained at length in the following.

Belief in CAR: What attracts teachers to CAR is their belief that it may improve their knowledge and skills, develop to their growth, and increase their effectiveness with students. PD programmes incapable of mentioning these needs are unlikely to succeed (Guskey, 2002). Researchers have identified attitudes required by teachers in conducting CAR, which was concluded in conceptual framework into teachers' beliefs and teachers' confidence. The survey finding showed that teachers of all programmes believed CAR to be important. This is shown from the survey analysis that teachers' beliefs received a relatively high mean score of all three programmes. Meanwhile regarding teachers' confidence, the survey finding showed that only Programme Version I received a relatively high mean score, meaning teachers were more confident in conducting CAR, compared to teachers from Programme Version II and III. However, the case study results show that teachers had their own perspectives concerning the impact of the programme on their attitudes towards CAR.

PD activities are frequently designed to encourage change in teachers' attitudes, beliefs, and perceptions. Programme providers, for example, often attempt to change teachers' beliefs about certain aspects of teaching or the desirability of a particular curriculum or instructional innovation, assuming that it may further lead to changes in their classroom and practice and in turn may result in having students' learning improved (Guskey, 2002). This statement is reflected in all programmes, as in Programme Version III, teachers believed that CAR could help to solve their classroom problems. This is why they had intended to start to conduct CAR as a one-cycle experiment to overcome a particular classroom problem. In Programme Version II, teachers believed that CAR was important for their career promotion. Consequently, they conducted CAR to produce CAR reports to be used as the requirement of teachers' promotion to the government. PD programmes based on the assumption that change in attitudes and beliefs comes first are typically designed to gain acceptance, commitment, and enthusiasm from teachers and school before the implementation of new practice or strategies (Guskey, 2002). However, teachers from Programme Version I believed that not only could CAR solve their teaching problems, it could also benefit their personal development. Consequently, they conducted CAR continuously as a repeated cycle to correct or improve their teaching practice from the previous cycle. This is an important factor that many PD programmes fail to consider is the process of teacher change. Change in teachers' attitudes and beliefs happens primarily after they obtain evidence of improvements in student learning. These improvements typically result from changes teachers have made in their classroom practice, new instructional approach, the use of new materials or curricula, or simply a modification in teaching procedures or classroom format (Guskey, 2002).

Teachers' beliefs generally cover belief in CAR as a way to help improve teachers' practice and specifically cover belief in data (buy-in belief) as a major part of CAR itself (Kerr et al., 2006). Teachers also need to gain the importance of data as a major part of CAR itself. This buy-in belief was shown in teachers from Programme Version I, as they were aware that their limited memories made them believe in the importance of data to help remember the mistakes they had made. When teachers believe that data is important to drive their teaching practice, the use of data can be promoted (Schildkamp, 2007; Wohlstetter et al., 2008). In contrast, when they do not believe in data and think that "experience is enough", then use of data in schools can be greatly hampered (Ingram et al., 2004). Conclusively, what teachers need to gain is to believe the importance of CAR itself, not only for career promotion or solving a classroom problem, but also for their personal development.

Confidence - In a study of teachers' change through CAR, Bleicher (2014) found that teachers involved in CAR reported an increase in their beliefs regarding student abilities and an increase in expectations; and they were empowered through knowledge and valued self-efficacy. This is shown only in teachers from Programme Version I, as they were confident about their own capability in conducting CAR. Meanwhile, teachers from Programme Version II and III felt otherwise. This is due to teachers having an increased sense of autonomy (perceived ownership) to their CAR project. Kerr et al. (2006) argue that autonomy may motivate teachers to examine their weaknesses and strengths, and develop solutions for future actions and, therefore, make them have a better chance to improve their practice. This is seen in teachers from Programme Version I where they conducted CAR as a repeated cycle to have a better chance of improving their teaching practice. This experience tends to yield teacher ownership of practice (Kervin, 2007), considering that ownership is an outcome of change, not a condition of change (Fullan et al., 2005). Nevertheless, it is fundamental for the experience matches teachers' own 'levels of skill, motivation, and prior knowledge' (Kervin, 2007, p.51) or 'zone of proximal development' (Vygotsky, 1978, p.86) to reassure teachers that they have the competence and capacity for the practice (Priestley et al., 2013), ergo building their confidence, efficacy and morale necessary for their engagement with new initiatives (Bubb & Earley, 2007). On the other hand, teachers lack autonomy when their students fail tend to find external factors to blame, such as difficult tests, rather than themselves (Bandura, 1977). These teachers are less likely to improve their practice and hence more difficult to conduct CAR. This is reflected in teachers from Programme Version III where they finger-pointed their lacking time to conduct CAR or teachers from Programme Version II where they blamed the government for making CAR as a requirement thus putting pressure on them. Teachers appreciate PD that involves problem-solving (Lawler & King, 2000), active learning, and experimenting with classroom practice (Opfer & Pedder, 2011) to help their students to learn.

7.3 CHANGES IN TEACHING PRACTICE

Changes in teaching practice is the final outcome in evaluating the impact of a PD programme about CAR on teachers. It discusses whether there are any improvements in using the knowledge and skills and attitudes acquired from the programme (Guskey, 2002). Teacher PD encourages changes at various levels: skills and knowledge, practice and behaviours, beliefs, and attitudes (Evans, 2011), all of which presumably impact on how and what teachers learn

from PD experiences. At an affective level, teacher change may not only improve confidence and self-efficacy, but also enthusiasm for collaborative working, stronger commitment to changing practice and openness to try new things (Cordingley et al., 2005).

Changes of teaching practice in terms of CAR usage as a new process concentrate on the usage of CAR itself. In order to analyse the changes, a distinction of impact levels on teachers in this study follows Frost and Durrant's (2003) usage of CAR *i.e.* in classroom practice, at personal level, and at interpersonal level. Hall & Hord's (2011) Level of Use is then applied to these changes as a behavioural indicator tool in assessing teachers' CAR implementation. The discussion of each usage as well as the Level of Use is presented below.

7.3.1 Changes in classroom practice

Changes in classroom practice is the most difficult, but the most essential part of teacher development for students' learning. Practice with proper skills and contents, as Shulman & Shulman (2009, p.263) emphasises, is 'the heart of teaching'. It consists of changes in contents and strategies of teaching, so it requires understanding the subject matter and how to transform their understanding into suitable teaching strategies. Usages of CAR on classroom practice concern on the adoption of teachers' new practice or improvements. Mertler & Charles (2011) describe them by providing a few categories of CAR usage in classroom practice. Such categories are: creating instructional materials, managing classroom management, and creating instructional methods. This is shown from several teachers in Programme Version I using CAR to create instructional materials and methods until the solution could be sought and found. CAR helped them carry out a wider range of practical activities in the classroom. There were two main examples. The first is the use of the same method in different classroom situations until the result seemed to reassure teachers and confirm the best classroom situation for the method. The second is the use of different methods in the same classroom situation until the solution could be sought and found and became the preferable method. Beside the extensive kinds of usage in classroom practice from Metler & Charles (2011), there is also another usage: to help teachers in measuring improvements in student learning or motivations by using data to determine the effects of their CAR plan (Mills, 2007). A reflection on this can be seen from a teacher in Programme Version I who investigated students' motivation and used several instruments to produce data for his research. In addition, the interview data show that an effective way to encourage teachers' change in practice is sharing their learning with their colleagues, which is an important feature of a professional learning community advocated by many scholars (Fullan, 2002; Hoban, 2004; Huffman & Kalnin, 2003; Shulman & Shulman, 2009). Sharing new practice facilitates teachers' reflection on it and could lead to change in practice. However, it is also found that some teachers thought that the best way to learn was actual teaching experience, but they did not have any chance to practise in the classroom. Therefore, the impact of sharing might not last long enough, unless they used their learning in the classroom. Taken together, usages of CAR on classroom practice concern with the adoption of teachers' new practice: 1) creating instructional methods or materials; and 2) measuring improvements in student learning or motivation.

7.3.2 Changes at personal level

The next usage of CAR is changes at personal level, which concerns on CAR usage to increase their own professional development and knowledge. CAR usage for personal development is that CAR as a systematic reflection can make teachers become more reflective to their teaching practice and more aware of the importance of student involvement in the classroom that it provides teachers with the stimulus for changing and improving practice in order to make it appropriate for students and people whom teachers work with (McMillan, 2012; Trent, 2003; Parsons & Brown, 2002). This is shown from several teachers in Programme Version I who had done more than one cycle one CAR to refine their teaching methods. Aside from becoming more reflective, teachers' efficacy was increased that they felt more confident as a teaching practitioner. For example, all teachers in Programme Version I felt more confident and believed in themselves after conducting CAR. Commonly, change in practice begins with student learning, followed by attitudes and ends with beliefs. The reason behind is that it is an experience that build teachers' attitudes and beliefs, not the other way around (Guskey, 2005). Unfortunately, there is a possibility that teachers may not extend such practice (Webb, 2007). There is little evidence of teacher change in beliefs and values (Gleeson & O'Donnabháin, 2009; Opfer & Pedder, 2011). Change is a reciprocal interplay between changes in beliefs, practice and students with no definitive starting place; it is not a linear process (Opfer & Pedder, 2011). This cyclical view of change is developed by Opfer & Pedder (2011), who argued that teachers' beliefs and values might often be greater than their practice, caused by the influence of organisational conditions and individual teacher characteristics in this process. Beside for personal development, the usage of CAR is for teachers' knowledge or their own professional growth. According to Johnson (2008), CAR allows for a meaningful approach to professional growth and asserts the professionalism of teaching by giving teachers the control in their own PD as opposed to being told by someone else that a specific goal or topic is what is needed by a teacher. For example, one teacher in Programme Version I kept updating the quality of his own research. CAR successfully gave him new insights to improve the research. It allows him for a much more meaningful approach to his own PD. Further evidence of the PD multiplier on teachers' change in beliefs and values was in their reporting of being more likely to changes and other collaborative practice (Cordingley et al., 2005). This is rather notable given that teachers' openness and willingness towards the new practice and change was addressed by many teachers as being highly necessary in engaging with and continuing this PD initiative, and also focuses on the call in the literature for PD practice to be personalised (Bubb & Earley, 2008) with a move away from teachers delivering externally driven goals all the time (O'Sullivan, 2011). Taken together, usages of CAR for personal level concern on CAR usage to increase teachers' knowledge and personal development by: 1) providing teachers with the stimulus for changing and improving practice; 2) increasing teachers' confidence as a teaching practitioner; and 3) giving teachers the control in their own PD.

