Advancing Professional Competence Of Teachers Via Classroom Action Research

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Abstract.

Teachers possess a central role in shaping the quality of education by improving professional competence through Classroom Action Research (CAR) training. CAR enables teachers to conduct practical research in the classroom, identifying problems and finding concrete solutions. Training not only improves the teaching skills but also enhances the quality of classroom learning. Therefore, this research aimed to build the capacity for professional competence among teachers at Indonesian School of Kota Kinabalu (SIKK). It also improved the insight and action research skills in the school and Community Learning Center (CLC) in Kota Kinabalu, Sabah, Malaysia. Training strategy was carried out through blended learning both online and offline. The online training used Zoom platform and Google Classroom Learning Management System, while the offline model was performed in Kota Kinabalu. The methods included dialogue, games, direct practice, and assignments. The results showed that teachers' satisfaction with training services was due to the usefulness of the materials, relevance to the needs, and effective communication during training. The understanding and skills in CAR were also found to be increasing. Additionally, teachers needed to make behavioral changes in classroom learning by conducting CAR. This research finally showed that CAR and the publication of the results would improve the achievement and quality of education. The professional competence and CAR were interrelated concepts where CAR functioned as a method to help teachers identify and overcome learning problems in the classroom systematically and scientifically. Furthermore, the professionalism referred to the abilities, skills, and ethics passed by educators to carry out educational roles effectively, and with dignity when CAR was performed.

Keywords: Classroom action research; professional competence; teachers and indonesian schools.

I. INTRODUCTION

Education is the main foundation for building a quality and sustainable society. In the era of Industry 4.0, rapid technological advances make the role of schools in improving education more vital than ever [1-3]. Schools do not only serve as places to transfer knowledge but also opportunities to develop character as well as critical, creative, and innovative thinking skills [4,5]. Teachers serve as the key to the success of the learning process in schools, prompting the competence to be improved based on students' needs. Competence is regulated in Government Regulation Number 74 of 2008 on the four main competencies that should be possessed by teachers, namely pedagogical, personality, professional, and social.Professional competence is related to mastery of subject matter, and learning methodology, as well as broad and in-depth scientific development including the ability to conduct research and compile results based on scientific articles. The ability shows that teachers are not only able to teach and deliver materials to students but also contribute to the development of science through publication. This can be achieved when teachers possess adequate competence in the field of research [6] and those with limitations will have difficulty in applying the methods requiring critical thinking in the classroom. However, competence is relatively low among teachers [7-10]. It is further important to improve the competence in the field of research to develop a culture of critical and innovative thinking in schools. The education system in Indonesia emphasizes the importance of competence as the key to providing quality education.

It also applies to teachers working in Indonesian schools including Indonesian School of Kota Kinabalu (SIKK). SIKK is an Indonesian educational institution in Kota Kinabalu, Sabah, Malaysia. The school is part of several Indonesian schools abroad which are established to serve the educational needs of Indonesian Citizen (WNI) children living in Malaysia, specifically Sabah. SIKK is also part of Indonesian government's efforts to improve bilateral relations with Malaysia in the fields of education and culture. This school is not only important in terms of education but also crucial in strengthening national identity,

supporting social integration, and strengthening relations between countries. SIKK further plays a role in ensuring that Indonesian children in Malaysia can grow and develop in a supportive environment while maintaining a strong connection to Indonesian cultural heritage. Based on research conducted through Forum Group Discussions (FGD) at SIKK, many teachers face obstacles in conducting research and writing scientific papers. This is a significant issue, given the importance of research in broadening perspectives and enhancing the quality of classroom learning [11]. Teachers show interest in writing, particularly in Classroom Action Research (CAR) as these skills can directly help address problems in the classroom or school. However, this interest is often hindered by limited knowledge, a lack of training opportunities, and insufficient guidance in compiling CAR at SIKK. Therefore, focusing on increasing the knowledge and ability to conduct CAR appropriate to the research methodology among SIKK teachers is essential.

