Research Article

NEEDS ASSESSMENT ON ACTION RESEARCH COMPETENCIES OF TEACHER-RESEARCHERS IN SURIGAO DEL SUR, PHILIPPINES

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Abstract

This study assesses needs of teacher-researchers (n=247) in Surigao del Sur, Philippines which employs cross-sectional, descriptive research design. The preliminary phases of this study were the development and validation of an instrument which examines their competence on action research (AR), and clustering them based on the similarity of their responses through Hierarchical Cluster Analysis. The factor analysis in instrument development yields five competencies in conducting AR, namely: (a) problem identification, (b) data collection, interpretation, action, and reflection, (c) appropriate use of data collection tools, (d) application of technology, and (e) research ethics which total percentage of variance explained is 77.52. Meanwhile, the Cluster Analysis created two clusters of teacher-researchers. Cluster 1 (n=113) perceived themselves proficient in all five competencies while teachers in cluster 2 (n=99) rated themselves proficient in three competencies except in the application of technology and research ethics where they consider themselves advanced. However, these levels still indicate recalibration of competencies to both clusters. In this regard, this study suggests that the capacity building programs on AR organized by their division research office need an alignment with the competencies specified per factor. Further, mass training of teachers should be refrained because they are not of the same level of competence or eventual needs in doing AR.

Keywords: Action Research Competencies, Factor Analysis, Hierarchical Cluster Analysis, Needs Assessment

Introduction

Addressing practical issues and expanding the body of scientific knowledge are collective attributes of an action research (AR) (Wagaba, et al., 2016). In effect, it gains popularity in understanding complex social situations such as improving existing business models (Auer & Follack, 2002), responding to marketing problems (Donnelly, et al., 2012), implementing organizational change (Sankaran & Ranjan, 2010), and even resolving environmental issues (Wals, 1994). In the realm of education, it represents an important variable to teachers' professional development (PD) (Vogrinc & Zuljan, 2009; Brookmyer as cited in Pine, 2009), an important information base for reflective practice, provides valuable knowledge for classroom practice, and provides a context for the transformation of practice (Brookmyer as cited in Pine, 2009). Doing AR also results to increase in self-knowledge which eventually translates into improvement of teacher's personal character and professional image (Morales, et al., 2016). Further, it can respond to problems pertaining to curriculum, assessment, instruction, policy, program evaluation, allocation of resources (Ferrance, 2000), and could even address larger institutional and societal goals (Lytle, 2000). Consequently, AR has become an attractive option among teacher-researchers, school administrative staff, and their stakeholders when dealing practical problems found in educational settings (Mills, 2011; Stringer, 2008). This claim could be justified by a plethora of action researches published online (e.g. Unlu, et al., 2015; Burns, 2016; Vogelzang & Admiraal, 2017).

Acknowledging its relevance, several initiatives have been directed and are increasingly visible aspects of reforms in both basic and higher education institutions. The initiatives include offering PD courses to teacher-researchers (Meerah & Osman, 2013), introducing a core unit in AR methodology in teacher education program (Hine, 2013), and linking research to government fundings (Li, et al., 2008). In the Philippines, the efforts are likely the same but there are still quite a few challenges which constrain them to conduct AR. These pertain to challenges in data organization and analysis, literature searching, writing the technical report, heavy teaching loads, and the lack of monetary assistance from the school (Morales et al., 2016; Ulla, et al., 2017; de Borja, 2018). In other words, there is still a need to recalibrate PD programs and revisit institutional policies to address these issues (Morales, et al., 2016). Otherwise the novel solutions which could address the educational problems thriving into the system would remain unresolved not unless the teachers are provided the opportunity to reflect on these issues and address them with theory laden solutions. The premise is that teachers remain "expert knowers" and "promising

researchers" considering their immediate contact with the students (Hahs-Vaughn & Yanowitz, 2009) and their researches are classified "legitimate and unique form of knowledge generation" (Cochran-Smith & Lytle, 1992).

