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Action Research Training: Its Effect on the Research Attitude, Knowledge, and Performance of Teachers

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Abstract: Action Research Training: Its Effect on the Research Attitude, Knowledge, and Performance of Teachers. Objectives: This study aimed to determine the effect of action research training on the attitude, knowledge, and performance of teachers in research. **Methods:** This study used the mixed methods sequential explanatory design. Forty-one public secondary teachers at Prieto Diaz, Sorsogon, Philippines were purposively chosen as research sample. **Findings**: Action research training that involved collaboration, coaching, and research support from mentors did not significantly improve the attitude and knowledge in research, but was effective in enhancing the performance of teachers in action research proposal preparation. Moreover, the participants claimed that the action research training was useful, effective, and transformative. **Conclusions**: Training, collaboration, support from mentors, favorable attitude, and knowledge contributed to the increased performance of teachers in action research.

Keywords: attitude in research, knowledge in research, performance in research, action research training.

Abstrak: Pelatihan Penelitian Tindakan: Pengaruhnya Terhadap Sikap, Pengetahuan, dan Kinerja Penelitian Guru. ***Tujuan:*** *Penelitian ini bertujuan untuk mengetahui pengaruh pelatihan penelitian tindakan tentang sikap, pengetahuan, dan kinerja penelitian guru.* ***Metode:*** *Penelitian ini menggunakan desain mixed methods sequential explanatory. Sebanyak empat puluh satu guru sekolah menengah negeri di Prieto Diaz, Sorsogon, Philippines terpilih secara purposif sebagai sampel penelitian.* ***Temuan:*** *Pelatihan penelitian tindakan yang melibatkan kolaborasi, pembinaan, dan dukungan penelitian dari mentor tidak meningkatkan sikap dan pengetahuan dalam penelitian secara signifikan, namun efektif dalam meningkatkan kinerja guru dalam menyusun proposal penelitian tindakan. Selain itu, para peserta mengklaim bahwa pelatihan penelitian tindakan bermanfaat, efektif, dan transformatif.* ***Kesimpulan:*** *Pelatihan, kolaborasi, dukungan dari pembimbing, sikap yang baik, dan pengetahuan berkontribusi terhadap peningkatan kinerja guru.*

Kata kunci: *sikap penelitian, pengetahuan penelitian, kinerja penelitian, pelatihan penelitian tindakan dalam penelitian tindakan.*

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INTRODUCTION

Research is indispensable. It brings development to technology and enables people to find cures for illnesses (Garancho & Marpa, 2019), and finds solutions to classroom problems (Basu, 2020; Singh, 2006). Knowing the benefit of research in solving a problem in a school and improving the teaching-learning processes and outcomes, government and school leaders around the world are finding ways how to improve the engagement of teachers in research through seminars and training.

There are studies that found that trainings or courses were effective in improving attitudes, knowledge, skills, and research involvement. For example, teachers' attitudes (Leuverink and Aarts, 2021; Kurniawati, Boer, Minnaert, & Mangunsong, 2017) and knowledge (Digo, 2021a, Leuverink & Aarts, 2019a; van der Linden, Bakx, Ros, van den Beijaard, & Bergh,2015); Staman, Visscher, & Luyten, 2013), and involvement in research (Burns & Wesmacott, 2018) were developed and enhanced after attending training and development. Samosa (2021) also found that teachers viewed capacity building in action research as very effective in capacitating them to work on scientific studies.

Realizing the significance of research in education and the value it contributes to skills development, the Philippines recently implemented the K to 12 basic education program. This reform is in consonance with the provision in Republic Act 10533 that one of the characteristics of the basic education curriculum should be responsive, relevant, and research-based (Enhanced Basic Education Act, 2013) and to include the conduct of educational research as the bases of reforms and policies (Governance of Basic Education Act, 2001). Pursuant to this, the department has issued orders and memoranda to set guidelines not only to carry out the law but also to create policies and programs which are research-based and to provide funding for educational research and studies across all governance levels in the basic education sector (Department of Education, 2017b). But, prior to this, DepEd Order No. 24, series 2010 was disseminated and made grants available for research initiatives (Department of Education, 2010). DepEd ensures financial support to those who are conducting research in public schools. Hence, DepEd Order No. 43, series 2015 set guidelines on the utilization of the Basic Education Research Fund (BERF) (Department of Education, 2015).