Teachers can directly solve problems faced in the learning process through CAR training strategy [12,13]. CAR is a systematic effort made by teachers to overcome certain problems or challenges in teaching practices which further improve the quality of learning in the classroom [14]. Training is also described in the learning innovation as a source of innovation. It is considered to help teachers understand the impact of actions and improve teaching practices through a systematic process. CAR includes several stages, namely planning, acting, observing, as well as analyzing and interpreting. Each stage plays an important role in investigating problems, implementing solutions, gathering information, and improving teaching strategies to achieve better results. Through direct observation in the classroom environment, teachers can understand the real impact of the actions. Additionally, teachers can identify the strengths and weaknesses of the strategies by analyzing and reflecting on the data collected which allows for better and more targeted improvements. The classroom action stage refers to the steps of implementing the action plan prepared in the environment to achieve the research objectives. However, individual action in CAR refers to the steps of implementing the action plan carried out by individuals or research participants independently. The difference lies in the scope of implementation where classroom action is carried out in the classroom environment while individual action is carried out independently by individuals or research participants. Through CAR, teachers can structurally evaluate the effectiveness of teaching strategies. It also provides a strong framework for teachers to continuously improve the practices based on evidence and direct experience in the classroom.

CAR is found to be successful when it can increase students' participation level in learning, improve the understanding of certain subject matter, or implement new and more effective teaching strategies. For example, CAR is conducted to improve the learning outcomes in a particular subject by implementing a more interactive and problem-based learning method. The results show a significant increase in students' understanding and learning outcomes. Additionally, CAR method becomes an effective tool for improving the quality of learning and achieving the desired educational objectives. Training conducted at SIKK is further expected to develop a more dynamic learning environment responsive to students' needs.

II.   METHODS

This training was conducted as a classroom action to improve teachers' competence in conducting CAR. Participants were teachers at SIKK Malaysia and Community Learning Center (CLC) Sabah. Training strategy was carried out using a blended learning method, namely online and offline. Online training used Zoom platform and Google Classroom Learning Management System while, offline model was carried out in Kota Kinabalu, Malaysia. The methods used in the research included dialogue, games, direct practice, and assignments. Furthermore, training result data was analyzed using descriptive statistical analysis.

III.   RESULTS AND DISCUSSION
Demographics of Participants

Teachers participating in this research were 35 teachers with backgrounds in the science, social science, and humanities groups such as art, sports, language, and others. The scientific backgrounds of participants also varied. Among the total participating teachers, only 19 completed the questionnaire distributed. Figure 1 further showed the condition of training participants.
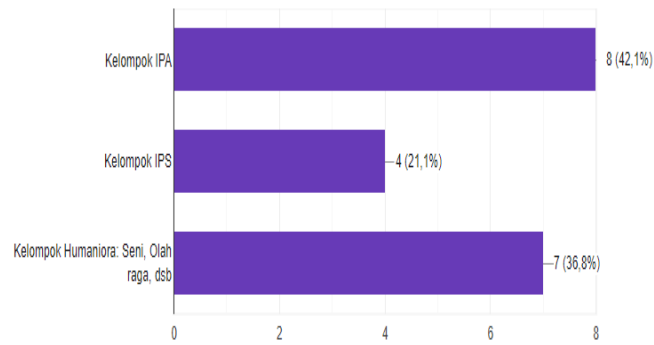
Fig 1. Participants' field of research

Figure 2 showed that the work period with 6-10 years of work experience was 50% while 44.4% had 10-20 years of work experience. These results suggested that teachers were relatively experienced in teaching at SIKK. However, Figure 3 showed that among these teachers, only 21% had not conducted CAR and 79% had performed the research.