However, the pre-identified challenges may not be the representation of the case in Surigao del Sur, Philippines. Hence, an auxiliary and specific identification of needs among teacher-researchers in basic education of the aforecited province is relevant. Further, such identification allows hitting the core challenges these teachers have encountered leading to the provision of appropriate capacity building and PD programs. Along with the needs assessment, a development and validation of instrument takes as preliminary phase of the study which uses a separate research design. This instrument examines teachers' self-perceived competence in conducting AR by creating specific indices per competency to identify these challenges. Thus, it gives the present study a novel contribution because most empirical studies drawing the needs and challenges of teachers are qualitative-descriptive (e.g. Morales, et al., 2016) or case study (e.g. Zhou, 2012) in nature due to the absence of a valid and reliable quantitative instrument. Finally, the teachers were clustered using Hierarchical Cluster Analysis, a multivariate interdependence technique, to segment them based on the similarity of the their perceived level of competence or needs.

Methodology

Research Design

This study uses cross-sectional, descriptive design under quantitative non-experimental research. Lapan and Quartaroli (2009) argue that such design is appropriate when conducting needs assessment or documenting the status quo of a given area of interest. It is classified as cross-sectional because the teacher-researchers were clustered based on the similarity of their responses then compared. With respect to the development and validation of instrument in the preliminary phase, an exploratory sequential design (QUAL→QUAN) under mixed-method approach was used.

Re-entry Protocol and Prior Arrangements

A transmittal letter was forwarded to the school's division superintendent thru the division research coordinator prior to the administration of the instrument. Upon approval, the participants were notified and encouraged to ask about the process they went through. Their participation was entirely voluntary and they were notified that they can withdraw their participation anytime. No names were obtained to protect their privacy.
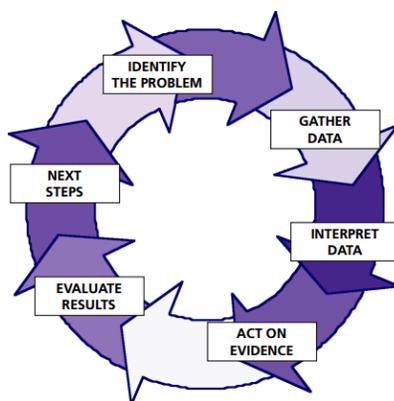
Instrument Development

Figure 1 Phases of Conducting Action Research (Ferrance, 2000)

Four books sources provided the principal bases in generating items of the instrument. These were Action Research (Ferrance, 2000), Action Research for Improving Practice: A Practical Guide (Koshy, 2005), A Practical Guide to Action Research for Literacy Educators (Nugent, et al., 2012), and Action Research in Education: A Practical Guide (Efron & Ravid, 2013). Ferrance's (2000) book is one of the editions in a series called "Themes of Education." It provides relevant information on AR topics of interest in education, nature of AR and its development. On the other hand, the practical guides of Koshy (2005), Nugent, et al., (2012), and Ravid (2013) present gradual steps in conducting AR. In addition to these sources, the empirical study conducted by Morales, et al. (2016) on examining teacher's conceptions and needs of AR in the Philippines was used as supplemental source. From all of these sources, 81 items examining competencies were constructed representing five phases of conducting AR as structured by Ferrance's (2000) and some related competencies. These phases are as follows: identification of research problem; gathering and interpretation of data; acting on evidences; and evaluating results (See Figure 1). Although no specific ruling on the ideal number of items to be contained in an instrument but some helpful heuristics exist such as internal consistency and parsimony (Thurstone, 1947). The eighty one (81) items were reviewed by four (4) content experts represented by one professor in research instrumentation, one PhD student in science education, one professor/researcher specializing participatory action research, and one education program specialist which heads the research office in one DepEd division handling AR to be specific. On the bases of their suggestions, some items were omitted and modified leaving 73. Each item was rated on a five (5)

point scale representing the following levels of classification: "1" Limited; "2" Basic; "3" Proficient; "4" Advanced; and, "5" Expert (Russo, 2016).