7.3.3 Changes for interpersonal level

The interpersonal level concerns on the usage of CAR for teachers to engage with each other in collaborative endeavour. Beliefs and values seemingly change when teachers work together on new initiatives in a process known as additive change, which is cultural change – even though

it is unintentional (King, 2014). Similarly, Fallon & Barnett's (2009) develop a concept of a generative authentic learning community. This collaborative culture potentially leads to other beneficiaries (Stevenson, 2008). For instance, the impact of PD could ripple to other teachers who were previously not involved in the original PD intervention, which in turn could also lead to improved outcomes for other students, a process known as 'cascading' (Bubb & Earley, 2004, p.84) or described by Stevenson (2008) as the 'ripple effects' of PD. This common usage of CAR for cascading can be seen from teachers in Programme Version I. Teachers claimed the usage of CAR for teachers to engage with each other in collaborative endeavour. What is significant here is that collaborative practice formed part of the process by which teachers engaged with CAR and yet these same collaborative practices have led to other forms of collaborative practice which were not part of the motivating factors for teachers to initially engage with the PD initiative. It can also develop their own intrinsic motivation and yield a sense of purpose and independence (Herbert & Rainford, 2014).

Collaboration helps teachers find their own meanings by critically engaging with research evidence and reflecting that allows them to take risks, gain new perspectives and change their practice (Procter, 2015). Atay (2008) states that it is composed of teachers working together in empowering relationships to bring together different perspectives, ideas, experiences, and resources in improving their own practice. Beside improvements in the relationship with colleagues, CAR is a powerful tool that can transform teachers' relationships with their students. It allows teachers to gain more insights into their students' needs and perspectives (Sagor, 2000). Rogers et al. (2007) argue that by putting students in the centre of teachers' pedagogical decisions, teachers establish a more personal relationship with their students, develop a better understanding of who their students are as a learner, and give students a voice in the classroom. This is shown from one teacher in Programme Version I who investigated students' motivation and developed a better understanding of who their students were. Taken together, usages of CAR on interpersonal level concern on the usage of CAR for teachers to engage with others: 1) teachers' relationships with each other; 2) teachers' relationships with their students.

7.3.4 Levels of use

As a cause-and-effect, changes in teaching practice cannot be separated with the outcomes of such changes. Relatably, the outcomes from conducting CAR are commonly viewed in two ways: either the teacher uses the teaching practice improvements or not (Muijs & Lindsay, 2008). Muijs & Lindsay (2008) claim that such degree and quality are measured in terms of the number of teachers going through different phases of implementation of their learning, and accordingly, such phases are important to be taken into account. Some researchers support the idea of using such degree and quality as a measure of the sustainability of practice (Baker et al., 2004; Bolam et al., 2005; King, 2014).

A framework which outlines Levels of Use (LoU) of implementation was provided by Hall & Hord (2011) to evaluate teaching outcomes and measure its degree and quality. According to Guskey (2000), the best PD programme included an explicit examination of behavioural indicators of LoU as part of the learning experience, which might help teachers document not only frequency of use, but also, in many instances, the appropriateness of use within specific

contexts. This study examines behavioural indicators of LoU of CAR implementation from teachers' own perception or self report, vary a range of non-use to the highest level of use.

Table 34. Levels of Use (Hall & Hord, 2011, p.7)

Level of Use	Behavioural indicators
Non-use	Absence of CAR implementation or involvement
Orientation	Actions taken to learn more detailed information about CAR
Preparation	Decision and preparation made for first use of CAR
Mechanical use	Teacher primarily clings to the user guide from the programme to use CAR
Routine	Established use of CAR Little thought about improving CAR use without making any changes to it
Refinement	Changes made to the use of CAR to increase the impact on teaching practice
Integration	Commitment to use the innovation with other teachers to provide a collective change
Renewal	New developments are made in conducting CAR to improve the impact on students

Those at the highest level are individuals properly applying the new knowledge and skills and actively seeking more effective alternatives to established patterns of use, which can be seen from teachers in Programme Version I. One teacher is considered in the Routine level, having established a regular pattern of use but making few, if any, changes. Few teachers mentioned that they would incorporate practice and suggestions acquired from their CAR results into their own new curriculum. Those are in the Refinement level as they made changes to the use as a way of making improvements. A teacher in the Integration level was described as an individual making deliberate efforts to coordinate with others and also engaged in how to teach practice. Finally, there was a teacher in the Renewal level, that she actively sought more effective alternatives to established patterns of use as she expressed strong will to change her practice in the following year using what she had learnt from CAR. Teachers determined to engage with and sustain practice relevant to their students' needs, thus producing in the highest levels of change (Pedder et al., 2008). In the other hand, Non-use as the lowest level describes individuals taking no action whatsoever with respect to the new knowledge or skills, such as teachers in Programme Version II and III. In both cases, the crucial factor which hindered all the efforts to improve teachers' practice was the lack of time due to the heavy workloads. The lack of time not only limited the PD impacts in the short term, but also hindered teacher development in the long run, by preventing the teachers from sharing and collaborating with their colleagues. Most participants of these case studies were having a heavy workload during the school terms. This leads us to Eraut's (2007) finding that professionals' learning considerably depends on the quality of workplace culture and support. He claims that the available time plays a decisive role in their workplace learning, this is because learning and acting in a new way requires more time, whereas their time is limited. The similar tendency is found in all three case studies. The lack of time affected almost every aspect of possible impacts of the programmes. Teachers reported that it prevented them from reflecting on: their new learning and follow-up studying, doing the programme's tasks and discussing their teaching approaches. Without finding enough time to reflect on what they have learnt, practiced and discussed with other teachers, teachers may only change limited aspects of their teaching, and they are likely to keep their existing way of teaching. This research confirms that change in practice is complex. There are common obstacles which make efforts for teachers' PD difficult, such as: lack of a supportive school culture and funding, poor school facilities, lack of teaching opportunity and lack of teachers'

commitment to their PD. Amongst these, this research finds that the lack of time and the lack of supportive school culture are the most common and critical factors which seemed to affect teachers' PD the most.

7.4 INFLUENCING FACTORS

In this study, there are factors that influence the impact of a PD programme about CAR on teachers: teacher characteristics as the internal factor and school characteristics and government policy as the external factors that regulate how interventions are implemented and explain why similar intervention activities have diverse outcomes across different individuals and schools. Each factor is discussed at length in the following.

7.4.1 Teacher characteristics

In this section, teacher characteristics discuss teachers' motivation in following a PD programme about CAR and teachers' background and professional circumstances. This study shows the implications of having teachers as participants in a PD programme about CAR with different reasons for participating. Although all case studies were designed for learning about CAR, Programme Version I was followed by a more heterogeneous group of teachers than the others. Programme Version III was followed by teachers from the same school and Programme Version II invited teachers teaching the same subject (*i.e.* Literature). In contrast, all teachers in Programme Version I came from different schools and subject backgrounds.

Teacher motivation: What motivates teachers to attend a PD programme is an important issue of teachers' PD. Shulman & Shulman (2009) point out the importance of teachers' motivation in professional learning, because a teacher can develop new learning of a particular teaching strategy and understand it, but it cannot be used for the benefit of teaching if the teacher is not motivated to change. As a consequence, it is necessary to understand the factors which affect teachers' motivation. Teachers' motivation is often brought up as it has direct effect positively and considerably to their satisfaction (Arifin, 2015). In Programme Version III, teachers' motivation was simply to know what CAR was. In Programme Version II, the motivation was more to improve teachers' test scores than to learn about CAR. Meanwhile in Programme Version I, teachers not only wanted to learn, but they also wanted to conduct CAR into their teaching practice. From all three programmes, it can be seen that although each programme offered different objectives, teachers had the same objectives on their respective programme, and, as a result, such objectives were met and fulfilled their satisfaction.

Based on the case study analysis, there are two kinds of reason for undertaking the CAR programmes. Firstly, teachers' motivation comes from external influences, such as the head of school and the government. This can be seen from Programme Version II, where teachers were invited by the government as an obligation to improve their Teaching Competency Score. This extrinsic influence was found to be effective in influencing teachers' enrollment in a programme (Zhang et al., 2008). A teacher who is predominantly and extrinsically motivated is driven by finding the easiest way to finish a task (Majeric et al., 2011). However, Nir &

Bogler's (2008) findings suggest that teachers' satisfaction is likely reduced when a programme is designed to fulfill procedural requirements set by the government rather than to tailor teachers' actual needs. The second kind of motivation is that teachers have their own internal motivation in following a programme. It can be seen from Programme Version I as teachers attended the programme voluntarily for their own personal and professional development. According to Nir & Bogler (2008), when teachers are able to decide for themselves whether to follow a programme or not, teachers are more likely to manifest a higher degree of satisfaction with it. Actual changes tend to happen to the extent that teachers are self-endorsed, which constitute the key and value of the proposed alternative approach for their teaching practice (Deci & Ryan, 2000). Furthermore, Zhang et al. (2008) reveal that teachers are intrinsically motivated to enroll in a programme to accomplish their evolving learning inquiry in terms of wanting to continue to explore and work on their self-selected topics and to further strengthen teachers' commitment to the PD activities. McMillan et al. (2016) also find that teachers' personal interest in PD and the need to improve practice are among the main motivating factors. In the context of my study, the participants in my research had various concerns about their teaching, including understanding of CAR, conducting various practical work, and how to introduce the result in the classroom. They were motivated to learn when they wanted to improve their understanding of the subject knowledge and skills, and to get information about exciting practical work which would foster their students' learning and participation.

Teacher background and professional circumstances: It was found in all case studies that a teacher's background and professional circumstances impacted on their learning by determining their learning needs and their expectations of the programme. Teachers' personal and professional situation as a critical condition for their development has been emphasised by scholars (Fullan, 2002; Hoban, 2004). In all three case studies, teaching experience and qualification played an important role in what teachers thought were needed for their CAR learning. For example, concerns about the knowledge and importance of CAR were related to the prime need of less experience in teaching. However, more experienced teachers were more concerned with the practical activities and their active involvement in the classroom activities, although these were also the concerns of teachers who had less experience and less developed knowledge. The impact of the PD programme on teachers' motivation seemed to depend on whether they developed a need from the contents of the programme. For example, if teachers experienced interesting practical activities during the programme and relevant to their teaching, their motivation increased, and they were motivated to learn and change. However, if they thought a particular aspect of the programme was irrelevant to their practice, they tended to be less motivated to learn from it.