Fig 2. Length of Service in Research Participant Teachers	**Fig 3.** Teachers' Experience in CAR
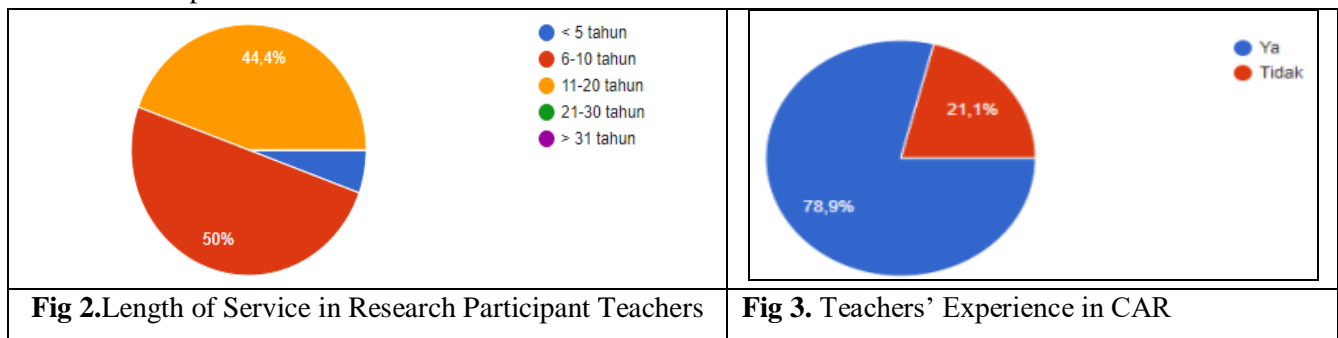
Motivating Factors for Teachers to Conduct CAR

Teachers conducting CAR were driven by a sense of satisfaction when conducting the action which was felt by 81%. Furthermore, 50% of teachers who wanted to prove that they could research with classroom action were owned by 50% of teachers. Teachers who were driven by the feeling of being happy to conduct CAR were 37.5% and those who felt obliged to conduct CAR were 18%.

Fig 4. Teachers' Motivation to Conduct CAR.

The Initial Understanding of CAR

Table 1 showed that training participants' understanding of CAR was less than 75%. This implied that only 65% of the materials about CAR had been mastered by teachers. To further strengthen teachers' understanding and practice of CAR, training session 2 was conducted offline at SIKK with assistance in writing CAR.

Table 1. Teachers' Initial Understanding of CAR

No	Topic	Percentage of Mastery
1	Basic Concept of CAR	56
2	Literature Review in CAR	63.16
3	CAR Method	73.52
4	CAR Systematics	65.8
	Average	64.6

CAR Training Implementation

First Session Training

The first session of training was held on Friday, April 26, 2024, at 01.00-04.00 PM online through Zoom. Based on the features available on Zoom including chat, screen sharing, and hands-up, the community service provider was able to deliver materials effectively where participants could participate actively. Additionally, training could be recorded for re-access with Zoom prompting participants to have access to the materials and recording for re-study. The community service team conducted a live stream and saved it on YouTube with the channel https://www.youtube.com/watch?v=jW7tU-9ZItM. Some of the materials presented were stated in the following:

a) Basic concepts and identification of CAR problems, presented by Dr. Lusila Andriani, M.Hum. This material helped participants to re-understand the nature of CAR and identify specific problems faced that could be solved through CAR.

b) Literature review in CAR, presented by Wulan Tri Puji Utami, M.Pd. This material explained relevant literature to support and build a theoretical basis for the problem examined.

c) Research methods and data collection in CAR, presented by Prof. Dr. Mami Hajaroh, M.Pd. This material motivated participants to determine data collection methods and analysis strategies used to understand and solve identified problems in CAR.

d) Systematics of CAR proposals, presented by Ebni Sholikhah, M.Pd. The material consisted of a structured framework for CAR proposals covering all essential components.

In the initial session, a participant asked about the focus of the class problems that were experienced. Participant communicated the class problems related to students who were less precise in understanding instructions from teachers. Furthermore, the participant asked, "How to focus the research, whether it should be based on students or external factors outside the individuals' condition?" This question was answered by the service provider that narrowing down the research problem should first include the understanding of the main problems experienced by students and in what aspects the problems would be addressed. The participant explained that the problem was similar to a disease in the human body where it was necessary to first understand the part of the body to be treated.After the first session, participants were asked to design CAR proposal before the second training. During the break, participants were assisted online through WA Group where there were any obstacles while compiling the class action proposal.