Pilot Testing and Test of Internal Consistency

The coefficient alpha was computed as a measure of internal consistency of the 73-item statements with five-point scale from 50 purposively chosen teachers. These teachers have previous trainings and experienced conducting AR and are chosen regardless if they are from elementary or secondary and with the subject they are teaching. Javali, et al. (2011) claim that 50 respondents are good quantity of sample size for pilot-testing or to estimate internal consistency for items which scale is within five, four, and three points. When the desired coefficient alpha was met that fall at least .70 (Tavakol & Dennick, 2011), an inter-item correlation was conducted and the resulting values must not fall below .20 to ensure that items were reasonably homogenous so as to not be isomorphic with each other (Piedmont, 2014). Subsequently, the remaining items were available for mass administration then scale development process involving factor analysis.

Administration of Instrument

The instrument was administered purposively to 379 teachers from the same population. These teachers have previous trainings, conducted, and presented their AR projects in at least a district research congress as identified by the Division Research Office through the 2017 Annual Accomplishment Report (Dedumo, 2017). However, only 267 responded with 20 responses were void because of missing entries to some items but such sample size may be classified desirable and conservative according to Cohen (1969). In fact, 150 observations for exploratory factor analysis and 100 observations for confirmatory factor analysis are sufficient provided that item intercorrelations are practically strong (Guadagnoli & Velicer, 1988; Hair, et al., 2006).

Factor and Cluster Analyses

The remaining 73 items were analyzed using principal component axis factoring to estimate the factorability of the correlation matrix and to determine the number of factors (Kardash & Wallace, 2001). Only factors with eigenvalues greater than 1.0 were included. Subsequently, the resulting number of factors underwent principal components and maximum likelihood procedures through varimax rotation with Kaiser Normalization. Items with criterion loading reaching .5 and above only were included in the final factors based on pragmatic reasoning (Yong & Pearce, 2013). Then, the scores of remaining items were eventually used to perform cluster analysis which segments teachers into homogeneous groups based on the similarity on

their levels of competence in AR and to determine their needs (Yim & Ramdeen, 2015). In this regard, a Mahalanobis Distance (MD) technique was performed as a preliminary test to detect multivariate outliers (Leys, et al., 2018). This test excluded 35 outliers retaining 212 responses. In the hierarchical cluster analysis, Ward's method with Squared Euclidean distance was performed to combine teachers into homogeneous clusters. Eszergár-Kiss and Caesar (2017) contend that the use of Ward's method is based on its property to search proximity matrix, divide teachers into homogeneous subgroups, and form groups in which variance within is reduced (as cited in Cortes, 2018) while squared Euclidean distance is appropriate when the former is requested. A K-means clustering technique was also performed to confirm the number of clusters (Wang & Biddle, 2001) of which the two (2) clusters converged in the seventh iteration. Mean scores and standard deviations per factor between clusters were computed to determine which factor/s they considered of needs. Finally, an independent samples t – Test was performed to examine whether scores on each factor differ between groups or clusters.

Results and Discussion

Reliability Test and Factor Analysis

The test of internal consistency of 73-item scale yields a Cronbach's alpha of .993 with inter-item correlation ranging from .652 to .936. Hence, no item was removed, and they remain equal with that retained after experts' validation. These items were later analyzed using principal component axis factoring and reveals that the sample size is adequate with Kaiser-Meyer-Olkin (KMO) equals to .976, and the Bartlett's Test of Sphericity is significant ($p < .001$), thus, data set was appropriate for factor analysis. There were seven items removed of which one cross loads to two factors and six fell to reach the criterion loading in the same analysis. This retains 66 items creating five factors which eigen values greater than 1 and which explains 77.52% of the variance. The number of factors remains stable after data set were analyzed in principal components and maximum likelihood procedures. The factor loadings, communalities, eigenvalues, and percentage of variance explained for by each factor are all presented in Table 1. Reliability tests were also repeated on the entire scale and within subscales. The Cronbach's alpha ranged from .921 to .990 and .993 for the entire scale, as is shown in the same table.

Factor 1 loads 33 items explaining 68.5 percent of the variance. This factor examines competencies in data collection, interpretation, action, and reflection. The clumping of these items to one factor may indicate that teachers perceived their competence in data collection to

data reflection as interrelated, sequential, or systematic. This implies that when they are aware on the "whats" and "hows" of data collection, they are likely aware also on how they present/report the findings and can recognize or reflect on what improvements are to be done based on the empirical evidences regardless if they are dealing with quantitative or qualitative data. Such result is attested by Peersman (2014) who claims that such competencies or processes have to complement with one another.