Improving the competencies of teacher-researchers on conducting research and publishing research outputs is a significant key improvement of a school strategic and operational plans (Digo, 2021b). To develop teachers' skills in research processes, the Results-Based Performance Management System (RPMS) in the basic education sector included conducting action research as one of the objectives in the Individual Performance and Commitment Form (IPCRF) for master teachers (Department of Education, 2017a). Additionally, one of the duties and responsibilities of a master teacher is to conduct in-depth studies or action research on teaching-learning innovations. And recently, for SY 2021 – 2022, utilizing research-based knowledge in the teaching-learning process is included as one of the key performance indicators in the IPCRF of teachers I to III.

Moreover, the senior high school curriculum of the Philippine basic education includes research subjects that would develop the research skills of both students and teachers. However, many senior high school students found practical research subjects difficult (Brillantes Orbeta, Abrigo, Capones, & Jovellanos, 2019). Learning, teaching, and conducting research are all challenging for both students and teachers, especially if the latter lack experience and training. Students need qualified teachers who have the

knowledge and right attitude towards research, more so, active researchers to be able to guide them in doing research.

Although teachers revealed a positive attitude toward research, they do not fully engage in research activities due to challenges they encounter such as a lack of research knowledge, inadequate training, and limited references (Ulla, 2018), heavy workload, inadequate research centers in the locality, little research experience, and lack of support from research experts (Declaro-Ruedas, & Ruedas, 2020). On the other hand, other teachers don't have a favorable attitude toward research and lack knowledge and skills which demotivate them from involving in research activities (Abun, Magallanes, Incarnacion, & Foronda, 2019; Cortes & Reyes, 2021). When the staff does not possess the required knowledge, skills, attitudes, and habits to do certain jobs assigned to them, then, upskilling is needed (Andres, 1991).

Furthermore, most research teachers are only teaching the subjects but not doing research. In one of the interviews conducted by the researchers, a teacher mentioned that although he is very willing to help his students in accomplishing the requirement of the research subject, he cannot help them even in the process of formulating the title and the statement of the problem or research objectives because he does not have first-hand knowledge and expertise about the subject. Indeed, as Tria, Limpingco, & Jao (1998) said: "One cannot teach what one does not know" (p. 127). The teacher's low self-efficacy when it comes to research is one of the attitudes that is manifested in this situation. Shahzad & Naureen (2017) found that teachers with high self-efficacy deliver instructions effectively, creatively, and impressively than teachers with low self-efficacy. Hence, having low self-efficacy or the belief of teachers that they cannot guide their students in doing research due to lack of knowledge, expertise, and experience hinders them to deliver effective teaching-learning processes.

With this premise, this study implements training for teachers to determine its effect on the attitude, knowledge, and performance of secondary teachers in action research. Specifically, it seeks answers to the questions: (1) What training may be implemented to improve the attitude, knowledge, and performance of the participants in action research, (2) What is the attitude, knowledge, and performance of teachers in action research before and after the training, (3) Is there a significant difference between the attitude, knowledge, and performance before and after the training, and (4) What is the effect of the training on the participants? As used in this study, attitude refers to the perceptions of teachers toward research, knowledge is the mean percentage score of teachers in a quiz, and performance is the number of teachers who developed action research proposals. The participants in this study are forty-one public secondary teachers in the municipality of Prieto Diaz, Sorsogon Province.

METHODS

Research Design

This study used the mixed methods sequential explanatory design in which quantitative data are gathered and analyzed first followed by the qualitative phase (Creswell, 2013; Creswell & Creswell, 2018). Employing this design enabled the researchers to have a better understanding and in-depth analysis of the effects of the action research training on the attitude, knowledge, and performance of teachers in research.

Respondents

Purposive sampling was used to determine the participants of the study from a group of junior high school and senior high school Mathematics, English, and Science teachers in a public

secondary school at Prieto Diaz, Sorsogon, Philippines In this study, 41 public secondary teachers took the pre-test and posttest before and after the intervention. These 41 respondents also participated in the action research training that run from February 2, 2022 to May 4, 2022. Moreover, 19 of the participants participated in the focus group discussion. Most of the participants are junior high school teachers, 31-40 years old, bachelor's degree holders, with 6 – 19 years teaching experience, and attended seminars related to research during in-service training for teachers. The respondents, participants, or informants were chosen because they were assigned to teach the research subjects in senior high school in the absence of research teachers. Moreover, the willingness and commitment to participate in the test, research training, and focus group discussion were also considered.

