ENHANCING ACTION RESEARCH SKILLS AND KNOWLEDGE OF SCIENCE AND MATHEMATICS TEACHERS THROUGH INTENSIFIED WORKSHOP

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Abstract. This study was conducted to measure how useful intensified workshop to assist DepED teachers in Science and Mathematics in doing action research. The researchers joined in the In-Service Training for Teachers in the 5th District of Iloilo. They discussed concept and procedures on how to formulate action researches. The results showed that several of these science and mathematics teachers had produced title coming from their innovations but very few were successful. This is due to lack of interest and unambiguous understanding of action research.
Furthermore, with highly committed mentors; one elementary science teachers were able to complete the action research and presented in a local science organization. However, none of the mathematics teachers were able to make any proposal due to co-curricular activities like coaches for sports and literary events or advisers for clubs and organization given by their supervisors and principals. Thus, the findings of the study recommended that teachers with high potentials in conducting action research must be recognized, and also promote collaborative efforts among colleagues to help one another to make innovative outputs into functional products to enhance the learning of below average learners.

1. Introduction
According to [1], master teachers entail great passion and love for teaching; thus, they are critical players in learners' experiences as students. Also, they are the one helped fellow teachers prepared and present lessons successfully. They assess and evaluate teachers' strengths, and areas need
Improvements. Being experts in their chosen fields, they should be equipped with knowledge and skills to endorse quality education for all. But above all, they must be creative and innovative to improve the teaching and learning process. All master teachers are required to conduct action research as part of the duties and responsibilities in general supervision.

According to Peter Reason and Hilary Bradbury, action research is defined as a participatory, democratic process concerned with developing practical knowing in the pursuit of worthwhile human purposes, grounded in a participatory worldview which we believe is emerging at this historical moment. It seeks to bring together action and reflection, theory and practice, in participation with others, in the pursuit of practical solutions to issues of pressing concern to people, and more generally the flourishing of individual persons and their communities. (2001, p. 1)

Action researchers at the school level are encouraged to solve problems in the workplace with a plan of action laid out as a result of finding in the study. Collaborative researchers with the academe like the University of the Philippines put in place interventions to problems that evolved in the process of the review.

DepEd is mandated to “undertake national educational research and studies” which can become part of the basis for necessary reforms and policy inputs (Chapter 1, Section 7 (5) of RA 9155). The current administration also recognizes the need for evidence-based policy development by instituting reforms that strengthen transparency and accountability among government entities (Arangco, 2016).

Most widely known, the type of professional development is the workshop [2]. The common characteristic of a seminar as professional development is that a person or team of people thought to be expert in the field are brought in to teach teachers how to accomplish the goal of the professional development activity better. While many other types of professional development can be implemented under the guise of a workshop, the main discriminating factor is that one person outside of those being trained is in control of the schedule and the agenda. This arrangement would include, in many instances, college coursework and attendance at a professional conference [3]

This study utilized a mentor/mentee relationship to enhance the skills and knowledge of both science and mathematics teachers in the Department of Education (DepEd). The Merriam-Webster dictionary defines a mentor as a trusted counselor or guide. According to Byington (2010), a mentor is an individual, usually older, always more experienced, who helps guide another individual's development. The mentor's role is to guide, to give advice, and to support the mentee. A mentor can help a person (mentee) improve his or her abilities and skills through observation, assessment, modeling, and by providing guidance.

The social science literature contains over 50 definitions of mentoring, emphasizing the lack of conceptual clarity (Crisp & Cruz, 2009). Early studies identified two mentoring functions: psychosocial functions (role modeling, acceptance/confirmation, counseling, and friendship), and career functions (sponsorship, exposure/visibility, coaching, protection, and challenging assignments) (Kram, 1983; Schockett& Haring-Hidore, 1985). Career-related functions foster protégés’ professional development; psychosocial functions increase self-efficacy, self-worth and professional identity (Eby et al., 2010). Crisp (2009) identified four domains of mentoring: (1) psychological/emotional support; (2) support for goal setting and career choice; (3) academic support; and (4) role modeling.

The primary objective of this study is to determine the effects of mentor/mentee relationship between science and mathematics teachers in doing action research.
2. Methods

This study utilized need assessment among selected informants through an interview about knowledge and experiences on action research, and document analysis about investigations during undergraduate and graduate programs and training and workshop about action researches. Needs assessment is defined as the process of collecting information about an expressed or implied organizational need that could be met by conducting training. The researchers submitted a letter of request to all schools both elementary and secondary in the northern part of Iloilo to attend enhancing action research skills and knowledge to their educators during the In-service Training for Teachers (INSET). The informants were science and mathematics in primary education coming from Ajuy National High School and District of Balasan in the 5th District of Iloilo, Philippines. Upon the completion of the training, the informants created a title about their innovations implemented inside their classroom.

They also observed some science and mathematics teachers on their methods of teaching. Then, an interview was conducted about the different strategies and techniques used in their classroom.