Factor 2 clusters items that measure competence in problem identification. This is the only factor by far that remains intact with no items removed since experts' validation, pilot-testing, and factor analysis of the instrument retaining all 19 items but only explains 3.32 percent of the variance. More so, no cross loadings were observed at the given criterion. As the factoring moves to factor 3, the number of items aggregating is decreasing with seven items recorded and it dominantly contained items that specifically assess competence or knowledge of the teacher-researchers on several data collection tools including their respective limitations and associated reliability issues. The percentage of variance explained by this factor accounts 2.55 percent.

Table 1 Summary of item factor loadings

#	Item Statements	F1	F2	F3	F4	F5
	Factor 1. Data Gathering, Interpretation, Action, and Reflection					
54	I can present qualitative data in graphs, charts and networks when necessary.	.763				
53	I can reduce qualitative data in such a way that 'final conclusions' can be drawn and verified.	.754				
55	I can draw and verify conclusion based on data regularities, patterns and explanations.	.728				
45	I can display data collected involving questionnaires or quantifiable information through observations using tables and diagrams.	.719				
57	I can alter one variable at a time to determine which action is responsible for the outcome.*	.718				
47	I can make visual display to break continuous prose for a reader to make sense of the data.	.703				

#	Item Statements	F1	F2	F3	F4	F5
50	I know how to use student profiles and diary entries to create an authentic story of what had happened when the research involves intervention.	.701				
52	I can record changes in the attitudes and behaviours of a small group of children in the form of a case study.	.692				
51	I can present written observation notes as findings in the case of interviews.	.679				
66	I can put data together in a way that the evidence used to generate hypotheses and consequent action is clearly documented.	.677				
59	I can act on the information once I have collected the data and analyzed it.*	.669				
48	I can present the findings in percentage terms when dealing small numbers.	.667				
67	I can put data together in a way that the action taken as a result of the research is monitored.	.660				
44	I know that to represent the data depends on the type of data I will collect.	.657				
43	I can identify themes and patterns in order to be able to present robust evidence for any claims I will make.	.651				
68	I can put data together in a way that the reader finds the research accessible and it resonates with his or her own experience.	.647				
65	I can put data together in a way that the research could be replicated on another occasion.	.640				
58	I can document and collect data on performance while the new intervention is being implemented.*	.639				
49	I can use descriptive statistics in my action research when necessary.	.638				
40	I can create a coherent story from all the data collected.	.627				
69	I can write the report based on my target audience.	.624				
46	I can make visual display for the reader to easily understand information.	.620				

#	Item Statements	F1	F2	F3	F4	F5
56	I can design an action plan according to information from the data collection and review of current literature.*	.611				
20	I can use variety of data collection tools –quantitative, qualitative, or both– for each topic.	.602				
32	I can identify the threats to internal validity of my study.	.592				
42	I am aware that I have to revisit the aims and expectations of the project before analyzing the data.	.588				
39	I can organize data according characteristics to answer research questions.	.584				
26	I can organize data in a way that makes it useful to identify trends and themes.	.566				
61	I can raise questions on the data.*	.561				
63	I consider how I would continue to involve others in this action research process because of its cyclical and collaborative nature.*	.550				
62	I can plan for additional improvements of the study.*	.531				
64	I can observe the results of my action and collect evidence.*	.523				
34	I can seek regularities in data by comparing different participants, settings, and activities to identify recurring results	.503				
	Cronbach's Alpha	***.990***				
	Factor 2. Problem Identification					
7	I can choose topics which are of interest to me before selecting the one.		.733			
3	I can narrow the research topic to put it in a researchable concept.		.698			
2	I can select topics which support my professional development.		.693			
5	I can state research questions in common language.		.686			
8	I can think about the practical implications of carrying out an action research.		.684			
4	I can choose questions which interest my teaching colleagues, counselors, and administrators.		.679			
6	I can develop concise action research questions.		.662			
9	I consider the needed information after selecting a topic.		.656			
1	I undertake a literature search on my proposed topic.		.646			