The analysis of the three case studies in this thesis revealed that teachers' knowledge acquisition depended on various learning conditions, having two of them are teachers' background and their prior knowledge. When they tried to understand new knowledge, they also tried to link it to their understanding of new learning dependent on their prior knowledge based on their backgrounds. This study revealed that developing teachers' understanding of CAR methods was not easy. In particular, teachers who had less developed knowledge found it difficult to fully understand the contents and/or CAR strategies. Arzi & White (2008) also point out such difficulty in their longitudinal study about change in teachers' subject knowledge, that most teachers' detailed subject content knowledge is acquired until university graduation, and the

weakness of subject knowledge of non-specialists is difficult to overcome by 'on-the-job textbook learning', because of the interdependency of knowledge and interests. However, this study also found some positive impacts of the PD programmes about CAR on improving teachers' understanding of certain concepts. In particular, the problem formulation learning was regarded as an effective way of understanding theory and pedagogical content knowledge at the same time, because the teachers could see their misconceptions through the examples or models and also learnt how to understand the concept in more comprehensive ways. The opportunity to try out experiments and discuss them with other teachers during the programme was another useful way to improve understanding of both theory and skills.

7.4.2 School characteristics

Teacher PD is unlikely to have long-term effect in the absence of organisational support (Muijs & Lindsay, 2008), as it impacts on teacher motivation and the sustainability of change (Guskey, 2000). From the case analysis, it showed that there was a gap among schools whose teachers followed the three programmes regarding school leadership, collaboration, and school culture. These factors are all tied together in promoting teachers in using CAR for their teaching practice and school development purpose. According to Cordingley et al. (2015), the degree of support differs but is present in some form in most programmes associated with teachers' making impactful changes to their teaching practice. It ranged from understanding the precise nature of expected changes to practice and creating organisational conditions for these to occur. It is the moderating factor of a PD programme, which identifies of how the school promotes or hinders teachers using their new learning into their practice after following a programme. It is an important part of an evaluation since it may impact upon motivation and sustainability of change (Guskey, 2000). A study from Rahman (2016) in Indonesia has attempted to characterise certain school conditions that help improve teachers' professional learning and development, including the need to go beyond personal talk and relationships to professional conversation in teachers' interaction and communication; a certain degree of collegiality and collaboration is required to enable not only access but also participation in PD and the importance of head of school leadership roles.

In this section, school characteristics discuss school leadership, teacher collaboration, and school culture. The discussions are presented below.

School leadership: Teacher PD 'does not just happen – it has to be managed and led' (Bubb & Earley, 2004, p.80) or led and supported. Bass & Riggio (2006) claim that transformational leadership is the most successful method of achieving long-lasting change due to striving on winning teachers' 'hearts and minds', cultural change and allowing space for improvement. Accordingly, a supportive school culture on teacher PD depends on the leadership of the head of school. For example, the heads of schools whose teachers followed Programme Version I had a more encouraging and better role model for teachers in conducting CAR rather than what were modelled by heads of schools of teachers in Programme Version II and III.

Study findings revealed three characteristics of supportive heads of schools. The first characteristic is an open-minded attitude towards any new initiatives including CAR project.

Heads of schools get to make organisational capacity: believing in teachers by providing PD and on-going support and in schools as learning organisations, both of which are important to the change process (Fullan, 2002). What is impressive about heads of schools making organisational capacity for change is that they did so and did not micromanage this initiative where they invested their time, timetabling and resources (King, 2011). The teachers' interview data shows that some heads of schools encouraged teacher development by showing more progressive attitudes to teaching and learning than others. There were also some who seemed to be more supportive. The second characteristic identified is coaching leadership that heads of schools not only listen to their teachers' problems, but also encourage them in conducting CAR. This is in line with what Priestley et al. (2013) describe at secondary level as 'facilitative leadership (trust, democratic structures, autonomy, innovation, risk taking)' involving teachers' engagement with change. The last characteristic is progressive leadership. A progressive head of school encourages teachers to learn and try new ways of CAR and also provides effective school structure and policy to improve CAR implementation. Accordingly, the most successful heads of schools are those able to initially lead teachers towards a new initiative and create more distributed leadership around it (Copland, 2003; Wayman & Stringfield, 2006). These findings were confirmed by previous studies which suggested the significance of effective leadership in schools, hence the good heads of schools might enhance the practice in schools (Kerr, et al., 2006; Wohlstetter et al., 2008). Leadership is also the key in promoting collaborative practice among teachers based on trust and respect (Lugg & Boyd, 1993; Leonard & Leonard, 2003; Bottery, 2006), where all teachers are equally ranked and input is highly respected (King, 2011). Collaboration begins with 'exchange and coordination' and move along a continuum to 'more complex professional collaboration' based on sharing feedback on practice and improvements (Gilleece et al., 2009; Conway et al., 2011). Unfortunately, this characteristic is lacked by all heads of schools whose teachers followed the programmes.

Teacher collaboration: Support plays an important role in creating collaborative practice (O'Sullivan, 2011). Case studies from Bolam et al. (2005) in the UK show that teachers are required to sincerely trust others, and this trust may help as collaborative practice developed. Furthermore, findings from Cordingley et al. (2005) of collaborative PD from across the world suggest the importance of giving non-contact time to encourage collaborative planning for continuous teacher development. It is also important to give teachers time to reflect and consolidate learning (Neil and Morgan, 2003; Stevenson, 2008; King, 2011). For example, teachers in Programme Version I appeared to be more collaborative than teachers in Programme II and III as the workshop session was filled with discussions among teachers about their CAR projects. This is in contrast with teachers in Programme Version III who only sit through the lecture during the session. This might be related to the adequate time for teachers in working together to analyse and discuss data in schools. In fact, case studies showed the relationship between research and collaboration is a reciprocal one: research initiatives are more likely to be successful if teachers are let to learn and work collaboratively, and the use of data helps foster constructive collaboration (Feldman & Tung, 2001; Symonds, 2003). From the findings, teacher collaboration and the degree of sharing and discussing happened in two ways, through formal and informal meetings. The formal meetings of sharing and discussion were more likely to happen when there was a supportive school policy and culture. On the other hand, informal meetings between teachers seemed to facilitate collaboration between teachers the most, but the frequency and quality of the meetings seemed to depend on type of person and school culture.

Collaborative cultures facilitate system for dissemination of findings by creating space for teachers to encourage others to try the practice (Goos et al., 2007). Unfortunately, collaborative cultures alone do not trigger change; they have to assert on knowledge of curriculum, assessment and student learning (Sparks, 2003), which potentially build and consolidate collaborative practice and build the way for future collaborative practice. In this way, collaboration may be considered as an effect of PD and lead to be an impact of PD (King, 2011).

School culture: In this study, another critical condition for teachers' PD is a supportive school culture. School culture constitutes a set of core beliefs and assumptions, attitudes or the way things are done in a school (Evans, 2008) as it establishes how schools operate (Evans, 2008). It is commonly composed by heads of schools' actions or words and can also be set by teachers that it can significantly change as the teachers change (Webb, 2007).

From the study findings, two important issues on how to make a supportive school environment in school culture context emerged. First, school culture often determines teachers' opportunities to PD. It allows teachers to attend out of school CAR programmes. As presented in the previous chapters, the schools where the teachers worked in provided different learning opportunities, such as funding out-of-school PD opportunities and encouraging alternative types of PD activities in school. Some schools gave teachers more opportunities for engaging in various leaning activities, through which the teachers could develop new scenarios for particular classroom activities. Goodall et al. (2005) find that teachers' PD opportunity is considerably dependent on their schools and identified time and cost as the main barriers to effective learning provision. Additionally, there is a problem of 'fitting in' an extra, time-consuming activity associated with reading and engaging in CAR as well as a set of particular skills, language and ways of working with research (Mitton-Kükner, 2016).

Another possible reason for different opportunities among schools is school leadership. The teachers' interview data shows that some heads of schools encouraged teacher development by showing more progressive attitudes to teaching and learning than others. There were also some who seemed to be more supportive. Secondly, school culture also facilitates teachers' sharing and collaborating through alternative types of activities, such as focus groups, collaborative planning time, lesson observations and staff meetings. In all case studies, school culture was different among teachers on different programmes, as well as between teachers on the same programmes. Teachers in Programme Version I seemed to have more supportive school culture for PD. More teachers commented that they had been sharing and collaborating with their colleagues, a supportive school culture encourages teachers to discuss teaching, and thus, to exchange teaching strategies or models which could be included in one's planning of CAR activities. In the study of investigating the features of effective PD in schools, Simon et al. (2011) find that there was more effective PD where schools had an open and sharing culture and supportive systems. On the other hand, teachers in Programme Version II and III still did not collaborate sufficiently with their colleagues. Huffman & Kalnin (2003) note that changing school culture is a complex process, as it requires various stakeholders to reach a collective vision, and responsibility for the benefit of students.

7.4.3 Government policy

Politics is indispensably the exercise of power (Collins, 2009). Within the social and hierarchic cultures of Indonesia, power is exercised in a top-down approach. This occurs not only in the government but also includes within the education system. Power rests culturally with senior officials in a hierarchical system starting with the President and the Minister for Education at the top of the pyramid and stepping down through the layers of bureaucracy at national, provincial, district and sub-district levels to the sub-district head, school supervisors, heads of schools, and, finally, teachers at the bottom of the hierarchy (Bjork, 2005; Clarke, 2001). Within this political education system, the concept of CAR is an anomaly. Although the theory may be rooted at each level of the system, in reality, individuals at each level depend to the authority of those above – despite technical capacity or perceived local need and context. At the same time, the cultural values of respect for authority and group compliance typically yield a passive and conformed teaching force, in which teachers' decision-making is determined more by fear of disobedience and will to comply and conform, than it is by any sense of creative problem-solving, innovation or professional independence (Bjork, 2005).

