The development of qualitative classroom action research workshop for in-service science teachers

Khajornsak BUARAPHAN

Institute for Innovative Learning, Mahidol University 999 Salaya, Phuttamonthon, Nakhon Pathom 73170 THAILAND

E-mail: khajornsak.bua@mahidol.ac.th

Received 24 Jun., 2015
Revised 8 Mar., 2016

Contents

Abstract

In-service science teachers in Thailand are mandated to conduct classroom research, which can be quantitative and qualitative research, to improve teaching and learning. Comparing to quantitative research, qualitative research is a research approach that most of the Thai science teachers are not familiar with. This situation impedes science teachers' ability to conduct classroom research for answering a wide range of research questions especially qualitative research questions. This study aims to promote the in-service science teachers' understanding of and attitudes to qualitative

research. The research's methodology was a case study. The participants were 32 science teachers (6 male, 26 female) from Uthai Thani province, Thailand. They were asked to attend a three-day qualitative classroom action research (QCAR) workshop. The data collection process included the survey of problems concerning classroom action research (CAR), the pre- and post-surveys of attitudes to CAR, and the reflection on learning from the QCAR workshop. The data were analyzed both qualitatively and quantitatively. The results revealed that the three most problems concerning CAR for the participants were writing qualitative research report, analyzing qualitative data, and designing qualitative research instruments. After attending the QCAR workshop, the participants gained more understanding of CAR and significantly improved their attitudes to the CAR ($t = 4.739$, $p < .01$). The findings from this study lead to the improvement of the QCAR workshop for in-service science teachers nationwide.

Keywords: Qualitative research, action research, in-service science teachers, workshop, Thailand

Introduction

Action research (AR) is defined as "…a form of self-reflective enquiry undertaken by participants in social situations in order to improve the rationality and justice of their own practices, their understanding of these practices, and the situations in which their practices are carried out" (Carr & Kemmis, 1986, p. 162). When AR is conducted by a teacher, it is called "classroom action research" (CAR). To conduct CAR, teachers identify their problems or areas for improvement, and address them through the practices of inquiry, action, reflection, and sharing (Capobianco & Feldman, 2010).

The literature suggests the benefits of the CAR for both the teachers and their students. The benefits for the teachers who conducted CAR include deepening understanding about student thinking and learning (Cox-Petersen, 2001; Megowan-Romanowicz, 2010), changing wisdom about teaching and learning (Megowan-Romanowicz, 2010), enhancing confidence in teaching ability (Llewellyn & Zee, 2010; Megowan-Romanowicz, 2010), transforming attitudes and beliefs about student learning (Llewellyn & Zee, 2010), taking more responsibility in inquiry about teaching (Goodnough, 2010; Kyei-Blankson, 2013), changing of teaching roles and practice (Cox-Petersen, 2001; Subramaniam, 2010), bridging

theory into classroom practice (Goodnough, 2010; Kyei-Blankson, 2013), being more open to new teaching strategies (Kyei-Blankson, 2013), being eager to discuss and share research findings (Kyei-Blankson, 2013), renewing commitment to teaching profession (Megowan-Romanowicz, 2010), and providing authentic teacher professional development (Cox-Petersen, 2001). Also, the students benefit from participate in teaching innovations employed by their teachers during the CAR.

Qualitative classroom action research (QCAR) is now regarded as an alternative approach to serve teachers with more understanding about increasingly complex classroom contexts. The QCAR focuses on context, use of an emergent design and thick description (Sallee & Flood, 2012). It is an inductive approach that can help teachers get deep range of data in their classrooms and provide an ongoing, reiterative process of data generation, analysis, reflection, and action (Klehr, 2012). Qualitative research helps teachers understand their students through the students' eyes, take contexts students bounded with into account, emphasize more on process, and develop grounded theories (Bryman, 2004). The popularity of qualitative research is increasing as the analysis of the papers published in three outstanding science education journals during 2006-2008 revealed that the qualitative approach was used most frequently, followed by quantitative and mixed approach (Devetak, Glazar & Vogrinc, 2010).

The literature presents that QCAR benefits teachers in generating more questions about school works and committing to better understanding of teaching practice (Gratch, 2002), deeply scrutinizing the gap of teaching and conducting on-going investigations of teaching and learning (Mitchener & Jackson, 2012), developing content knowledge, pedagogical knowledge and pedagogical content knowledge (Halai, 2012), and enriching in-depth information to inform teaching and policy (Sallee & Flood, 2012).