Instruments

This study utilized a questionnaire with three parts namely: research attitude, research knowledge, performance in research, and a set of open-ended questions to gather the data. The first part of the questionnaire determined the participants attitudes toward research. This was adapted from the questionnaire developed by Papanastasiou (2005) while part two was adopted from a research quiz created by Gray (2020) and from the Action Research MCQ Quiz (Testbook, 2021). Lastly, part three was made up of open-ended questions that determined their performance in research, which were adapted from the indicators in the IPCRF for Master Teachers before the Covid-19 pandemic. A set of open-ended questions to guide the focus group discussion was also prepared. The responses gathered from the teachers' narratives were transcribed and translated manually.

Local experts from the field checked, edited, and face-validated the above-mentioned questionnaire. Then, a copy of the questionnaire was transferred to a Google Form and sent to ten teachers who were not participants in the study for further validation. It was done to determine whether the questionnaire would answer the research problems and to ensure that it had no vague questions. Afterwards, a few revisions were made and the final copy of the questionnaire was sent to the participants before and after the conduct of the research training.

Data Collection Procedure

Before the intervention, a group chat for the participants was created to facilitate the data gathering and sending them information. Also, a letter request to gather from teacher participants was sent to their respective school heads. Then, before and after they attended lectures and discussions on action research and its processes, the questionnaire in google form was sent to each participant. This was done to determine the data on their attitude, knowledge, and performance in research before and after the training.

The responses to the survey of participants' attitudes before and after the action research training were treated with a weighted mean. The equivalent descriptions of resulted weighted mean are as follows: 4.51 – 5.00 (Strongly agree); 3.51 – 4.50 (Agree); 2.51 – 3.50 (Undecided); 1.51 – 2.50 (Disagree); 1.00 – 1.50 (Strongly disagree). Moreover, the participants' knowledge was computed using the equation for mean percentage score adopted from the Department of Education (2012).. The descriptions of each scoring equivalent are as follows: 96 -100% (Mastered); 86 – 95% (Closely approximating mastery); 66 – 85% (Moving towards mastery); 35 – 65% (Average); 15 – 34% (low); 5 – 14% (Very low); and 0 - 14% (Absolutely no mastery)

Data Analyses

The responses of the respondents in terms of their attitude, knowledge, and performance

were analyzed using weighted mean, mean percentage score, and frequency count, respectively. While the hypothesis testing to determine if there is a significant difference in the attitude, knowledge, and performance before and after the training were analyzed using Wilcoxon-signed-test, Wilcoxon-rank test, and McNemar's test, respectively. It utilized IBM SPSS (Version 28) software to aid the computation of inferential statistics involved in the hypothesis testing. Narratives from the FGD were transcribed verbatim, translated manually, and processed using thematic analysis.

RESULTS AND DISCUSSION

The action research training, the attitudes, knowledge, and performance of teachers in action research, and the impact of the training are presented in this section.

Action Research Training for Teachers

The Action Research Training for Teachers was planned, proposed, and conducted from February 2, 2022, to May 4, 2022, via the Google Meet platform since face-to-face interaction was limited then due to the Covid-19 pandemic. The said training involved lectures and discussions about action research, workshops, and collaboration by groups of participants consisting of at most 3 teachers per group. By doing action research collaboratively, teachers would easily recognize and find solutions to classroom problems (Smulyan,1988), thus improves performance. Aside from the collaboration, the teachers also sought the assistance of the coaching team, critiquing by a research expert, revision and editing based on the suggestions of the critique, presentation, and submission to the Schools Division Office of Sorsogon province for further evaluation by the planning and research committee.

Lectures and discussions alone would somehow deepen the understanding of concepts, but coaching would assist teachers to improve their learning and performance. In coaching, the coaches will offer professional support to enhance the performance of trainees (Kamarudin, Kamarudin, Darmi& Saad, 2020). Additionally, social interaction by Piaget suggests that formal instructions be paced so that learners receive the proper and specific assistance when they need it (Nyikos, M., & Hashimoto, R., 1997). In this study, the training was conducted part by part, to provide the teachers with the time to collaborate with their group mates and sought assistance from the coaching team.

Part I of the training started on February 2 – 4, 2022. On day 1, a gathering of the initial attitudes, knowledge, and performance of teachers in research using the questionnaire was done. Then, it was followed shortly by a discussion on the definition, importance, and processes of action research, DepEd guidelines on research management, and crafting the title and research questions. After all the topics had been discussed by the resource speaker, a collaborative workshop and presentation of outputs were done by the teachers. This time, some teachers sought the advice of the coaching team (the team was composed of the researcher, a department head, and two master teachers) on how to write the research questions. In the following two days, the resource speakers discussed on how to write the parts of an action research proposal found on DepEd Order No. 16, s., 2017. Likewise, collaborative workshops and presentations of outputs were done by the teachers.