#	Item Statements	F1	F2	F3	F4	F5
10	I think of how would I go about or conduct the chosen topic.		.645			
15	I can identify what has been done in previous studies and the gaps when choosing a topic.		.628			
11	I ensure that the topic I will be working on is grounded in the realities of the school.		.621			
16	I can describe the problem or situation.		.616			
17	I can make a plan to resolve the problem.		.609			
13	I can select topics which are manageable.		.605			
19	I can state what I will expect to see if the plan works as a research question.		.593			
18	I can turn the problem into research question.		.593			
14	I consider availability of resources when choosing a topic (e.g. time, people, & materials).		.581			
12	I emphasize the importance of data-gathering within the context of action research.		.566			
	Cronbach's Alpha		***.979***			
	Factor 3. Appropriate Use of Data Collection Tools					
28	I am aware on the usefulness and limitations of observations as data collection tool.			.673		
29	I am aware on the usefulness and limitations of surveys as data collection tool.			.671		
30	I am aware on the usefulness and limitations of artefacts as data collection tool.			.637		
27	I am aware on the usefulness and limitations of interview as data collection tool.			.608		
31	I am aware on the usefulness and limitations of assessment data as data collection tool.			.603		
22	I am aware on the usefulness and limitations of log or research journal as data collection tool.			.511		
33	I can acknowledge the issue of reliability involve in different data collection tools.			.504		
	Cronbach's Alpha			***.965***		
	Factor 4. Technology Application					
71	I can use technology when presenting data.				.841	

#	Item Statements	F1	F2	F3	F4	F5
73	I can use technology when doing bibliographical entries.				.790	
70	I can use technology when searching literature.				.778	
72	I can use technology when analysing data.				.755	
	Cronbach's Alpha				***.934***	
	Factor 5. Research Ethics					
36	I know the process involved in obtaining approval from administrators when conducting study or collecting data.					.633
37	I know the ethical concerns associated in conducting action research.					.610
35	I know how to write letter of consent to parents or legal guardians when collecting data.					.570
	Cronbach's Alpha					***.921***
	Total Eigenvalue	49.97	2.42	1.87	1.31	1.03
	Percentage of variance explained	68.5	3.32	2.55	1.79	1.41

Factor 4 groups items measuring competence on the use of technology in terms of literature search, data analysis and presentation, and performing bibliographical entries. In the given framework of conducting AR by Ferrance (2000), these are actually implied. However, the research of Morales, et al. (2016) identified knowledge on technology as one of the constraints in doing research, hence, items measuring such competency were developed. Meanwhile, Factor 5 contains items which measure knowledge on research ethics. This factor loads the least number of items and is considered latent considering that the items were not pre-determined to load as separate factor but only explains 1.41 percent of the variance. Originally, these items were assigned as core parts of data collection in the instrument and as suggested by Efron and Ravid (2013).

Cluster Analysis and Needs-based Assessment

The cluster analysis created two groups of teachers with the following percentage distribution: 52.83 % for cluster 1 (n=113) and 47.17 % for cluster 2 (n=99). The factor or competency mean scores and standard deviations of these clusters are presented in Table 2 to determine teachers' eventual needs through their self-perceived level of competence on AR. For a better visual on the movement of these mean scores between clusters, refer to Figure 2. The independent samples ¬t-test results between clusters are also reflected in the same table to determine whether competency gaps exist.

Table 2 Mean scores, standard deviation, and effect size per factor between clusters to conduct
AR based on their perception

AR Competencies	Cluster 1 (n=113)		Cluster 2 (n=99)		t	p - value	Effect size
	Mean	SD	Mean	SD			
Data Gathering, Interpretation, Action, and Reflection	2.90 [P]	0.08	3.16 [P]	0.09	12.76	.000*	3.10
Problem Identification	3.07 [P]	0.16	3.31 [P]	0.16	4.73	.000*	1.53
Appropriate Use of Data Collection Tools	3.03 [P]	0.04	3.24 [P]	0.09	5.80	.000*	3.10
Application of Technology	3.16 [P]	0.07	3.52 [A]	0.13	4.97	.003*	3.52
Knowledge on Research Ethics	3.22 [P]	0.13	3.61 [A]	0.12	3.74	.020*	3.05