Although the QCAR has potential to illuminate some educational dilemmas and provide in-depth perspectives regarding marginalized or unrepresented educational practices, teachers may face several problems in conducting QCAR as weak qualitative research skills e.g. gathering data, building rapport in the field, addressing subjectivity and ethical dilemmas, and complying with institutional review board requirements (Cox, 2012), the privilege of quantitative measurements and experimental research designs in the current policy discourse that forces teachers to think quantitatively rather than qualitatively (Cox, 2012), and time-consuming in conducting qualitative research (Sallee & Flood, 2012). Also, the qualitative

research is seen being less relevant for policymakers because it does not provide prescriptions for best practices or claim to offer "proof" of policy outcomes (Dumas & Anderson, 2014). Regarding this, at best, qualitative research is described as a valuable addition to quantitative models in the form of mixed methods research.

In-service science teachers in Thailand have been mandated to conduct the CAR to improve teaching and learning since 1999 as mentioned in the Section 30 of the National Education Act B.E. 2542 (1999) and Amendments (Second National Education Act B.E. 2545 (2002)).

Educational institutions shall develop effective learning processes. In so doing, they shall also encourage instructors to carry out research for developing suitable learning for learners at different levels of education (Office of the National Education Commission, 2002, p. 13).

In conducting CAR, teachers can use either quantitative or qualitative research methods. However, most of the Thai in-service science teachers are not familiar with qualitative research. This situation impedes science teachers' ability to conduct the CAR for answering a wide range of research questions especially qualitative research questions. Therefore, this study aims to promote Thai in-service science teachers' more understanding for conducting QCAR.

Research questions

- What are the in-service science teachers' problems concerning CAR?
- What are the effects of the QCAR workshop on the in-service science teachers' understanding of and attitudes to QCAR?

Methodology

The research methodology was a case study. The participants were 32 in-service science teachers (6 male, 26 female) from Uthai Thani province, Thailand. The participants' age range was 26 to 55 years old. There were 2, 8, 11, 6, 2, and 3 participants who aged 26-30, 31-35, 36-40, 41-45, 46-50, and 51-55 years old, respectively. There were 22 and 10 participants who graduated in a bachelor degree and master degree, respectively. Two participants taught grades 1-3, 13 participants taught grades 4-6, nine participants taught grades 7-9, one participant taught grades 1-6, and seven participants taught grades 4-9. The teaching experiences of the

participants ranged from three to 33 years. There were only four participants who had teaching experience more than 20 years as Table 1.

Table 1. Participants' teaching experiences

Teaching experience	Number of participant
less than 5 years	6
6-10 years	8
11-15 years	9
16-20 years	6
21-25 years	1
26-30 years	1
More than 30 years	2

Data collection tools and process

The participants were asked to attend the Qualitative Classroom Action Research (QCAR) workshop, which was a three-day workshop aimed to promote the participants' understanding for conducting QCAR. The activities in the workshop can be illustrated as Table 2.

Table 2. Activities in the QCAR workshop

Day	Objective	Topic	Activity
1 (180 min.)	· To introduce differences between quantitative and qualitative research · To promote participants' realization of importance of qualitative research paradigm	Research paradigm	· Pre-survey of attitudes to the CAR · Survey of problem concerning CAR · Interactive lecture on "Quantitative and qualitative research paradigms" · Interactive lecture on "Issues concerning quantitative and qualitative research"
(60 min.)	· To promote understanding of quantitative and qualitative research questions	Research question	· Interactive lecture on "Quantitative and qualitative research questions"
(90 min.)	· To promote understanding of quantitative and qualitative research title and objective	Research title and objective	· Interactive lecture on "Quantitative and qualitative research titles and objectives"

(30 min.)	· To summarize learning, answer questions and clarify confusions	Wrap-up	· Activity 1: Wrap-up of the day
2 (180 min.)	· To promote understanding ofqualitative data collection and practice collecting qualitative data	Data collection in qualitative research	· Interactive lecture on “Data collection in qualitative research” · Activity 2: Practice of observation · Activity 3: Practice of designing interview question · Activity 4 : Practice of individual interview
(150 min.)	· To promote understanding and practice analyzing qualitative data	Data analysis in qualitative research	· Interactive lecture on “Data analysis in qualitative research” · Activity 5: Practice of qualitative data analysis – Constant comparative method (Glaser & Strauss, 1967)
(30 min.)	· To summarize learning, answer questions and clarify confusions	Wrap-up	· Activity 6: Wrap-up of the day
3 (180 min.)	· To practice writing QCAR proposal	Writing QCAR proposal	· Lecture on “Components of the QCAR proposal” · Activity 7: Writing QCAR proposal
(150 min.)	· To critique for improving QCAR proposal	Presenting QCAR proposal	· Activity 8: Presenting QCAR proposal
(30 min.)	· To summarize overall learning	Whole wrap-up	· Post-survey of attitudes to the CAR · Activity 9: Wrap-up of the workshop and write learning journal

Data analysis

The Shapiro-Wilk W test was used to check the normal distribution of the data and its result showed that the data is normally distributed. The participants’ rating of degree of problems concerning CAR, pre-attitudes and post-attitudes to CAR was analyzed for mean and standard deviation (S.D.). In addition, the paired sample t-test was used to check whether the participants’ pre- and post-attitudes to CAR were significantly different. The thematic analysis was used to analyze the qualitative data of the participants’ reflections on learning from the QCAR workshop, in this study. The process of analysis was consisted of: familiarization with data by intensive reading of the participants’ reflections, generating initial codes, searching for themes among codes, reviewing themes, and defining and naming themes. Member check

was used to enhance the validity of qualitative data analysis. That is, the author asked the participants to check the correctness of transcriptions, then, to check their interpretations. At final, the frequency of each theme of participants' reflections was counted and reported.