3. Results

The informants of this study were 12 Science and 12 Mathematics teachers coming from elementary and secondary schools. See Table 1. According to the records collected 10 of the informants were bachelor degrees, 6 are taking graduate studies in management, 6 were on thesis writing on MaED – Science, 4 finished Master in Education major in Mathematics, 2 graduated Master in Education in Educational Management, 3 completed his Doctor of Education in Management, 1 graduated Doctor of Philosophy in Science Education and two mathematics teachers in high school were taking units in Doctor of Education in Management.

Table 1. The informants of this study coming from 5th District of Iloilo

|                | Mathematics | Science | Total |
|----------------|-------------|---------|-------|
| Elementary     | 6           | 10      | 16    |
| Secondary      | 6           | 10      | 16    |
| Total          | **12**      | **20**  | **32**|

According to one of Grade III Teacher;
"I am now old, and I will be retiring soon. If I will go to school, it's just a waste of time and money. I preferred to stay at home during the weekend to take good care of my grandchildren."

One Science teacher in elementary stated;
"I still have children you are college students; my salary is enough for my educational development. Thus, this sometimes hinders my knowledge on doing action research."

Workshop Attended by Science and Mathematics Teachers. Many organizations facilitated training/workshop on action research in local, national and international levels approved by the federal agency.

Based on the experience of a Science Teacher;
“Everything they discussed was very new to me. My knowledge about research is a simple descriptive survey. But I loved to do action research; I wanted to enhance the performance of my learners."

Additionally, elementary mathematics teacher revealed;
"I didn’t know that all my innovations are for action research. I thought action research is about doing something for a study."

Based on the interview conducted, many of these teacher participants attempt to start creating a title, but almost all of them failed to continue.

According to a science teacher in Grade III:
"I have already a title in mind after the training, but because I have other duties and responsibilities to attend, I haven't started anything."

Also, one mathematics teacher stated:
"I love to do action research because I want to improve the performance of my students, but I am also a coach and club adviser. I don't have time to do what I love must."

Also, science teacher revealed:
"I need someone to help me to create a title because even that I don't have enough knowledge. I am willing to pay to have an active research output because I wanted to be promoted."

Another mathematics teacher:
"Doing action research is very difficult."

Based on the output of the training/workshop almost all science and mathematics teachers were able to create a title for action research. See Figure I.

Figure 1. Teacher create a title for action research
But when they were asked if this proposal was based on their innovations to enhance the performance of the learners, one responded:
"I will create innovation without evaluating my learners just to compile with the requirements of our principal."

Another teacher stated:
"I never know that it is important to identify my methods and strategies that help the performance of my learners and make this as action research. I thought I could directly create any innovations for action research."

A male science teacher said:
"Doing action research entails so much time, you must be committed. Also, I have difficulty in understanding statistical tools."

All Mathematics agreed that innovations are significant in teaching mathematics. They also stated:
"Creating new approaches in teaching mathematics such as card games, technologies as well as outdoor activities will help students realized that mathematics is not a difficult subject."
During the INSET Training, all science and mathematics teachers were asked to create a title based on the innovations implemented inside the classroom. See Table 2. Many of the participants were very enthusiastic and happy that they were given hands-on activity even just for the title of research.

One informant said;
"I am so excited about the activity. This will give me the opportunity to help me about engaging in action research. Most of my pupils are below average. I need to do creativity to help these learners."

Another informant stated;
"Creating a title is so easy and simple but when making the actual proposal; I am so scared, it’s tough. Aside from being a teacher, I am also the coach for basketball. I am also a club adviser. My time is so limited to engage myself in doing action research."

Table 2. Science and Mathematics

| Science | Mathematics |
|---------|-------------|
| Elementary Diglossic Approach in Teaching Elementary Science: An Innovative Strategy | Mathematics Concept Kit (MCK) – Its Effect to the Grade IV Pupils on the Remedial EMS Assessment Test |
| | Eco-Trail Strategy to Enhance Pupils Performance in Learning Science |
| | Using Philippine Traditional Games as Instructional Materials in Teaching Science |
| Secondary Individual Activities VS Group Activities: Its Effect on the Academic Performance of Science Students | Cooperative Learning: Its Effect on the Performance of Grade 7 Students in Mathematics |
| | Traditional Based Teaching VS Integrated Instruction in the Context of Science Curriculum |
| | Interactive Instructional Materials: Its Effect on the Performance of Science Students |
| | Differentiated Instruction: An Alternative Way in Teaching Science |
| | |
The researchers visited the selected informants of this study, and they were mentored. The close mentoring approach was utilized because many of the science and mathematics teachers have limited knowledge about action research. Thus, using mentor-mentee could be an excellent strategy to help these educators improved their skills and expertise in action research.