Indonesia's education reform policy of improving teachers' quality through its tools of the Law of Teachers and Lecturers No. 14 of 2005 and Regulation of Indonesian Minister of Administrative and Bureaucratic Reform No. 16 of 2009 concerning Teacher Functional Position and Credit Score System where the practice of CAR is included as a part of teacher PD activities and actualised as a ladder for teacher promotion indeed has become a significant influence for teachers in following PD programmes. In addition, the requirement of submitting a minimum of one CAR report (subject to the particular rank a teacher is entitled for a promotion) as a proof as well as a result that teachers has conducted CAR into their practice has changed the way teachers see CAR and its PD programmes. Moreover, the government policy of teacher certification under the Teacher Law promised teachers a better professional allowance equal to their base salary upon successful completion of the programme (World Bank, 2020). The initial design of the programme was to prequalify for certification *e.g.* teachers first had to show their skills through a written competency test, classroom observation, and a portfolio of past training and experience. The idea was that teachers without the right teaching skills would have a clear financial incentive (a doubling of pay through the certification allowance) to improve their skills according to the standard (World Bank, 2020). However, a few studies reported that that this government initiative of teacher certification programme did not increase teachers' quality and student learning outcomes (World Bank, 2020; De Ree et al., 2018). Although the teacher certification programme has improved teachers' income, led to less financial stress, and reduced the number of teachers having second jobs, this programme did not motivate teachers in improving their students' performance (De Ree et al., 2018). Teacher certification in Indonesia has encouraged teachers to aim merely for numbers of training hours completed at top-down, one-shot PD activities outside schools that add the points they collect for their portfolios (Halim, 2011). Accordingly, Rahman (2016) claimed that most certified teachers had barely done anything to enhance their teaching practice or competency, making them no different than uncertified ones. This is shown in the case study especially teachers from Programme Version II who were very motivated to follow the programme in order to use CAR for Teacher Competency Test which is followed by the certification process. Case study reported that teachers were only concerned about the

requirements to fulfill the certification process instead of using CAR to improve the classroom practice.

The Indonesian Ministry' main strategy to implement the policy on teachers' CAR PD programme has been to use top-down approach. Referring to the top-down approach of the Indonesian government, Rahman (2016) and Widodo et al. (2006) found that most of PD programmes attended by the teachers were top-down in nature, with predetermined subjects of PD programmes set by the government. As a result, the PD contents are designed by programme providers without necessarily addressing teachers' actual needs. They exclude the role of teachers in designing and preparing the PD activities (Supriatna, 2011). PD programmes offer short term or 'one-shot' training, and programme providers focus on the quantity rather than quality (of the content materials) (Setiawan, 2009). The case study from Programme Version II reported that the PD programme given to teachers had not succeeded in increasing the understandings and skills required for teachers engaging in CAR. The programme was one-shot PD events, designed without any teachers' involvement and follow-up, based on lectures and assignments, and lacked CAR practice. This is a technical failure, resulting from low supervision within the system to design, fund, implement and evaluate in-service PD programmes. It partially reflected lack of understanding among the policy makers *i.e.* the government and technical practice of implementation. The policy development and implementation approach were top-down and bureaucracy-driven. It did not reflect the realities of schools and teachers. For example, in Programme Version II, it seems that the teachers were handed a practice book - and indeed they used the same book as indicated in the planning documents that they were required to use. Although the questions these teachers asked were not planned ahead of time, the answers were already known. Each question in the assignments had either a correct or incorrect answer; the sole purpose of the assignments was merely to test teachers' knowledge. It lacked the technical understanding and skills needed for the implementation of CAR.

Almost every country has education system reform within the past two decades, but limited number has succeeded in improving their systems from poor to fair to good to great to excellent (Mourshed et al., 2010). Subject to Mourshed et al.'s (2010) education system categories, Sopantini (2014) argues that Indonesia's system may be described in 'poor to fair' stage as the policy acting as an intervention requires "providing scaffolding for low-skill teachers, fulfilling all basic student needs, and bringing all the schools in the system up to a minimum quality threshold" (Mourshed et al., 2010, p.26). Instead under the policy, teachers are sought to exercise considerable professional autonomy as well as to apply, design, and analyse CAR in lessons and classroom practice fit to teachers' and students' needs, to meet the national requirements. The study findings revealed that teachers were not in fact doing anything like this. What most of them did was depending on formulatic approaches to engage in CAR with the main aims of merely meeting administrative requirements.

8 CONCLUSION

The prime aim of this study is to explore the impact of a professional development (PD) programme about Classroom Action Research (CAR) on teachers in Indonesia. As presented in Chapter 3, my research questions consider impact at different levels:

1. What are teachers' experiences on the programme?
2. What do teachers learn from the programme?
3. What changes do teachers think they make to their teaching practice?
4. What are the influencing factors in schools that promote or hinder teachers in using CAR to improve their teaching practice?

To understand the existing perspectives and outline methods for improvements of the current PD programmes about CAR, my study extends PD programme evaluation model to exercise the evaluation of PD in a focused systematic way within a conceptual framework. The analysis of study findings leads to the development of the 'Extended Evaluation Framework', that is a synthesis and adaptation of the previous models. It recognises the strengths and mentions the limitations. The question is if the framework is appropriate for evaluation of the PD programmes or whether, following data analysis, it has to be adapted. Fortunately, findings show that the framework is suitable for the evaluation, and while most of the headings on the framework work well, some are merged, and others renamed. This led to the conclusion that extended framework could provide a more systematic, effective and robust planning and evaluation of PD programmes in developing countries. This extended framework has practical implementations for programme providers as it provides opportunities for more effective and robust planning and designing of a PD programme. These are explained in detail in this chapter as well as the implication of this research in facilitating teachers' PD. The final section deals with the limitations of this particular study and any future research.

8.1 IMPROVED EVALUATION FRAMEWORK

In what follows, the Extended Evaluation Framework is presented. As a result of a literature exploration and an in-depth analysis of the data in my study, each of the components in rthe conceptual framework was elaborated in more detail. More specifically, for each of the components, subcategories found to be important in the evaluation of PD were specified. An exploration of the literature for the suitable framework led to an analysis and synthesis of existing frameworks and the development of a new 'Extended Evaluation Framework' provided as Figure 32, which was based on the impactful works of Guskey (2002) and Bubb & Earley (2010) while also drawing on Hall & Hord's (2011) Level of Use (LoU). This new framework plays an important role in this research as it is implemented and subsequently evaluated for its suitability. Following its use in this study, a few adjustments are made to reflect the diverse nature of the impact being evaluated. They include increased emphasis on the features, levels of teachers' learning and use of practice, and impact at personal, interpersonal and classroom level. This framework recognises and reflects the findings from this study about factors that support teachers' professional learning. It seeks to assess changes in teachers' professional

practice while identifying supportive factors, as very few studies combine details of processes and PD outcomes (Cordingley et al., 2008). This study aims to contribute to the literature as such a detailed framework was not yet developed to help researchers and practitioners in PD programme evaluation specifically about CAR. It also addresses suggestions in the previous literature as it gauges more detailed description on significant components in the PD evaluation (Desimone, 2009), and methods or models of PD evaluation (King, 2014; Guskey, 2014). The framework gives more understanding on components that had to be taken into consideration when conducting a PD programme and desired outcomes which could be measured after following a PD programme. Evaluators of PD programmes may become unable to assess all the components described in the framework as it needs more time and people. However, the framework offers a general view on significant components and helps PD programme providers to prioritise which component to be evaluated. It shows evaluators as to where hindrance factors may come up and connects with with the related components in the extended framework. These components are explored in more detail.

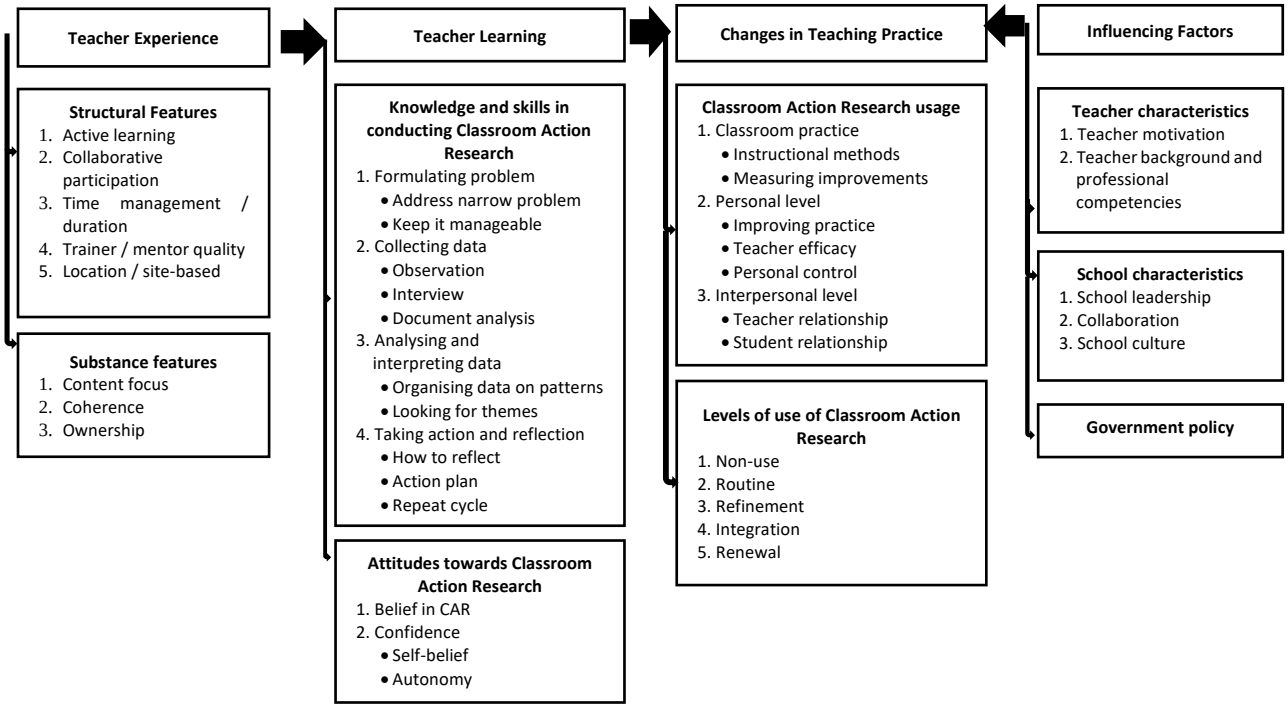


Figure 33. Improved evaluation framework

8.1.1 Teacher experience

My study aimed at finding out main features of effective PD, the initial component in Desimone's (2009) framework. When reviewing the findings in the first research question, eight key features were consistently found to be effective and repeatedly discussed. These eight

features were categorised into structural and substance features (Desimone, 2009; Garet et al., 2001). Structural features refer to characteristics of the activities' structure or design, substance features refer to the substance of the PD activities. In my study, several features were assessed or noted when identifying the PD programme effectiveness.