Results

The participants expressed the three most problems regarding qualitative research: i) writing qualitative research report, ii) analyzing qualitative data, and iii) designing qualitative research instrument. The results of the participants' problems concerning CAR are presented as Table 3.

Table 3. Participant's problems concerning the CAR (n = 32)

Problem concerning CAR	Mean	S.D.
Problem 1: Creating research title	3.38	.871
Problem 2: Identifying history and significance of the study	3.13	.707
Problem 3: Setting research question	3.38	.660
Problem 4: Setting research objective	3.31	.738
Problem 5: Reviewing of related literature	3.56	.948
Problem 6: Designing research	4.03	.897
Problem 7: Designing research instruments	4.13	.833
Problem 8: Analyzing data	4.19	.821
Problem 9: Presenting research results	3.72	.772
Problem 10: Discussing research results	3.81	.821
Problem 11: Writing implications from research	3.56	.914
Problem 12: Writing research report	4.31	.780

From the survey of the participants' attitudes to CAR at the beginning of the QCAR workshop, the participants' mean of pre-attitudes was 5.13 (the total is 7.00). After the workshop, the participants' mean of post-attitudes was 5.81. Then, the paired samples t-test was used and it showed that the participants significantly improved their attitudes to the CAR ($t = 4.739$, $p < .01$) as Table 4.

Table 4. Participants' attitudes to CAR

	Mean	S.D.	Standard	95% Confidence	t	df	Sig.

			error mean	interval of the difference				
				Lower	Upper			
Pre-attitudes	5.13	.554	.098	.983	.392			
Post-attitudes	5.81	.592	.105			4.739	31	.000**

After attending the QCAR workshop, all participants could create their QCAR research proposals and had feedback for improving their proposals. Finally, they reflected many aspects of their learning from the QCAR workshop as Table 5.

Table 5. Participants' reflection on the QCAR workshop (n = 32)

Reflection on the QCAR	Frequency*
Having basic knowledge of qualitative research	13
Understanding of process in conducting qualitative research	11
Understanding of methods to collect qualitative data	7
Opening mind for qualitative research or having more positive attitude to qualitative research	5
Understanding of the QCAR and its benefits	4
Understanding of qualitative data analysis	3
Understanding of meaning and types of qualitative research	3
Understanding of setting qualitative research question	3
Understanding of setting research title	2
Understanding of writing QCAR proposal	2
Experiencing in presenting QCAR proposal	1
Getting group work skill	1

*Note: The total frequencies are more than the number of the participant because one participant could state multiple views in the same questions.

The followings were the examples of quotations about learning from the QCAR workshop reflected by some participants. In term of "Having basic knowledge of qualitative research", one participant reflected that:

> Previously, I have no understanding of qualitative research. After I attended this (QCAR) workshop, I have basic knowledge of doing qualitative research (T05).

(Note: T05 is a code representing the participating science teacher no. 5)

In term of "Opening mind for qualitative research or having more positive attitude to qualitative research', one participant reflected that:

I open my mind for qualitative research. My attitude to research is better. I learned the method to improve myself from listening to other teachers' sharing of their experiences. I found that solving problems related to students in my everyday life of teaching is partially, then, a qualitative research (T12).

Discussion

This study reveals major problems concerning conducting QCAR for a group of Thai in-service science teachers and presents the effectiveness of the QCAR workshop in promoting the participating science teachers' understanding of QCAR and positive attitudes to CAR. Interestingly, the most problem for science teachers is writing a QCAR report rather than conducting QCAR. This is contrast with the problems found by Cox (2012) i.e. identifying and judging problem for investigation and a tendency to formulate hypotheses rather than research questions. The strong emphasis on research report for the participants in this study may reflect one culture for Thai science teachers i.e. placing more value on a product of research than learning during a process of conducting research.

Supported with Megowan-Romanowicz (2010), one major concern reflected by the science teachers is time. Teaching is already a full time job. Many teachers prefer quantitative research such as a survey research more than qualitative research because it demands less time from them. Therefore, effective time-management in conducting QCAR is regarded as one topic should be included in the next version of the QCAR workshop.