All the participants in the INSET who created a research title, automatically all science and mathematics who submitted a claim became informants. The researchers visited them in their home institution for mentoring. They were trained in different parts of the action research, and how to make a proposal based on the memorandum of DepED.

The different innovations of the informants were identified. The researchers observed the classroom of each informant. Based on the observation, the researchers have discovered various changes such as card games, interactive science teaching using technologies, utilizing social media, songs, and others. But many of the informants don't know how to implement creativity into action research.

They spent a lot of money to help below average learners love science and mathematics. But very few understand that this is innovations.

Figure 2. The teachers

Almost eight informants formulate a proposal, but only two submitted completed research paper; one from mathematics and one from science; both of them were in elementary.

When they asked what motivated them to complete the proposal, they stated;

"Being a teacher it is my commitment to help my students improved their performance. Thus, I am willing to conduct action research even it will take my time. I must know how to manage my time properly. I will conduct this during my class hour. I am hitting two birds in one stone."

Also, one science teacher revealed;

"I wanted to create a proposal but my time is really cannot permit me to finish what I have started. I have here my introduction, my methodology is still hanging, but the mentor already explained everything to me."

Also, one informant confirmed;

"I was so busy doing other things; I need to submit documents required by my principal. Also, I am overload, and I still coaching a sporting event."
Then, another also said;
"I was asked by my head teacher to be an adviser of our club. I am also the coach of basketball. My time is so limited for creating a proposal."

While one male mathematics teacher said;
"We need money to conduct action research. But my salary is only enough for my family. I always spent much on instructional materials."

Engage in Action Research. Both the two proposals implemented the action research, but only one was completed. This is "Diglossic Approach in Teaching Elementary Science: An Innovative Strategy."

This science teacher able to finish her study because according to her;
"I have no choice but to conduct this study because the principal required me as a Master Teacher. This is one of my duties and responsibilities. But with the help of the mentors, doing action research is easy and fun. I am now equipped and ready to do on my own."

The output completed was presented to 17th Annual Regional BIOTA Convention and Scientific Sessions last February 2017 at Sarabia Manor Hotel and Convention Center by the researcher. The teacher-researcher was not able to present the paper because she was not allowed to attend the conference due to some financial constraint.

However, when she was asked about the presentation;
"I am willing to present the paper at the conference. This will help boost my interest in doing action research. The suggestions of the experts at the conference will enhance this paper." This showed that the informant has an idea of the importance of presenting a research paper at any conferences. Thus, it must be given the priority of the school heads to help their educators to experience oral or poster presentations.

Also, she stated;
"I will try to present this paper next but in a higher level because our teachers in graduate studies are always telling us to present our research outputs. Research conferences often help us boost our interest to engage more in doing action research."

This research project is an excellent start to understand the needs of DepED teachers in the district. This is also the baseline to conduct more researches in the future.

We are also encouraging the informants to finish their proposal within the year. We are willing to help them enhance their action researches.
"I promised that no matter how heavy my loads and duties, I will take time to complete my proposal. This is just a matter of time management. My experienced as informants of this study inspired that action research is elementary if you love your students and your job."

Another informant uttered;
"I will submit myself to commit what I have started. This mentoring is very important to me as well as to my other co-teacher. We have valued the sharing of the mentors to us."

4. Conclusion
All the informants of this study were trying to improve their educational qualifications. They are interested in going for graduate studies which they believed are relevant for being educators. But almost all of them took management degree instead of science and mathematics because they wanted to become administrators or specifically principal. There were scholarships for graduate studies in science and mathematics but very competitive; thus, very few were interested because of family, the location of the award and support from school heads. Furthermore, all research outputs during their undergraduate and graduate programs were all detailed/survey research; hence, their knowledge and skills in doing action research are insufficient. This results to very few engaged in conducting action research.

All training/workshops organized on action research were all knowledge-based. All organizations who facilitated training on action research must evaluate the entire outcome to the participants. They must conduct follow-up training for the participants to know if the workshop was useful or not. This is to check if they were able to create action research upon returning to their station.

Thus, the mentor-mentee approach is the best method to help DepEd teachers in doing action research in term of creating a title. But if they were asked to continue for proposal very few engaged because of limited time due to another designation is given such as coaches, class and club advisers, and office work. Thus, only one completed action research and presented at a regional conference. They were planning to give this paper in an international for a.

Based on the results commitment should be a priority. Time management is essential for science and mathematics teachers. But, all administrators must encourage their teachers to engage in research and de-loading should be adequately implemented. Master teachers must be encouraged to conduct action research to help other teachers in the district or the school. But many of the informants wanted to create action research because they have already innovations implement in their respective classroom.

5. Recommendation
Based on the results of the study, training and workshop should be adequately planned to make it more effective among Science and Mathematics Teachers in the 5th District of Iloilo most especially that our results in National Achievement Test were always below the national standard. We have to enhance teaching skills and knowledge of our Science and Mathematics Teachers to encourage

6. References
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