The structural features include: active learning, collaborative participation, time management/duration, trainer/mentor quality, and location or site-based. On the other hand, substance features include: content focus, coherence, and ownership. Regarding the methods and instruments to identify these features, we evaluated teacher experiences by using surveys, interviews and observations. Researchers in the study of Garet et al. (2008) administer close-ended forms during seminars and programmes to evaluate teacher experience in PD. In addition, Wasik & Hindman (2011) assess the experience by making checklists during observations.

8.1.2 Teacher learning

In the previous section, main programme features were explained which were necessary to take into account PD evaluation. The second component to be concluded is the increase on teacher learning, which is represented as a PD intermediate outcome of the framework. Desimone (2009) categorises the quality of teachers into knowledge and skills, and attitudes, which represents Guskey's (2000) categories of learning goals: psychomotor, cognitive, and affective. When discussing the findings in the second research question, these categories were reflected in the discussion and could be further extended.

Knowledge and skills: Knowledge refers to the organisation and sums of information in teacher learning of the programme (Van Driel & Berry, 2012). Skills relate to what participants can demonstrate with their learning in the PD programme (Guskey, 2000). Based on the conceptual framework, the impact of the programme on teachers' knowledge and skills in relation to CAR was divided into four variables: (1) formulating problem, (2) collecting data, (3) analysing and interpreting data, and (4) taking action and reflection. These shared elements were expanded based on the identification of the expected knowledge and skills in conducting CAR in the discussion. Regarding problem formulation, what teachers require to learn on data formulation is the ability to: 1) address and narrow a problem; and 2) keep it manageable by taking into consideration things such as time requirements (or restrictions), data collection and analysis skill of the individual(s) conducting the research, and any budgetary limitations. Next, what teachers require to learn on data collection is the ability to: 1) observe participants involved in the educational process; 2) use interviews to collect data from students or other individuals; and 3) examine and analyse existing documents or records. Furthermore, what teachers require to learn on data analysis and interpretation is the ability to: 1) identify and organise the data into important patterns and themes to construct some sort of framework for presenting the key findings of CAR; and 2) look for similar or contradicting information in the data with the patterns or trends that have emerged and its implications. Finally, what teachers require to learn on taking action and reflection is the ability to: 1) how teachers reflect their previous step; 2) what teachers put into their action plan; and 3) how teachers overcome the problem by using the repeated cycle.

Attitudes: The affective goals can be measured after investigating teachers' beliefs in CAR and confidence as a PD outcome. Concerning beliefs in CAR, what teachers need to gain is to believe the importance of CAR itself, not only for career promotion or solving a classroom problem, but also for their personal development. When it comes to confidence, teachers need to: 1) believe in their own capacity to make changes; and 2) have an increase sense of autonomy (perceived ownership) to their CAR project.

Regarding the methods and instruments to evaluate teachers' learning, knowledge and skills have been evaluated in many ways. Evaluators have mostly implemented questionnaires or tests to identify teachers' (knowledge) gains (*e.g.* Buczynski & Hansen, 2010; Goldschmidt & Phelps, 2010). Other studies conducted interviews *e.g.* to assess conceptual understandings (Butler et al., 2004; Willemse et al., 2015). As to teachers' attitudes, teachers' interviews (James & McCormick, 2009), digital writing logs (Bakkenes et al., 2010) or surveys have been assessed by means of questionnaires, tests, or interviews.

8.1.3 Changes in teaching practice

Changes in teaching practice are the main focus that explores the impact of a PD programme on teachers' professional learning. This section had been further developed with aspects from the findings. In the findings, changes in teaching instruction after a PD programme were investigated, as the third component in Desimone's (2009) model. It is also important that the programme providers continuously follow up the participants after completing the programme. This would ensure that they are able to successfully incorporate the knowledge and materials in their classroom. This Extended Evaluation Framework specifically looks at changes in teaching practice *i.e.* in classroom practice, at personal level and interpersonal level. In what follows, each subcategory was illustrated with some specific results.

Usages of CAR on classroom practice concern with the adoption of teachers' new practice: 1) creating instructional methods or materials; and 2) measuring improvements in students' learning or motivation. Next, usages of CAR for personal level concern on increasing teachers' knowledge and personal development by: 1) providing teachers with the stimulus for changing and improving practice; 2) increasing teachers' confidence as a teaching practitioner; and 3) giving teachers the control in their own PD. Teacher's efficacy is put under the personal level as it is linked with teachers' beliefs in their power to yield change with correlations between affect and efficacy (Kitching et al., 2009). This study has shown that changes are iterative and can begin at either point; for example, beliefs about the importance of CAR led to further engagement in CAR. Similarly, teachers' experience of CAR engagement led to changes in beliefs and values about collaborative practice, which is followed by the adoption of other collaborative practice which was reflective of the cyclical nature of teacher change (Opfer & Pedder, 2011) and rested on the interplay between these variables in favour of Guskey's (2005) model, arguing that change is linear with changes in beliefs following a change in practice. Furthermore, taking teachers' outcomes at cultural levels offers a more comprehensive approach to looking at levels of teachers' understanding and use of new practice, compared to simply recognising changes in the practice and knowledge of teachers. At last, usages of CAR on interpersonal level concern for teachers to engage with others: 1) teachers' relationships with

other teachers; and 2) teachers' relationships with their students. Other researchers have also focused on looking into effects in teachers' interactions. For example, Butler et al. (2004) report the positive impact of a PD programme on teachers' skill to tailor instruction to students' needs. Kiemer et al. (2015) show positive influence of a PD programme emphasising on giving constructive feedback on interactions between teachers and students. Moreover, Chamberlin (2005) finds a positive relationship of PD on teachers' interaction patterns when analysing students' learning strategies.

Finally, LoU of new and improved knowledge and skills are investigated. This involves a merge of the existing headings of teachers' knowledge of innovation and LoU of new and improved knowledge and skills, as these can be described at five LoUs: Non-use, Routine, Refinement, Integrated and Renewal (Hall & Hord, 2011; Baker et al., 2004). Non-use is the lowest level describes individuals taking no action whatsoever with respect to the new knowledge or skills. Teachers are considered in the Routine level, having established a regular pattern of use but making few, if any, changes, where they would incorporate practice and suggestions acquired from their CAR results into their own new curriculum. Teachers in the Refinement level are those who make changes to the use as a way of making improvements. Teachers in the Integration level are described as making deliberate efforts to coordinate with others and engaged in how to change practice. Finally, teachers in the Renewal level actively sought more effective alternatives to established patterns of use and expressed strong will to change practice in the following year using what had learnt from CAR.

Generally, changes in practices have been assessed with direct or indirect observations, either directly in classrooms (*e.g.* Franke et al., 2001; Buczynski & Hanses, 2010; Ward & Lee, 2004) or subsequently by analysing recorded videos from classroom (*e.g.* Chamberlin, 2005; Doppelt et al., 2009). Moreover, in my case, the analysis of survey (Garet et al., 2001; James & McCormick, 2009) interviews (Butler et al., 2004) writing logs (Bakkenes et al., 2010), and observation notes (Chamberlin, 2005) have been utilised to evaluate changes in teaching practice.

8.1.4 Influencing factors

Data analysis revealed consistencies across the three PD programmes regarding supportive features of sustainability, which were previously discussed. The features became part of the framework under the heading 'Influencing Factors', as this research focused on the importance of teacher characteristics, school characteristics and government policy in the process of teachers' professional learning (Opfer & Pedder, 2011).

Teacher characteristics can affect the effectiveness of a PD programme. In all case studies, it was found that teachers' background and professional circumstances impacted on their learning by determining their learning needs and expectations of the programme. The OECD (2010) emphasised that the distinction in teaching quality was only represented to a limited degree by identities such as teachers' experience and formal education. Consequently, the emphasis has to be on creating better supportive learning environments that match teachers' needs (Hodkinson & Hodkinson, 2005) and let them achieve an 'accepted' level of practice for

sustainability or a 'critical' level of practice which may help a PD multiplier, as in this study, reflective of a transformative model of PD (Kennedy, 2016). In addition, the extended framework provides a guidance to PD programme providers to address the participants' background conditions, *e.g.* professional and educational background, which consequently affects the programme features. By taking consideration of the framework into the selection method, it is important that selected teachers match their needs. This is particularly relevant if the programme is non-voluntary or part of a contractual requirement or co-opted to represent the school (Lambirth et al., 2021), in order to make certain that the programme fulfills teachers' needs (McElearney et al., 2019) as well as gives clear criteria in managing the recruitment of participants to avoid co-opted participation (Lambirth & Cabral, 2017).

The role of school support in a PD programme is explicitly referred to school leadership, collaboration, and school culture. Regarding school leadership, data revealed three characteristics of supportive heads of schools. One had an open-minded attitude towards any new initiatives including CAR project. Another identified is coaching leadership that heads of schools listen to their teachers' problems in conducting CAR and encourage them. The last is a progressive leadership where a progressive head of school encourages teachers to learn and try new ways of CAR and also provides effective school structure and policy to improve CAR implementation. Next, teacher collaboration and the degree of sharing and discussing happened in two ways, through formal and informal meetings. The formal meetings of sharing and discussion were more likely to happen when there was a supportive school policy and culture. On the other hand, informal meetings among teachers seemed to facilitate teacher collaboration the most. Finally, there were two important issues on how to make a supportive school culture emerged. School culture often determines teachers' opportunities to follow out-of-school PD programmes. School culture also facilitates teachers' sharing and collaboration through alternative types of activities.