Note. * = $p ≤ .05$; "1" Limited; "2" Basic; "3" Proficient; "4"; Advanced; and, "5" Expert

Cluster 1 (M = 3.07; SD = 0.16) and Cluster 2 (M = 3.31; SD = 0.16) perceived proficient levels when narrowing down a general problem into manageable, compelling, meaningful, and authentic research question along with planning an intervention/resolution to resolve the problem although the latter records significantly higher score, t(35.96) = 4.73, p = .000. Han (2017) argues that teachers' lack of competence to conceptualize a problem or define research questions roots from the complexity of educational problems. This, in effect, constrains them to identify and systematically define an initial idea (Burns, 2010). Further, to develop an idea requires them to do lots of observation, reflection, and brainstorming. Meanwhile, planning a resolution to the problem is also considered an eventual need among this group because no solution or intervention applies to all problems. Each solution has to be planned depending on thecontext specific and has to be grounded on literature.

In terms of competence on data collection, interpretation, action, and reflection, both clusters are classified as proficient. However, results from independent samples t test indicated that score from cluster 2 (M = 3.16; SD = 0.09) is significantly higher than cluster 1 (M = 2.90; SD = .08), t(64.60) = 12.76, p = .000. The effect size (Cohen's d) is 3.10 which exceeds for a large effect size (d = .80) indicating competency gap. Nonetheless, this comptence has to be recalibrated to both clusters regardless on the difference. The figures speak of a perennial problem among teachher-researchers in the province. Even empirical studies from teachers in Turkey and

China encounter the same problem (Akyürek & Afacan, 2018; Zhou, 2012). Polard (2006) contends long before that there is a pressing need to develop these theoretical advances in a variety of different methodologies and approaches which include the competence to conduct practice-based research, analyse secondary data, perform quantitative and statistical analysis, combine qualitative and quantitative data, do international comparative research, synthesize research, and among others because of their relevance to meet new research challenges.
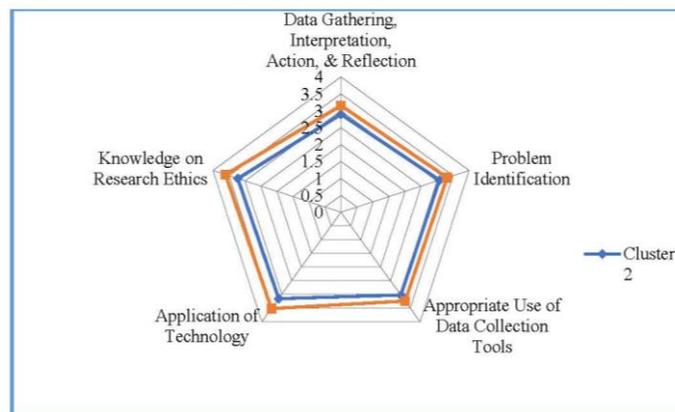
Figure 2 Mean scores of two clusters in five AR competencies

These challenges in factor 1 also translate when using appropriate data collection tools because of their relation. The significant difference between cluster 1 (M = 3.03; SD = 0.04) and cluster 2 (M = 3.24; SD = 0.09), t(8.80) = 5.80, p = .000, favoring the latter does not indicate competence. This level of competence may only indicate mastery from few out of the plethora of research instruments. There are many types data collection tools applicable in AR and each has its respective use/s and limitations. Further, they have to use the instrument based on its value and scientific rigor of the data to be collected as well as the underlying philosophies of the researched problem. They have to consider as well practical dimensions like the research questions, timeframe, and resources and there maybe no approach that may be considered best but a careful mixture of these instruments likely provides the most useful information (Westat, 2002). In this regard, this competency is classified as eventual needs which teachers have to be tooled and/or retooled.