One week after the training, the participants in pairs or groups of four collaborated in crafting and finalizing the statement of the problem and the other parts of the action research proposal. The draft of their action research proposals was evaluated by a local research expert based on the criteria provided by DepEd Order No. 16, s. 2017. Then, the proposal was revised following the suggestions made by the critic and presented

to their fellow participants to guide others on how to write its content. Finally, the teachers submitted their outputs to the Division Research Planning Unit for further evaluation.

While waiting for the evaluation and approval of their ARP, the last part of the training was conducted. The teachers attended another three days of online training that involved discussions on the parts of completed action research, collaborative workshops, and the presentation of outputs. Before the training ended, the same set of questionnaires was sent to them to determine their attitude, knowledge, and performance in research. Moreover, focus group discussion which was facilitated by a moderator was conducted using the Google Meet platform and was participated by the teacher participants. Using the prepared set of open-ended questions, the moderator asked and gave all participants the opportunity to freely express their answers one by one.

Attitude, Knowledge, and Performance of Teachers

Table 1 presents the attitude of the participants before and after the training. Under usefulness of research, before the training, it shows that the first three indicators with the highest weighted mean are "research approaches are applied to my profession"4.39, "research is useful for my career"4.39, and "research skills are helpful to me in my next assignment/designation/promotion" 4.34 which all described as agree. It can be gleaned from the result that the teachers had a positive attitude or belief that research is useful to their career as revealed by the overall weighted mean of 4.32 described as agree. While after the training, the indicators with equal and highest mean, 4.56 described as strongly agree, are "research is useful for my career" and research skills are helpful to me in my next assignment/designation/promotion". These are followed by "research is connected to my field of study", research is useful for every professional", and "research is very valuable" 4.54 described also as strongly agree. These results suggest that teachers' positive outlook on research usefulness in their profession was strengthened after they attended the training. This is similar to the findings of Maravilla (2020) that Palawan State University (PSU) teachers believed that research is important to the mission of the university and research is useful to their profession and personal lives. Bullo, Labastida, & Manlapas (2021) pointed out that teachers perceive research as an essential tool in designing and delivering instructions to students in improving learning outcomes.

Table 1. Attitude of teachers toward usefulness of research

Indicators	Before the Training		After the Training	
	Weighted Mean	Description	Weighted Mean	Description
Research is useful for my career	4.39	Agree	4.56	Strongly agree
Research is connected to my field of study	4.34	Agree	4.54	Strongly agree
Research is indispensable in my professional training	4.24	Agree	4.44	Agree
Research is useful for every professional	4.27	Agree	4.53	Strongly agree
Research is very valuable	4.32	Agree	4.54	Strongly agree

Research approaches are applied to my profession	4.39	Agree	4.53	Strongly agree
Research skills are helpful to me in my next assignment / designation / promotion	4.34	Agree	4.56	Strongly agree
Research knowledge is as useful as arithmetic	4.27	Agree	4.51	Strongly agree
Overall Weighted Mean	4.32	Agree	4.53	Strongly agree

Presented in Table 2, the first three indicators with the highest weighted mean under research anxiety before the training are (1) research is a complex subject (4.07) described as agree, (2) stressful (4.07), and (3) complicated (3.85) also described as agree. While after the training, "research is difficult" ranked first with a weighted mean of 3.90, followed by "research is stressful" with a weighted mean of 3.85, and "research is a complex subject" with a weighted mean of 3.73 which all described as agree. It can be implied from these results that teachers perceive research as a difficult, stressful, and complex subject even after attending the intervention. On top of the regular teaching load of teachers, conducting research is a difficult task for teachers. In their study, Bullo, *et al.* (2021) found that lack of time and difficulty in writing and conducting research were among the challenges why teachers perceived research as an additional burden. Also, Maravilla (2020) found in his study that a great percentage of PSU teachers are anxious about conducting research.