Contextual factors, such as personal teacher characteristics and school context, have generally been identified by questionnaires and interviews. For instance, Hofman & Dijkstra (2010) utilised a questionnaire to investigate teachers' motivation in participating. James & McCormick (2009) investigate the variety of school contexts with a questionnaire. Moreover, teachers' perceptions of head of school's support (Supovitz & Turner, 2000) and students' social and economic status (Antoniou & Kyriakides, 2013) were also collected by a questionnaire. Interviews can also be utilised to identify school characteristics and information was inquired from teachers or the head of school (Butler et al., 2004).

8.2 LIMITATION OF THE STUDY

This study has several limitations. First, it involved 61 teachers only in a particular location which is Jakarta, Indonesia. Due to this limitation, the evidence gained from this study may not reflect the perspective of teachers in Indonesia in general. Second, some teachers might have feared sharing their views openly and genuinely in the one-to-one interview as teachers tended to view me as a part of the government evaluator and this might have affected how they supplied information to the researcher. Third, my own bias of witnessing a change in the teachers' attitude towards PD, teacher training, and their applications may influence the study. Fourth, I

completed the study within three months period and would not be able to spend prolonged time in the research environment. Furthermore, the use of a classroom observation has not been utilised in this study. This could have provided rich data drawn from the teachers' experiences on real world practice. I deliberately decided not to adopt it due to my concern that classroom observation would add to the existing workload of their job and would be an invasive method that only a few teachers might be willing to accept as they may feel anxious when being observed.

8.3 IMPLICATION FOR RESEARCH

This section presents the study limitations together with implications for educational evaluators and researchers of PD. The first suggestion is to utilise the Extended Evaluation Framework developed in this study in future researchers (*e.g.* journals, theses or educational reports) for theoretically guiding the PD programme evaluation, revealing the results and analysing the effectiveness of the CAR programme. More specifically, research questions can be addressed according to the specific sub-components of the four main components in the framework. Second, it is encouraged for educational researchers to continuously untangle the (sub)components in the extended framework. Even though a literature review was implemented to yield comprehensive framework as possible, specific components might have been missed through the net and might not be in the study. As mentioned earlier, more research is ensured regarding couple of elements integrated into the extended framework, such as the effect of teachers' professional identity in PD (Beijaard et al., 2004). Although particular components of professional identity of teachers have been addressed in the analysis (*e.g.* teacher's self-efficacy) as part of teacher quality (Choi & Morrison, 2014), no results were shown in regard to the studies exploring impact of PD on teachers' professional identity in greater depth. Future studies can also examine the role of contextual supports (*e.g.* head of school supports (Supovitz and Turner, 2000); school administration commitment to teacher PD (Voerman et al., 2015), teacher characteristics (Abuhmaid, 2011) and student characteristics (Pehmer et al., 2015) that may impact the effectiveness of a PD programme. Similar to Antoniou and Kyriakides (2013), it is important to make stronger connections between PD research and teaching practices research to develop a successful approach to teacher PD and to further untangle the relationship between effective PD features, teacher quality, changes in practices and student learning. Moreover, the framework is relied on PD in formal teachers. Further study may also involve PD for other target groups such as teachers in adult education and university professors (Roblin & Margalef, 2013) or concentrate on new models of PD such as technology-based and online PD (Smith & Sivo, 2012; Walker et al., 2012). Study into these new models of PD may result in more detail subcomponents for evaluation. As to the PD evaluators, this extended framework creates an initial point when building and evaluating PD. To do this evaluation in a systematic and focused way, collaboration with researchers in conducting PD evaluation might be advised, for example, to transfer teaching practice or specific content knowledge to teachers (*e.g.* Choi & Morrison, 2014; Willemse et al., 2015) and also to run more complex and intensive data analysis techniques regarding research design, psychometric testing and scaling, analysis and publication (Avalos, 2011). It may also help: (a) to develop more quasi-experimental designs to compare different PD and implement the most effective one in a different context (*e.g.* McCutchen et al., 2002; Nasir et al., 2001; Van Keer & Verhaeghe, 2005); (b) to analyse

multiple data-sets, showing consistency between contexts (Wallace, 2009); and (c) to limit the research–practice gap where teachers have more knowledge to and understanding of study findings on the PD evaluation (Earley & Porritt, 2014). In conclusion, this study focused on important conceptual and methodological base in the PD Evaluation. More specifically, the Extended Evaluation Framework is developed for the focused and systematic PD evaluation by mapping the components that can be evaluated by means of specific measurement tools. Future research can also include this being conducted in the different contexts. The researcher, the participants, and the study location were the instances of the factors that may add different findings in the study (Huberman, 2002).

8.4 IMPLICATION FOR PRACTICE

Most PD programmes tend to rely on the end-of-programme questionnaire survey to evaluate its impact on the teachers' learning. As often being criticised, this is a problematic aspect for the effective impact of PD, because the questionnaire survey cannot reveal whether the programmes are presented with the best contents and strategies by the best providers. The end-of-programme questionnaire answers can only reflect teachers' immediate feelings of their experiences of the programme, and this research shows that teachers tend to give more generous answers to the questions of such questionnaire survey than they think after a certain time has passed. In addition, the critical weakness of the questionnaire survey is that changes in teaching practice cannot be evaluated by the survey. To evaluate CAR impacts on teachers' teaching and learning, it is necessary for them to have some period of reflective and implementation time. This research confirms that evaluating the programmes' impact is a difficult process. It needs a sound understanding of teachers' development, CAR implementation, and teachers' school contexts. Therefore, the process is likely to include questionnaire surveys as well as interviews. Although an evaluation of teachers' change in practice is complex, it is a critical component of a successful CAR programme, because the success of a CAR programme is not the immediate positive response to the programme, but changes in teachers' teaching practice. In addition, the extensive impact reports of PD programmes, such as the report conducted by Bennett et al. (2010) and Scott & Scott (2010) show the effort to evaluate the impact of their programmes on teaching and learning. However, what also needs to be investigated is how the programmes address teachers' needs and how teachers cope with their PD afterwards, having these questions taken from teachers' perspective rather than the programme providers'. The value of this thesis is its in-depth investigation of teachers' views on their experiences of a CAR programme and how their learning is facilitated and hindered in their school contexts.

The important implication of this study is the extended evaluation framework which was meant to explore the impact of the PD programmes specifically about CAR. In the account of performativity, it is needed to evaluate the impact of a PD programme with the value for money (Rhodes et al., 2004) and guarantee for high-quality PD programme design and deliverance. This extended framework provides the urgency of moving from evaluating the impact in terms of teachers' satisfaction to evaluations that focus on measuring impacts at different levels: teaching practice and behaviors; teachers' beliefs and attitudes; teachers' skills and knowledge. It is also necessary to focus on the processes that facilitate the links between teachers' outcomes and school characteristics, something that this new framework takes into account. This extended

framework enables teachers and schools fulfil the needs for PD to be adequately evaluated and in answering Bubb & Earley's (2008, p.6) call for 'an investigation to design and test series of questions for school staff about the quality of learning resulting from the opportunities made available to them'.

A PD activity needs to be 'strategic' to facilitate the journey from school self-evaluation to school improvement, and this framework helps for evaluation of strategic PD to encourage the improvement of students' outcomes and school improvement (Bubb & Earley, 2008), as well as levying teachers' professional responsibility and answering the call for accountability. Significantly for teachers, it enables them to evaluate the impact of their own PD and measure if their actions make a difference. Overall, this research can contribute to developing the quality of PD programmes about CAR by highlighting the importance of analysing individual teachers' needs and addressing them during CAR programmes. It suggests collecting detailed teachers' needs and expectations before the programme, adjusting the programme to address teachers' needs, and evaluating the impact of the programme on teachers' change within several-month time. Although this research shows the complexity and importance of evaluation of PD programmes about CAR, the evaluation results can feed the next PD programmes about CAR, which may address teachers' needs more effectively.

Any one framework will inevitably be limited, so I like to conclude by considering under what circumstance this framework would be of use for evaluators aiming to analyse a PD programme, based on Boylan et al.'s (2018) proposed approach. The first is what the essential elements of the model are and the relationships between them. My framework consists of teacher experience, teacher learning, change in teaching practice, and influencing factors. I discussed that the relationship between elements is a causal chain, yet the ordering of the elements has 'non-recursive, interactive pathways' indicatings that the order is not necessarily fixed. Regarding the scope of the framework, this was a meso model that consider individual teachers in the context of a particular PD programme that has a relatively bounded range of potential outcomes. Regarding the theory of learning, my framework focus was on the experiential nature of PD with learning being embedded within the process of change. Next is the issue of the agency. In my framework, teacher agency arises as a by-product of the process of learning. Finally, the ontological perspective adopted in this framework is constructivism as my framework explored how teachers interacted with and were affected by the PD programmes. This matches the intentions of my research questions because my research primarily focuses on teachers' interpretations of their experiences of the programme.

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APPENDIX – ETHICS FORM

Participant Information Sheet For Indonesian Teachers

YOU WILL BE GIVEN A COPY OF THIS INFORMATION SHEET

Title of Study:

Exploring the impact of a professional development programme about Classroom Action Research on teachers in Indonesia

1. Invitation Paragraph

You are being invited to take part in a research project on the impact of a professional development programme about Classroom Action Research on teachers in Indonesia. Whether or not you take part is your choice. Before you decide, it is important for you to understand the nature of this research.

This Participant Information Sheet will help you decide if you'd like to take part. It sets out why the research is conducted, what your participation would involve, what benefits and risks you might have, and what happens after the research ends. I will go through this information with you and answer any questions you may have. You do not have to decide today whether or not you will participate in this research. Before you decide, you may want to talk about the research with other people, such as family, colleagues, or friends. Feel free to do this.

Whether or not you take part is your choice. If you agree to take part in this study, you will be asked to sign the Consent Form on the last page of this document. You will be given a copy of both the Participant Information Sheet and the Consent Form to keep. If you don't want to take part, you don't have to give a reason, and it won't affect the care you receive. If you do want to take part now, but change your mind later, you can pull out of the study at any time.

2. What is the project's purpose?

Professional development programmes in Indonesia have crucial roles in encouraging and supporting teachers to conduct Classroom Action Research that there is a need to evaluate the effectiveness of the programmes to ascertain the quality and success in Indonesia. An elaborate study of a programme is required to understand the existing perspectives and outline methods for its improvements as there are only a few robust evidences on the impact of a programme on teachers, specifically a programme about Classroom Action Research in Indonesian context.