Second Session Training

This training was held offline at SIKK on June 14-15, 2024, in the School Hall with 30 teachers present. Training was conducted for 2 days with more practice and research writing assistance. Participants were enthusiastic about participating in training as seen from the many questions about CAR and other research. The majority of teachers were currently examining for master's and the thesis writing process, thereby the questions became more extensive about various research topics and methodologies. Participants were considered enthusiastic during training and were disciplined with time. Several participants arrived the day before the event because the three locations were in Tawau, the border between Indonesia and Sabah which had a travel time of 10 hours by land. Teachers also actively participated in discussions, asked questions, shared problems in class, and were open to feedback such as participants receiving and considering input from resource personnel in honing the understanding of the materials. When given envelope game material for ice-breaking, teachers were enthusiastic to follow the process. This game developed teachers' communication skills in groups. Some of the participants' works showed an increase in the ability to use Artificial Intelligence (AI) when finding novelty through Vos Viewer to track reference sources and further indicated a map of the novelty of the research topics.

Training Evaluation

The evaluation was conducted after the first and second training sessions. In the first session, the evaluation was performed using a questionnaire to assess how participants understood the materials. Questions related to the materials were submitted to participants by completing the questionnaire online through Google Form. The effectiveness of training was evaluated using Kirkpatrick model including four components. This included (1) reactions based on participants' satisfaction with training, (2) knowledge in the form of changes in understanding training content, (3) changes in behavior, and (4) results through the impact of training on teachers' professional competence. The evaluation results were further as follows:

Participants' Satisfaction. The satisfaction of training participants was observed from four indicators, namely (1) enthusiasm in participating in this training, (2) usefulness, (3) fulfillment of needs as teachers in conducting research, and (4) satisfaction in this training due to the establishment of interactive communication between participants and resource personnel. The answers showed that 87.5% were very satisfied while 12.5% were satisfied with training.

Table 4. Percentage of Participant Satisfaction

No	Statement	1	2	3	4	5
1	This training is useful for me.				10	90
2	In this training, interactive communication is established between participants and resource personnel.				20	80
3	I need this kind of training.				10	90
4	I am excited to take part in this training.				10	90
	Average				12.5 %	87.5 %

Participant Understanding**.** The second component in Kirkpatrick's evaluation was measuring participants' understanding after attending training. In this component, questions were asked about how much participants felt enlightened, improved in skills, understood more about CAR, and were motivated to conduct research after training. The data showed that 20% of teachers were enlightened, improved in the understanding and skills, and were motivated to conduct CAR.

Table 5. Participants' Understanding of Research

No	Statement	1	2	3	4	5
1	I got enlightenment by following this training.				10	90
2	My research skills improved by following this training.				40	60
3	I understood more about CAR.				40	60
4	I got the motivation to do research after following this training.					100
	Average				20 %	80 %

In open questions, participants needed various other knowledge besides CAR. These included evaluation and quality management, journal writing, blended learning, conflict management, and mental health. Additionally, thesis preparation with diverse research methods, scientific paper writing, differentiated learning methods and media, scientific paper preparation, and scientific paper writing from research results were other knowledge needed by participants. Teachers in SIKK should further update knowledge according to the context of development.

Behavior Change. The evaluation conducted during the end of the session did not show actual behavioral changes after training. However, asking about the follow-up plan to be carried out provided the possibility that teachers would make behavioral changes after training. In this component, questions were asked about the willingness to conduct CAR after training, perform research annually, pay more attention to learning problems for CAR, read numerous references to provide solutions to learning problems and use AI in finding novelty. In the section, the answers were quite diverse where 90% of teachers were ready to conduct CAR but not annually as 20% were still unsure, and only 10% did not do it.