Many science teachers open their minds for qualitative research and present more positive attitude to qualitative research that might encourage them to further conduct QCAR in their classrooms to improve their teaching and students' learning. As Cox-Petersen (2001) stated, CAR empowers teachers to actively engage for improving instruction in their own classrooms. It provides real evidence to support changes in science instruction and to participate in on-going professional development. Regarding the findings from this study, QCAR should be promoted to be an essential form of professional development for science teachers nationwide

and worldwide. As Llewellyn and Zee (2010) asserted that CAR is becoming a worthy form of professional development that a) is research-based,(b) centers on authentic and genuine inquiry, c) is data-driven,(d) bridges theory and practice, and(e) is collegial and collaborate (Llewellyn & Zee, 2010). Ultimately, policymakers should accept and promote QCAR as one alternative approach for teachers to understand their classrooms and for themselves in building their policy knowledge to serve more diverse range of stakeholders and audiences (Dumas & Anderson, 2014).

Implications

The findings from this study lead to the improvement of the QCAR workshop in many aspects: adding the topic of effective time-management; adding the collaborative part; and extending from three-day workshop to a long-term, continuous workshop (as suggested by Goodnough (2010)). The QCAR workshop presented in this study can be used to promote teachers' understanding for conducting the QCAR. However, first of all, the importance of the QCAR should be clearly communicated to teachers and teachers should prioritize conducting QCAR for improving their teaching and students' learning. The support from school administrators is also important (Kyei-Blankson, 2013). In addition, the university lecturers can collaborate in the QCAR workshop as genuine partnerships who help teachers build successful QCAR by providing respectful and critical dialogue (Gewirtza, Shapirob, Maguirea, Mahonyc & Cribba, 2009).

References

Bryman, A. (2004). *Social research methods*. New York: Oxford University Press.

Capobianco, B. M. & Feldman, A. (2010). Repositioning teacher action research in science teacher education. *Journal of Science Teacher Education, 21*, 909-915.

Carr, W. & Kemmis, S. (1986). *Becoming critical. education, knowledge, and action research*. London: Falmer.

Cox-Petersen, A. M. (2001). Empowering science teachers as researchers and inquirers. *Journal of Science Teacher Education, 12*(2), 107-122.

Cox, Rebecca D. (2012). Teaching qualitative research to practitioner-researchers. *Theory into Practice, 51*, 129-136.

Devetak, I., Glazar, S. A., & Vogrinc, J.. (2010). The role of qualitative research in science education. *Eurasia Journal of Mathematics, Science and Technology Education, 6*(1), 77-84.

Dumas, M. J., & Anderson, G. (2014). Qualitative research as policy knowledge: Framin policy problems and transforming education from the ground up. *Education Policy Analysis Archives, 22*(11), 1-21.

Gewirtza, S., Shapirob, J., Maguirea, M., Mahonyc, P., & Cribba, A. (2009). Doing teacher research: a qualitative analysis of purposes, processes and experiences. *Educational Action Research, 17*(4), 567-583.

Glaser, B. G. & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Chicago, Illinois: Aldine.

Goodnough, K. (2010). Teacher learning and collaborative action research generating a "knowledge-of-practice" in the context of science education. *Journal of Science Teacher Education, 21*, 917-935.

Gratch, A. (2002). Teachers doing qualitative research: Examining school practices. *Educational Studies, 33*(4), 422-435.

Halai, N. (2012). Developing understanding of innovative strategies of teaching science through action research: A qualitative meta-synthesis from Pakistan. *International Journal of Science and Mathematics Education, 10*, 387-415.

Klehr, M. (2012). Qualitative teacher research and the complexity of classroom contexts. *Theory into Practice, 51*, 122-128.

Kyei-Blankson, L. (2013). Training math and science teacher-researchers in a collaborative research environment: Implications for math and science education. *International Journal of Science and Mathematics Education*. doi: 10.1007/s10763-013-9444-6

Llewellyn, D., & Zee, E.. (2010). Action research: Expanding the role of classroom teachers to inquirers and researchers. *Science Scope, 34*(1), 10-15.

Megowan-Romanowicz, C. (2010). Inside out: Action research from the teacher-researcher perspective. *Journal of Science Teacher Education, 21*, 993-1011.

Mitchener, C. P., & Jackson, W. M. (2012). Learning from action research about science teacher preparation. *Journal of Science Teacher Education, 23*, 45-64.

Office of the National Education Commission. (2002). *The National Education Act B.E. 2542 (1999) and Amendments (Second National Education Act B.E. 2545 (2002)*. Bangkok: Pimdeekarnpim.

Sallee, M. W., & Flood, J. T. (2012). Using qualitative research to bridge research policy. *Theory into Practice, 51*, 137-144.

Subramaniam, K. (2010). Understanding changes in teacher roles through collaborative action research. *Journal of Science Teacher Education, 21*, 937-951.