The purpose of the research is to understand the existing perspectives and outline methods for improvements of the current professional development programmes about Classroom Action Research; while the aim is to make a meaningful contribution to the existing knowledge on the impact of a professional development programme about Classroom Action Research on teachers in Indonesia.

The timetable of the research project can be seen below.

Location	Phase No.	Method	Subject	Time
At the programme	1	Interview	Head of the programme	A week prior to the start of the programme
	2	Survey 1	All the teachers. Aim for 25 responses	Beginning of the programme
	3	Survey 2	All the teachers. Aim for 25 responses	At the end of the 5-week programme
	4	Focus Group Discussion	5 teachers	
At the school	5	Interview	8 teachers	10 weeks after the end of the programme
	6	Document analysis	Teachers' CAR reports, lesson plan.	
	7	Interview	Headteachers	

3. Why have I been chosen?

You are invited to take part in this research because you fit the qualifications to be a participant.

The qualifications to be a participant are as follows:

1. Male/female teacher of a primary school in Jakarta, Indonesia
2. No age restrictions
3. Following a professional development programme about Classroom Action Research conducted by [insert programme provider name]

4. Willing to participate until the end of the research

About 25 to 50 participants will take part in this research.

4. Do I have to take part?

Participation in this research is voluntary; it is up to you to decide whether or not to take part. If you do decide to take part, you will be given this information sheet to keep and be asked to sign a consent form. You can withdraw at any time without giving a reason and without it affecting any benefits that you are entitled to.

If you withdraw from the research, this will mean the following for your participation and data:

1. All identifiable data collected will be withdrawn from the research
2. Data which is not identifiable to the research may be retained as I cannot trace this information back to you
3. No further data will be collected or any other research procedures will be carried out on or in relation to you
4. you will be asked what you wish to happen to the data you have provided up that point

5. What will happen to me if I take part?

If you agree to take part in this research, you will be asked to sign the Consent Form on the last page of this document. You will be given a copy of both the Participant Information Sheet and the Consent Form to keep.

On the last day of the programme, you will be asked to complete a questionnaire about how you experience the programme and what you learn from it. Afterwards, you will also be asked to participate in a focus group discussion as it supports interactive discussion among teachers and helps collect detailed and in-depth information regarding teachers' experiences and learning from the programme.

Approximately 1-2 months after the end of the programme, an interview will be done in your school about the using of your new knowledge and skills of Classroom Action Research and the support the school gives towards the implementation of Classroom Action Research. With you permission, CAR reports and any additional documents that might be relevant will be collected and analysed as it provides in-depth information regarding your experiences in the implementation of Classroom Action Research.

The duration to fill out of the questionnaire is 15 minutes; while the duration of the focus group discussion and the interview is respectively 1 hour.

6. Will I be recorded and how will the recorded media be used?

Yes, you will be recorded during the interview. The audio and/or video recordings of your activities made during this research will be used only for analysis and for illustration in conference presentations and lectures. No other use will be made of them without your written permission, and no one outside the project will be allowed access to the original recordings.

7. What are the possible disadvantages and risks of taking part?

The possible risk from this participation is that there may be a possibility that participants can be identified otherwise than by name, such as by gender, teaching subject, teaching experience, object of their CAR projects, or a combination of these factors.

8. What are the possible benefits of taking part?

Whilst there are no immediate benefits for those people participating in the project, it is hoped that this research will potentially benefit not only academic research community, but also teachers as practitioners. I will share my intention that the outcomes of the research will be valuable for enhancing professional development programmes about Classroom Action Research in the future.

9. **What if something goes wrong?**

Any complaint or concern about the treatment you receive from the researcher during the research, please contact Dr. Sara Bubb, supervisor of this research via s.bubb@ucl.ac.uk in the first instance. However, should you feel that your complaint has not been handled to your satisfaction, you can contact the Chair of the UCL Research Ethics Committee via ethics@ucl.ac.uk.

10. Will my taking part in this project be kept confidential?

Yes. All the information that we collect about you during the course of the research will be kept strictly confidential and ethical and legal practice in relation to all study procedures will be followed. You will not be able to be identified in any ensuing reports or publications resulting from this research. Personal data, e.g. name, contact details, audio recordings, will be handled in accordance with the UK Data Protection Act 1998 so that unauthorised individuals will not have access to them.

11. Limits to confidentiality

- Confidentiality will be respected subject to legal constraints and professional guidelines.
- Confidentiality will be respected unless there are compelling and legitimate reasons for this to be breached. If this was the case we would inform you of any decisions that might limit your confidentiality.

12. What will happen to the results of the research project?

When the result is published in the form of a doctoral thesis, a copy of the thesis will be sent to each participant.

13. Who is organising and funding the research?

The research is organised and funded by Indonesian Endowment Fund / Lembaga Pengelola Dana Pendidikan (LPDP).

Thank you for reading this information sheet and for considering to take part in this research.

Exploring the impact of a professional development programme about Classroom Action Research on teachers in Indonesia

Consent Form

If you are happy to participate in this study, please complete this consent form and return to Ikhsan Abdusyakur in person or at the address below.	Yes	No
I have read and understood the information leaflet about the research.	☐	☐
I agree for me to be recorded during the interview sessions.	☐	☐
I agree for me to be recorded during the Focus Group Discussion.	☐	☐
I agree for my Classroom Action Research report to be collected and analysed.	☐	☐
I understand that if any of my words are used in reports or presentations they will not be attributed to me.	☐	☐
I understand that I can withdraw from the project at any time, and that if I choose to do this, any data I have contributed will not be used	☐	☐
I understand that I can contact Ikhsan Abdusyakur at any time and request for my data to be removed from the project database.	☐	☐
I understand that the results will be shared in research publications and/or presentations.	☐	☐
I understand that other genuine researchers may use my words in publications, reports, web pages, and other research outputs, only if they agree to preserve the confidentiality of the information as requested in this form.	☐	☐

Name_____Signed_____

REQUEST FOR PERMISSION TO CONDUCT RESEARCH IN PRIMARY SCHOOLS

Dear [Sir/Ma'am],

My name is Ikhsan Abdusyakur, and I am a Phd student at Institute of Education University College London in the UK. I wish to conduct a research for my Doctoral thesis which involves the exploration of the impact of professional development programme about Classroom Action Research (CAR) on teachers in Indonesia.

I am hereby seeking your consent to approach a number of primary schools in Jakarta to provide participants for this research. The participants are expected to be 25 to 50 teachers in Jakarta following a 4-week professional development programme about Classroom Action Research (CAR).

In this letter, I have attached you with a copy of my research proposal which includes copies of the questionnaires, participant information sheet, and consent forms to be used in the research process, as well as a copy of the approval letter which I received from University College London Research Ethics Committee.

Upon completion of the study, I undertake to provide the Department of Education with a bound copy of the full research report.

Yours sincerely,

Ikhsan Abdusyakur

University College London

Questionnaires

About this questionnaire

The following questions are about the Classroom Action Research (CAR) training programme, which took place at [add location] on [add date] and [add date].

The questionnaire will take around approximately 15 (fifteen) minutes to complete. Your responses are very important in helping to evaluate the effectiveness of the training.

What will happen with your responses?

Your responses are anonymous, and data will be reported for the whole group only.

All responses will be analysed and published as doctoral thesis.

A copy of the doctoral thesis will be sent to all participants once published.

**Please answer by ticking (√) or crossing (x) the box provided below*

A. Initial Reaction

1. What were your main reasons for taking part in the training?

Please choose as many as apply.

	It is part of my personal development plan
	To improve my skills and knowledge
	I was asked to take part by my head of school
	It is a legal requirement by the government
	Other, please specify: ……

2. How would you rate the training overall? (1 = Very poor, 5 = Excellent)

	1	2	3	4	5
Rating					

3. How much do you feel you learned from the training? (1 = Nothing, 5 = Very much)

	1	2	3	4	5
Rating					

4. What do you feel you have learned or gained overall from the training?

5. What did you like the most about the training?

6. What did you like the least about the training?

7. Which parts of the training did you find the most useful, and why?

8. Which parts of the training did you find the least useful, and why?

9. How could the training be improved, e.g. to meet your needs, make the training more relevant to your job role or provide a better learning experience?

10. How useful was the training in helping you to find out the following? (1 = Not useful, 5 = Very useful)

	1	2	3	4	5
The objectives of the training					
Reasons for my participation in the training					
How the training relates to my job role					
The preparation I needed to do for the training					

11. How useful did you find the reading materials? (1 = Not useful, 5 = Very useful)

	1	2	3	4	5
Rating					

12. How did you feel about going on the training (e.g. excited, worried)? What challenges/problems did you think there might be?

13. Before you attended the training, how did you think it might help you perform your job?

14. How did you find the pace of the training? (1 = Very poor, 5 = Very good)

	1	2	3	4	5
Rating					

15. How did you find the content of the training (e.g. amount and difficulty)? (1 = Very poor, 5 = Very good)

	1	2	3	4	5
Rating					

16. How well was the training structured (e.g. manageable chunks, logical order, linked to objectives)? (1 = Not structured, 5 = Very structured)

	1	2	3	4	5
Rating					

17. How did you find the length of the training? (1 = Too long, 5 = Too short)

	1	2	3	4	5
Rating					

18. Please rate the following aspects of the event facilities and administration (1 = Very poor, 5 = Very good):

	1	2	3	4	5
Administration & enrolment					
Room/venue					
Convenience of location					
Technical support					
Catering					

19. If there was anything that you would have liked to or expected to learn but didn't, please give details:

20. If you have any other comments about the training, please add them here.

B. Programme Features

1. How effective was the training in providing the following? (1 = Not effective, 5 = Very effective)

	1	2	3	4	5
Content relevance					
Coherence					
Active participation					
Collaborative participation					

2. Content Relevance (1= not at all, 5 = very much)

	1	2	3	4	5
The training is relevant for my job role					
The modules show or describe application activities that I can readily implement in my classroom					
The modules provide good theory, but I am not sure how they apply to my work					
The modules have answered some professional questions or concerns I have					

3. Coherence (1= not at all, 5 = very much)

	1	2	3	4	5

The training methods suit the way I prefer to learn					
The trainer related the training to my job role					
The trainer encouraged the transfer of learning to the workplace					

4. Active participation (1= not at all, 5 = very much)

	1	2	3	4	5
I had a chance to share my ideas and opinions					
The trainer established and maintained rapport with the participants					
My specific requirements and feedback were taken into account during the training delivery					
The training encouraged me to continue to learn					