Table 6. Behavioral changes experienced by participants

No	Statement	1	2	3	4	5
1	I will be able to conduct CAR well after this.	-	-	-	90	10
2	I will conduct CAR every year as a form of teachers' professionalism.	-	10	20	60	10
3	I should pay more attention to learning problems in my class to find research problems.	-	-	10	70	20

4	To find solutions to learning problems in my class, I should read a lot of research results in scientific journals.	-	-	20	40	40
5	I will utilize AI to help find research novelty.	-	-	-	50	50
	Average	-	2%	10%	62%	26%

Behavioral change component showed lower results than the satisfaction and strengthening of knowledge or understanding components. This was proven by the data that only 26% of teachers were very ready to make changes in academic behavior while those who were ready were 62%. However, there were still 10% of unsure teachers and 2% were not ready.

Impact of Training. The expected impact was the belief that CAR conducted by teachers had an impact on improving the quality of education and students' achievement. Additionally, CAR would impact the scientific publications. From this component, 86% of teachers strongly believed and 13.4% were sure that conducting CAR would increase students' achievement and the quality of education.

Table 6. Impact of Training on Teachers' Learning

No	Statement	No	Unsure	Sure
1	I will publish the results of my research.	-	40	60
2	CAR will improve my students' achievement.	-	-	100
3	Teachers who always conduct CAR will have an impact on improving the quality of education.	-	-	100
	Average		13.4%	86.6%

After the assessment instrument, participants communicated the experiences openly through writing for the community service groups. The responses to the experiences were very positive which included the following.

1. Delivery of materials with relaxed teaching and extraordinary detail.
2. The knowledge delivered was very useful for teachers in Sabah. Teachers hoped the group would return to Sabah for further training.
3. Grateful to get new knowledge for writing articles and appreciate the knowledge.
4. Gained several extraordinary knowledge.
5. Great. The speaker was open to sharing knowledge and facilitating training participants.
6. Fun. Got numerous insight and useful knowledge.
7. Lots of new knowledge that was previously unknown, specifically the problem of novelty in research.
8. Teachers were happy to partake in training as it increased the insight regarding CAR.
9. Happy and did not regret participating in training because it followed expectations, and all forms of knowledge provided were helpful and supportive for conducting research. The speaker was willing and ready to provide feedback on the learning outcomes attempted by participants.

Training was expected to help improve competence in the classroom. Teachers also expected this activity to achieve the concept of lifelong education. Those who graduated from bachelor's or master's education levels should update the knowledge and skills in learning and other professional competencies. The results of CAR training showed that the need to master professional competence was essential for the achievements of teachers and students, as well as improved quality of education.Improving professional competence through CAR possessed long-term benefits in enhancing the quality of education. Teachers not only improved learning practices but also contributed to the development of science in the field of education with CAR. This research further served as a significant step in improving the quality of teaching and motivating teachers to constantly innovate for more effective and enjoyable learning for students.

IV. CONCLUSION

In conclusion, improving teachers' professional competence with CAR training was useful in the following various manner:

a.   Improving skills to identify reference sources and help teachers to continue learning. Increasing the knowledge of CAR led to various countries and fields of science where teachers learn teaching practices according to students' needs.

b.   Systematic Problem Solving. CAR further provided an opportunity for teachers to identify specific problems and scientifically solve the issue. This would train the educators to think critically, analytically, and logically, which was essential for professional development.

c.   Innovation and Development of Learning Methods. Teachers who did CAR tend to be more creative in finding effective learning methods. In the long term, this allowed for innovation customized to students' characteristics and needs.

d.   Development of Research Competence. Through CAR, teachers also developed the ability to compile and conduct research. This was important for improving professionalism proficient in teaching and understood how to compile and evaluate learning.

Reflection and Continuous Learning. CAR motivated teachers to reflect on teaching practices. The repeated CAR cycle made teachers accustomed to continuously evaluating and improving the learning process, developing a continuous learning culture.

V.   ACKNOWLEDGMENTS

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