Table 2. The attitude of teachers toward research anxiety

Indicators	Before the Training		After the Training	
	Weighted Mean	**Description**	**Weighted Mean**	**Description**
Research makes me nervous	3.61	Agree	3.61	Agree
Research is stressful	4.07	Agree	3.85	Agree
Research scares me	3.39	Undecided	3.44	Undecided
Research makes me anxious	3.63	Agree	3.39	Undecided
Research is complicated	3.85	Agree	3.71	Agree
Research is difficult	4.05	Agree	3.90	Agree
Research is a complex subject	4.07	Agree	3.73	Agree
Research makes me insecure concerning data analysis	3.61	Agree	3.61	Agree
Overall weighted mean	3.79	Agree	3.66	Agree

On the other hand, Table 3 shows that the teachers agreed that they can see students benefiting from research which gained a weighted mean of 3.78. In addition, they also believed that research is interesting with a weighted mean of 3.59 described as agree. Also, their responses revealed that they were inclined to study the details of research with a weighted mean of 3.56 described as agree . Likewise, after the training, teachers still agreed that they can see

students positively benefiting from research with a weighted mean of 4.12, described as agree. They also found the research is interesting and they were inclined to study the details of research with a weighted mean of 4.02 and 3.85 respectively, which all described as agree. Generally, the teachers have a positive attitude toward research as revealed by the grand mean of 3.51 described as agree. These results mean that teachers have positive attitude toward research. Although teachers viewed action research as an important tool to improve the teaching-learning process, they are reluctant to do action research due to many challenges they encountered such as an additional load and burden, lack of writing skills, inadequate knowledge, and time constraints (Tindowen, Guzman, & Macanang, 2019).

It can be gleaned from Table 4 that teachers initially believed that (1) research helps in solving daily life problems, (2) research-oriented thinking plays an important role in everyday life, and (3) improves the quality of life with a weighted mean of 3.98, 3.95, and 3.95, respectively, which all described as agree. Similarly, after the training, teachers still viewed that research improves the quality of life, research-thinking skills play an important role in everyday life, and it helps solving daily life problems which gained a weighted mean of 4.41, 4.29, and 4.17, respectively, all described as agree.

Table 3. Positive attitude towards research of participants

Indicators	Before the Training		After the Training	
	Weighted Mean	Description	Weighted Mean	Description
I love research	3.32	Undecided	3.73	Agree
I like research	3.49	Undecided	3.83	Agree
I enjoy research	3.32	Undecided	3.61	Agree
I find research as interesting	3.59	Agree	4.02	Agree
I am inclined to study the details of research	3.56	Agree	3.85	Agree
I can see student positively benefiting from research	3.78	Agree	4.12	Agree
Overall weighted mean	3.51	Agree	3.86	Agree

It means that the teachers believe that research is an important tool for solving problems in life. In the study of Ghalley (2021) teachers revealed a favorable attitude toward the importance of research in their professions and in their daily lives. Leuverink & Aarts (2021) also found that teachers became more innovative and evaluative of their practices in the classrooms after attending the teacher-research course.

Table 4. Attitude of participants toward relevance of research to life

Indicators	Before the Training		After the Training	
	Weighted Mean	Description	Weighted Mean	Description
Research is used in my daily life	3.88	Agree	4.17	Agree
Research-oriented thinking plays an important role in everyday life	3.95	Agree	4.29	Agree

Research improves the quality of life	3.95	Agree	4.41	Agree
Research thinking applies to my personal life	3.90	Agree	4.20	Agree
Research helps in solving daily life problems	3.98	Agree	4,27	Agree
Overall weighted mean	3.93	Agree	4.27	Agree

The results in Table 5 revealed that teachers have trouble with data analysis, have difficulty choosing the appropriate research design, and found it complicated to formulate the statement of the research problem. These indicators gained a weighted mean of 3.76, 3.73, and 3.59 respectively which are all described as agree. Similarly, teachers still agreed that they have trouble with data analysis with a weighted mean of 3.80 described as agree after the training. Further, they believed that formulating the statement of the problem is complicated and choosing the appropriate research design is difficult. These have an equal weighted mean of 3.73 described as agree. For research difficulty, it yielded an overall weighted mean of 3.70 described as agree. These results are similar to the findings of Bullo, Labastida, & Manlapas (2021) which revealed that among the difficulties of teachers in the research were difficulty in analyzing both qualitative and quantitative data, identifying issues and problems to be investigated, doing the research processes and collecting evidences, and organizing and writing the findings.