5. Collaborative participation (1= not at all, 5 = very much)

	1	2	3	4	5
Equal opportunities were promoted					
The training involved lot of group activities					

There were opportunities to share and discuss material with colleagues					
There were interactive activities between participants					

6. Overall, how skilled was your trainer in helping you to learn? (1 = Not skilled, 5 = Very skilled)

	1	2	3	4	5
Rating					

7. Please rate your trainer in the following areas (1 = Very poor, 5 = Very good)

	1	2	3	4	5
Knowledge of the subject/activity					
Creating interest in the subject/activity					
Relating thetraining to my job role					
Understanding my needs					
Supporting me to set targets					
Responding to Questions					

8. How far did the trainer encourage the transfer of learning to the workplace? (1 = Not at all, 5 = Very much)

	1	2	3	4	5
Rating					

9. How well did the trainer summarise and review the training at the end of each session? (1 = Not at all, 5 = Very well)

	1	2	3	4	5
Rating					

10. How do you think the training methods could be improved?

11. Did anything prevent you from learning effectively? If so, please give details.

C. Learning

Please rate your skills/knowledge before and after the training using the following scale.
1 = No skills, 2 = Limited, 3 = Moderate, 4 = Good, 5 = Very good skills

1. Formulating the Problem

	1	2	3	4	5
Before the training					
After the training					

2. Collecting Data

	1	2	3	4	5
Before the training					
After the training					

3. Analysing and Interpreting Data

	1	2	3	4	5
Before the training					
After the training					

4. Taking Action and Reflection

	1	2	3	4	5
Before the training					
After the training					

5. Writing Classroom Action Research Proposal

	1	2	3	4	5
Before the training					
After the training					

6. Writing Classroom Action Research Report

	1	2	3	4	5
Before the training					
After the training					

7. If you have any further comments about how far the training helped you develop skills or knowledge in these areas, please add them here.

8. How far do you feel the following training objectives were met? (1= Not met, 5= Fully met)

By the end of the training participants should be able to:

	1	2	3	4	5
Understand the reasoning of Classroom Action Research					
Be motivated to practice Classroom Action Research					
Understand how to define and formulate problems and questions					

Understand how to collect, analyse, and interpret data					
Understand how to take actions and actions					
Be able to make Classroom Action Research proposal					
Be able to make Classroom Action Research report					

9. How far do you believe the importance of Classroom Action Research towards your job? (1 = Disagree, 5 = Strongly agree)

	1	2	3	4	5
Rating					

10. How far do you feel able to perform Classroom Action Research as a result of the training? (1 = Not able to, 5 = Fully able to)

	1	2	3	4	5
Rating					

11. What were your personal learning goals?

12. How far do you feel your personal learning goals were met? (1 = Not met, 5 = Fully met)

	1	2	3	4	5
Rating					

13. Which of your personal learning goals were not met by the training? Please say why:

14. How useful do you think your learning from the training will be for your job? (1 = Not useful, 5 = Very useful)

	1	2	3	4	5
Rating					

15. How confident do you feel about applying your learning in your job role? (1 = Not confident, 5 = Very confident)

	1	2	3	4	5
Rating					

16. How often do you expect to be able to apply your learning in your job role? (1 = Not at all, 5 = Very often)

	1	2	3	4	5
Rating					

17. How far do you feel the training provided the knowledge and skills required for the workplace? (1 = Not at all, 5 = Very much)

	1	2	3	4	5
Rating					

18. How far have the following improved as a result of the training? (1 = Not at all, 5 = Very much)

	1	2	3	4	5
My confidence					
My knowledge and skills					
My motivation to take further steps					

D. <u>Put into Practice</u>

1. What were the 3 (three) main learning points you took away from the training?

Learning point 1	
Learning point 2	
Learning point 3	

2. Please identify 3 (three) new key actions you will be able to put into practice over the next 3 (three) months.

Key action 1	
Key action 2	
Key action 3	

3. How and in what context do you expect to put what you have learned into practice?

4. What will you do differently at work as a result of the training?

5. Is there anything that you are aware of that might stop you using your learning in your job?

6. What things (e.g. people, equipment, skills) might you need to help you use your learning in your job?

Thank you very much for your time.

Interview schedule

Thank you for agreeing to the interview. I appreciate your participation in this research. Your input will be valuable. Firstly, I must comply with the university ethics committee regulations and record your consent to be interviewed. If you are happy to take part in the research, please respond 'yes' or 'no' to the following questions.

1. Are you aware of the nature of the research?
2. Have you had sufficient time to consider whether to take part in this study?
3. Do you understand that your participation is voluntary and that you are free to withdraw from the research at any time?
4. Do you agree that, as part of this research project, audiotapes of your participation in the research will be made?
5. Do you understand that your name will not be identified in any use of these records?
6. Do you voluntarily agree that the audiotapes may be studied for use in the research project and that the information gathered through this process may be used in education journals and other publications and presented at conferences?

Thank you for your consent.

The interview will take approximately 1 (one) hour. Before we start this interview, do you have any questions? If no, let's start the interview.

1. Can you tell me about your experience from the programme?
   (Let the respondent speak freely, but probe if the questions below are not addressed, and ask for examples and illustrations)
   a. What were your main reasons for taking part in the training?
   b. Did you like and enjoy the training?
   c. Did you consider the training relevant to your own needs and/or the needs of the school? Why?
   d. Did you consider it an effective use of your time? Why?
   e. Were the style, pace, content, delivery methods and materials appropriate?
   f. Has the training acted as a motivator towards further learning?
   g. How relevant the material of the training towards your job?
   h. Did the training encourage active participation from the participants? If yes, explain how.
   i. Were there any collaborative activities during the training? If yes, what are they?
   j. Would you recommend the training to colleagues? Why?

2. What do you feel you have learned or gained overall from the training?
   (Let the respondent speak freely, but probe if the questions below are not addressed, and ask for examples and illustrations)
   a. Did you learn what was intended to be taught?
   b. What is the extent of advancement or change in the participants after the training?
   c. How far the training helped you develop skills or knowledge in formulating the problem?
   d. How far the training helped you develop skills or knowledge in collecting data?
   e. How far the training helped you develop skills or knowledge in analysing and interpreting data?
   f. How far the training helped you develop skills or knowledge intaking action and reflection?

g. How far the training helped you develop skills or knowledge in writing CAR proposal and report?
h. How far do you believe the importance of CAR towards your job?
i. How far do you feel able to perform Classroom Action Research as a result of the training?
j. How confident do you feel about applying your learning in your job role?
k. How often do you expect to be able to apply your learning in your job role?
l. How far your motivation and confidence improved as the result of the training?

3. After the training ended, how and for what purpose do you implement Classroom Action Research into practice?
   (Let the respondent speak freely, but probe if the questions below are not addressed, and ask for examples and illustrations)
   a. Were there noticeable and measurable changes in your activities in the classroom?
   b. Were there noticeable and measurable changes in your performance and personal development?
   c. Were there noticeable and measurable changes in your relationships with your colleagues, head of school, and students?
   d. Was the change in performance and new level of knowledge or skills sustained? If yes, how often? If no, why?

4. a. Do you receive any support from the school in conducting Classroom Action Research? If yes, how and is this sufficient? If no, do you want support? If yes, what type of support?
      (If the respondent is not able to answer this question, you can give some hints by asking if the head of school encourages the implementation of Classroom Action Research, if the Classroom Action Research experience is discussed collectively in team meetings, if the respondent provides the sufficient time to conduct Classroom Action Research, if the school environment is conducive to conduct Classroom Action Research)
   b. Are there any barriers in the school that prevent the implementation of Classroom Action Research? If yes, what barriers and how do these barriers prevent it?

That was my last question. Thank you very much for your time. I am going to write a short report based on this interview. I will send this report to you for confirmation. Again, I want to stress that these results will be treated anonymously.

Document Analysis

Classroom Action Research Report Rubric

	Needs improvement	On Target	Exemplary
Goals	Goals are not clearly identified	Goals are identified and related to teaching and learning	Goals are clearly stated, related to teaching and learning and will inform action
Background information	No reference to previous research or theory	2 (two) to 3 (three) references to relevant research or theory	Integrates and synthesises 4 (four) or more sources of relevant research or theory
Methods	Less than 3 (three) sources of data	3 (three) sources of data from the current classroom	Many sources of data from current classroom (case study) or data that are compared with data from another relevant source (i.e. last year's class, another class in the school, state data)
Results	Results are not communicated in an appropriate manner	Results are communicated to solve the problem or goals	Results identify key findings. Communicate results clearly and accurately through themes, graphs, tables, etc
Reflection	Little or no relevant discussion of teaching and learning related to one's own classroom	Discusses how results affect one's own teaching and learning in classroom	Discusses how results affect own teaching and learning in classroom and implications for teaching setting (i.e., other classroom, schools, district, etc.). Also, identifies future research questions
Presentation	• Paper not clearly written • Results are not shared with other audiences	• Paper clearly written • Results shared with local colleagues	• Paper is clear, insightful, and comprehensive • Results are shared with a wider audience

Focus Group Discussion Schedule

Thank you all for agreeing to participate in this Focus Group Discussion (FGD). I appreciate your participation in this research. Your input will be valuable.

FGD will take approximately 1 (one) hour. Before we start this FGD, do you have any questions? Do you mind if I audiotape this FGD? The results will be treated anonymously.

1. Can you tell me about your experience from the programme?
2. Was the training relevant to your work?
3. How would you change the course to make it more useful to you?
4. What were the training's strengths?
5. What were the training's weaknesses?
6. What do you feel you have learned or gained overall from the training?
7. What were the 3 (three) main learning points you took away from the training?
8. Please identify 3 (three) new key actions you will be able to put into practice over the next 3 (three) months.
9. How and in what context do you expect to put what you have learned into practice?
10. Will you be able to implement this training in the classroom?
11. What are challenges that you may face?
12. What are the support that you will need in order to implement what you have learned in this training?

That was my last question. Thank you very much for your time. Again, I want to stress that these results will be treated anonymously.

Tracking focus group comment and answers
It is helpful to have a focus group **facilitator** ask the questions and keep the group engaged and a **scribe** take notes or write answers on a flip chart so everyone can see and track them.