In terms of knowledge and competence to apply ethics in research and associated protocols, the proficiency of teachers in cluster 1 (M = 3.22; SD = 0.13) root from the fact that research practitioners often do not acknowledge that ethics exist despite it has to be considered

even when they study their own context (Zeni, 1998). Cohen, et al., (2007) explains that even an interview is an intrusion into respondents' private lives extracting sensitive information, thus, a high standard of ethical considerations should be maintained. Unfortunately, their lack of knowledge on this factor results to their partial incompetence. Meanwhile, their proficient perception (M = 3.16; SD = 0.07) to use technology in research does not necessarily indicate competence. With the changing landscape of technology, rise of different softwares be it in statistics or bibliographical entries, and rise of different research repositories, they still have to develop this competence. On the contrary, cluster 2 perceived advanced proficiency in application of technology (M = 3.52; SD = 0.13) and knowledge on research ethics (M = 3.61; SD = 0.12), hence, significant difference between levels of competence to both clusters are recorded, t(4.66) = 4.97, p = .003 and t(3.99) = 3.74, p = .020 respectively. This is a good indication that this group of teachers do not regard the two competencies as eventual needs but recalibration is still ideal.

The needs assessment indicates possible misalignment or insufficiency of the training programs to calibrate their teachers in AR. In a Division Memorandum (2017) entitled Research Caravan by District presented by the division research office, the training was only held two days at most with different trainers assigned per district. In a short span of time with expansive breadth of competencies to be developed, the amount of time is unreasonable. It has to be understood that not all grasp the information all at once neither all information are transferred in two days. Yoon, et al. (as cited in Morales, et al., 2016) contend that the minimum hours of PD programs should be 14 or more so that it could have significant effect on student achievement. Further, the training teaches what is to be included on research parts (e.g. statement of the problem) rather than developing their abilities (e.g. to observe, reflect, and develop a question). With the current level of competence that these clusters teacher-researches, it is safe that their competencies still need recalibration. The recalibration or professional development training program can be of two designs as the study provides strong points on how to design teacher PD programs on AR. For cluster one, there is a need of intensive training across five competencies. Meanwhile, the second cluster of teacher-researchers need refinement on their skills in the application of technology and ethics in doing action research. They, however, have the same level of needs in problem identification, data collection, interpretation, action, and reflection, and appropriate use of data collection tools, hence, these teachers likewise need the same intensive

PD with the other cluster of teachers. The purpose of clustering them is to ensure that there will be no waste of resources. Once these teachers are trained under one design of PD, we assume that they are of the same level of needs and competence. This, in effect, will not satisfy their individual needs. This is also the reason why grouping variables (e.g. whether they elementary or secondary teacher) was not used because they may be the same elementary teacher, but they could have different needs. With cluster analysis, we seek similarity of needs as translated in their responses, so we could refrain from using mass training.

Limitation

The instrument does not assess competence of the teacher-researchers on how to develop a resolution/intervention of a problem, but they were asked instead on their level of competence to plan in resolving the problem. This is due to the fact that a resolution (e.g. in the form intervention) depends on the problem being studied and is context specific. Nevertheless, the instrument assess competence of the teacher-researcher to act, change or modify solution applied to the problem on the bases of empirical evidences of the study. This means that they were asked instead whether they can make adjustments to the intervention they applied in resolving the problem.

Conclusion

The result of the study reveals that there are five major competencies that teachers have to develop when conducting AR, namely: data management, problem conceptualization and resolution planning, appropriate use of data collection tools, application of technology, and research ethics. Their competence to each competency or factor appears relative to their trainings but has to be aligned according to needs to calibrate or recalibrate these teachers. Thus, as the division will pursue in improving research competencies of their teachers, they might consider looking at the indices per factor or competence as these will guide them what to contain in their training programs.

Recommendation

Findings of the study suggest that although majority of the teachers perceived their level of competencies across five factors of AR competence at median level, they still need calibration or recalibration through PD programs. However, these have to anchored based on

the needs they have as revealed by the assessment and a teacher has to be classified on a certain cluster that he/she best fitted. The coordinator organizing the PD on AR should refrain from practicing mass training as it treats teachers as homogenous in terms of competence and needs when in fact the needs assessment reveals they are not.

Acknowledgment

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