Table 5. Attitude of participants toward research difficulty

Indicators	Before the Training		After the Training	
	Weighted Mean	Description	Weighted Mean	Description
I have trouble with data analysis	3.76	Agree	3.80	Agree
I find it difficult to understand the concepts of research	3.54	Agree	3.61	Agree
I make many mistakes in research presentation	3.51	Agree	3.61	Agree
I find it complicated to formulate the statement of the problem	3.59	Agree	3.73	Agree
I have difficulty in choosing the appropriate research design	3.73	Agree	3.73	Agree
Overall weighted mean	3.63	Agree	3.70	Agree

Table 6 shows the mean percentage score of the participants in a 15-item test about action research processes before and after the training. It can be gleaned from Table 6 that there is a slight improvement in the knowledge of teachers after they attended the action research training as shown by the mean percentage score (MPS) of 58.58% in the pretest and 63.42% in the post-test both described as an average based on DepEd Memorandum No. 160, series 2012. The increase in the teachers' knowledge in research could be attributed to their attendance to the action research training. Attendance to training increase awareness and knowledge of a specific topic or concept. This is similar to the findings of Leuverink & Aarts (2019b) that teachers showed

positive development in research knowledge after attending the teacher research course. However, this result means that the teachers did not attain mastery of the concepts. Hence, there is a need to improve some aspects of the action research training program in case of future conduct of similar training.

Table 6. Knowledge of teachers in action research

	N	MPS	Description
Pretest	41	58.86%	Average
Post-test	41	63.41%	Average

In this study, the performance of teachers in action research was determined by the number of teachers who have developed an action research proposal before and after the training program. The data are shown in Table 7. The data revealed that there is a significant increase, from 8 to 17, in the number of teachers who prepared an action research proposal after the training. Furthermore, this result means that there is a significant increase in the number of action research developed as outputs of the action research training. This shows that attendance to seminars, trainings, and workshops on research developed the teachers' research skills (Bullo, Manlapas, & Labastida, 2021). Likewise, Digo (2021) reported on the accomplishments of the participants in terms of the number of research proposals, on-going, and completed action researches from participating in action research trainings. Thus, the action research training improved the performance of teachers in research.

Table 7. Performance of teachers in action research

Indicators	Before the Training		After the Training	
	Frequency	% (n = 41)	Frequency	% (n = 41)
Has submitted action research proposal	8	20%	17	41%

With the very limited time given to teachers to write the action research proposals, 17 out of 41 teachers submitted 12 outputs to the Planning & Research Unit of the Schools Division Office for further evaluation and approval. Of the twelve proposals, one was approved for funding through BERF, two (2) were approved by the superintendent, and others were waiting for funding. Enabling teachers to develop action research proposals is one of the impacts of the training program since 33 out of 41 teachers confessed that it was their first time doing such a task. Through the training, teachers were able to beat time constraints, heavy workloads, and lack of experience or research skills. This result is similar to the performance of the faculty researchers who produced 30 action research proposals after attending action research training for two months at Mariano Marcos State University (Sumintac, 2021). Moreover, an integrated research support system along with information, mentoring, administrative, and resource supports may help establish the institutional research culture (Digo, 2022) vis-a-

vis improving the attitude, knowledge, and performance of teachers in research.

Significant Testing on the Difference between the Attitude, Knowledge, and Performance of Teachers in Research

Table 8 shows the results of hypothesis testing for the performance of the teachers before and after the training. The collected data from the respondents were treated with McNemar's Test. The data were treated with null hypothesis at the acceptance level of 0.95 and significance level of 0.05 where its critical value is 3.84 which yielded a test statistic of McNemar's (41,0.05) = 4.293, p = 0.22 which is greater than the critical value of 3.84, thus the null hypothesis is rejected or failed to accept. This result is also validated by the computed probability (p) value which is less than the value of a significant level. This denotes that there is a significant difference in the performance of teachers before and after the training. Furthermore, this result means that the action research training was effective in improving the performance of teachers in developing action research proposals.

Hypothesis testing for significant difference along the teachers' attitudes toward research were tested using parameters such as confidence interval of 0.95, significance level of 0.05, critical value of 1.96, and Wilcoxon-signed test. The results are presented in Table 8. The data show that all indicators along positive attitude and relevance to life have significant differences while most of the indicators along research anxiety and difficulty have no significant difference. These results mean that the degree of difficulty and anxiety the teachers felt about research did not lessen even after they have collaborated and being coached in crafting their action research proposals. Further, it could be concluded that the action research training did not significantly improve the attitudes of teachers toward research difficulty and anxiety. Moreover, the training was not an effective strategy to lessen the difficulty of teachers in doing research. However, it was effective in making teachers realize that research is important and interesting as revealed by the significant difference in positive attitude and relevance to life.

Table 8. Significant testing on the difference between the attitudes

Indicators	Statistical Bases						
	Confidence Interval	Significance Interval	Critical Value	Test Statistics	Asymp. P-val/Sig. (2 tailed)	Decision on Ho	Conclusion
Usefulness							
Research is useful for my career	0.95	0.05	1.96	1.5	0.134	Do not reject	Not Significant
Research is connected to my field of study.	0.95	0.05	1.96	1.641	0.101	Do not reject	Not Significant
Research is indispensable my professional training.	0.95	0.05	1.96	1.886	0.059	Do not Reject	Not Significant
Research is useful for every professional	0.95	0.05	1.96	2.84	0.005	Failed to Accept	Significant

Research is very valuable	0.95	0.05	1.96	2.324	0.020	Failed to Accept	Significant
Research approaches are applied to my profession	0.95	0.05	1.96	1.291	0.197	Do Not Reject	Not Significant
Research skills are helpful to me in my next assignment/ designation / promotion.	0.95	0.05	1.96	2.183	0.029	Failed to Accept	Significant
Research knowledge is as useful as arithmetic.	0.95	0.05	1.96	2.5	0.012	Failed to Accept	Significant
Anxiety							
Research makes me nervous.	0.95	0.05	1.96	0.066	0.947	Do not reject	Not significant
Research is stressful.	0.95	0.05	1.96	1.446	0.148	Do not reject	Not significant
Research scares me.	0.95	0.05	1.96	0.366	0.737	Do not reject	Not significant
Research makes me anxious.	0.95	0.05	1.96	1.319	0.187	Do not reject	Not significant
Research is complicated.	0.95	0.05	1.96	0.832	0.405	Do not reject	Not significant
Research is difficult.	0.95	0.05	1.96	1.263	0.207	Do not reject	Not significant
Research is a complex subject.	0.95	0.05	1.96	2.221	0.026	Failed to Accept	Significant
Research makes me insecure concerning data analysis.	0.95	0.05	1.96	0.085	0.933	Do not reject	Not significant
Positive Attitude							
I love research.	0.95	0.05	1.96	3.038	0.002	Failed to accept	Significant
I like research.	0.95	0.05	1.96	2.738	0.006	Failed to accept	Significant
I enjoy research.	0.95	0.05	1.96	2.276	0.023	Failed to accept	Significant
I find research as interesting.	0.95	0.05	1.96	3.35	0.001	Failed to accept	Significant
I am inclined to study the details of research.	0.95	0.05	1.96	2.448	0.014	Failed to accept	Significant
I can see student positively benefitting from research.	0.95	0.05	1.96	2.841	0.005	Failed to accept	Significant

Relevance							
Research is used in my daily life.	0.95	0.05	1.96	2.425	0.015	Failed to accept	Significant
Research-oriented thinking plays an important role in everyday life.	0.95	0.05	1.96	3.3	0.001	Failed to accept	Significant
Research improves the quality of life.	0.95	0.05	1.96	3.962	0.00	Failed to accept	Significant
Research thinking applied to my personal life.	0.95	0.05	1.96	2.556	0.011	Failed to accept	Significant
Research helps in solving daily life problems.	0.95	0.05	1.96	2.556	0.011	Failed to accept	Significant
Difficulty							
I have trouble with data analysis.	0.95	0.05	1.96	0.338	0.735	Do not reject	Not significant
I find it difficult to understand the concepts of research.	0.95	0.05	1.96	0.785	0.433	Do not reject	Not significant
I make many mistakes in research presentation.	0.95	0.05	1.96	0.816	0.415	Do not reject	Not significant
I find it complicated to formulate the statement of the problem.	0.95	0.05	1.96	0.868	0.385	Do not reject	Not significant
I have difficulty in choosing the appropriate research design.	0.95	0.05	1.96	0.068	0.945	Do not reject	Not significant

The respondents' knowledge as shown in Table 9 were treated with Wilcoxon-rank test to determine if there is a significant difference before and after the action research training. The statistical test has a confidence interval of 0.95 and significance level of 0.05. The computed values suggest that there is no significant difference in the test results on knowledge of teachers on action research before and after the training. This means that the training did not significantly improve the knowledge of teachers on research. Therefore, the action research training was not effective in developing the understanding of research concepts.

Table 9. Difference in the knowledge of teachers before and after the training

Statistical Bases	
Conf Interval	0.95
Sig. Level	0.05
Critical Value	1.96
Test Statistics (W rank)	1.104
Decision on Ho	Do not Reject
Conclusion	Not Significant

Table 10 shows the results of hypothesis testing for the performance of the respondents before and after the interventions. The collected data from the respondents were treated with McNemar's test to determine the difference in their performance before and after the intervention. The data were treated with null hypothesis at the acceptance level of 0.95 and significance level of 0.05, where its critical value is 3.84 which yielded a test statistic of McNemar's (41,0.05) = 4.293, p=0.22 which is greater than the critical value of 3.84, thus the null hypothesis is rejected or failed to accept. This result is also validated by the computed probability (p) value which is less than the value of significant level. This denotes that there is a significant difference in the performance of the respondents before and after the training. This further means that the action research training is effective in terms of capacitating the teachers in developing action research proposals.

Effects of the Action Research Training on the Participants

Aside from the significant increase in the number of teachers who were able to prepare action research proposals, the effects of the action research training on the attitude and knowledge teachers in research are analyzed based on the narratives of the participants in the FGD through thematic analysis. Generally, the impact of the project was identified by the participants along the usefulness, effectiveness, and transformative qualities of the action research training.

Table 10. Difference in the performance of teachers before and after the training

Statistical Bases	
N	41
Df	1
Statistic	4.923
P – value	0.022
Decision on Ho	Failed to Accept
Conclusion	Significant

The action research training was useful.

Before the conduct of the training, teachers agreed that research is useful to their profession. After the training, this belief was sustained. During the conduct of the focus group discussion, teachers (identified as T1, T2, T3, and so on) commented that research is very useful to them since all their practices should have bases to become more effective and efficient, generate knowledge, and find solutions to classroom problems. *"Research is very relevant to my line of work. Because as teachers we should have a basis for everything that we do to become more effective and efficient, more tenacious, not mere hearsay" (T1). "While conducting research we are generating*

knowledge and we discover new information which can be used to improve the teaching-learning process" (T4). "Research is very important for our work. As a result of the new normal, different problems arise between the learners and teachers which makes research even more relevant" (T6).

The foregoing statements, confirm the belief of the teachers that research is useful as revealed by the general weighted mean of 4.32 and 4.53 described as agree and strongly agree before and after the training, respectively. Likewise, it is similar to the findings of Beycioglu, Ozer, & Ugurlu (2010) that teachers want to be involved in educational research as it is important to them. *The action research training was effective.*

The training helped the participants understand how to prepare the action research proposal. According to a participant, the training helped them write every part of the action research proposal because it was discussed part by part. Specifically, their comments are as follows: *"Before, in some rigid training, research really seemed hard. I did not know where to start. We did not have guidance. There was no thorough understanding of the process of research. Because of this training which investigated every detail and part of the research, the burden was lifted. Before it was a burden to me. But with guidance from the expert, my views on research became lighter" (T1). "My views about research were changed. I learned more about the parts. It is easier now. At first, I thought it was too strenuous. But upon listening, it becomes easier. So, I think I will proceed with my research" (T16). "In a way. we understood some parts better. I can appreciate research now. I hope I will be motivated. I hope to motivate myself to finish one" (T3).*

This is similar to the findings of Anh (2017) that the majority of teachers asserted that action research course was effective in developing their confidence to do and understand action research. The action research training was transformative.

Negative attitude toward research was also lessened because the training enlightened the teachers on how to write and conduct action research due to collaborative learning. The positive transformation of the negative attitudes towards action research are clearly reflected in the following remarks given during the focus group discussion: "*I used to have negative views on the research. But now, I have been enlightened. In addition, it helped to be working in groups, at least we can help each other" (T5). "Before I feel pressured by research. I'm not that pressured now. I understand research better, including how to start and how to find the solutions to problems" (T18).*

During their attendance to a course, van den Linden, et al. (2015) found that there was a decrease in the negative beliefs of student teachers toward research. Although the action research training yielded a slight increase and decrease in positive and negative attitudes, respectively, the narratives of the teachers in the focus group discussion claimed that the training changed their views about action research. The training helped them understand and learn to write the parts of an action research proposal.

■ CONCLUSIONS

This study aims to determine the effects of action research training on the attitude, knowledge, and performance of teachers in research. Action research training that involved lectures, discussions, collaborative workshops among participants, coaching, and research support from a team improved the attitude, knowledge, and performance of the participants. However, the improvements in the attitude and knowledge of teachers in research were not significant, hence the action research training was not effective in enhancing these aspects. Teachers need training that provides activities that will enhance their attitudes and knowledge to attain better performance in other aspects aside from

research. The training program significantly improved the number of teachers who produced action research proposals that were submitted for approval and funding. Moreover, it helped them to surpass the challenges of writing action research proposals. Hence, the training is effective in improving the capability of teachers in developing action research proposals. Based on these conclusions, other interventions aside from action research training may be implemented to sustain positive attitudes, knowledge, and performance of teachers in action research.

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