

**CREDESCENCE AND EFFECTS OF TRIANGULATION IN MIXED METHOD
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ABSTRACT

This study described and examined teachers' perceptions on the credence and effects of triangulation in mixed method researches relative to education. It employed a descriptive correlational research design which was participated by 200 purposively drawn public secondary school teachers in the Philippines. Results showed that teachers highly perceived the reduction of bias as credence of triangulation in mixed method educational research while they also perceived that triangulation method supported the validity and understanding of their research work. In addition, the teachers highly perceived the effects of triangulation method in terms of impact, applicability of findings and theory development. Conclusively, as teachers put high perceptions on the credibility of triangulation in reducing bias, they also tend to perceive a greater impact of triangulation in their mixed method educational researches. Hence, a proposed intervention program was developed through technical training and workshop on the proper use of triangulation in mixed method educational researches.

Keywords:

Credence, effects, triangulation, mixed method, educational, researches

INTRODUCTION

Researchers specially those who are novice researches commonly used common research methods such as pure quantitative or pure qualitative researches. Writing a research work is a laborious process because researchers opt to scientifically observe the conditions or situations circulating the system under their field of work or discipline. In this line, researchers view that the conduct of research study is not an easy task since it involved critical processes and intricate procedures that shall be followed in order to build credibility and reliability of a research work. Following line, most number of researchers specially teacher-researchers who are inclined in the administration of a research study pertaining to education, put less emphasis on the use of mixed method researches. Apparently, researches applying mixed method are valued as one of the most difficult research work because the methods to be used are both quantitative and qualitative method combined in a single research study. While teachers find the use of mixed method research, selection of respondents is also one its critical aspects since accuracy and strength of the data to be gathered shall at all times be considered in order to impose strong credence in a research work. Researches which used mixed method commonly adhered to multiple processes and procedures because of the combinatory aspects of quantitative and qualitative methods. Also, data to be gathered or have been gathered in mixed method researches somewhat pose concerns because of the self-serving concern by which single participants are only tapped and selected. In this regard, triangulation comes in as one of the critical aspect to gather powerful data that can help the researchers to pursue strong research reliability and accuracy because the data will be drawn not only from a single group but to the multiple group of participants or respondents in a single research. Notably, triangulation method is used to increase the credibility and validity of research findings. As coined, credibility refers to the trustworthiness and how believable a

research work is while validity is concerned with the extent to which a research accurately reflects or evaluates the concept or ideas being investigated. In a nutshell, triangulation refers to the multiple methods or data sources in quantitative and qualitative studies or mixed method studies so as to develop a comprehensive understanding of conditions, test theories or validate a model. Apparently, triangulation in line with data sources focused mainly on gathering responses from multiple groups of respondents or participants in a single research. This triangulation method does not only concur the methodological choices of teacher-researchers. Based on the collective observations of the researchers, teacher-researchers in their respective schools and division offices are not commonly acquainted or put less emphasis on the use of triangulation method specifically under the context of data gathering aspect. In addition, the researchers observed that teacher-researchers are only utilizing single method with single group of respondents. Accordingly, reasons behind the selection of single method and single group of respondents by their known teacher-researchers in which they observed consistently, is that using the same poses significant and challenging tasks where teacher-researchers are also expected to fulfill their instructional duties and functions. In other words, when teacher-researches opted to use triangulation under mixed method studies, then they find it very challenging. In this regard, while researchers observed such condition, this study assessed the credence and effects of triangulation in mixed method research as perceived by teacher-researchers who have already gained experiences or exposed in using triangulation in mixed method research.

Documenting prevalence mixed methods in a broad selection of research topics included three novel approaches on research methods such as the expansion of feasible options, enhancement on the value of mixed method and practical techniques by which research value is increased (Gibson, 2016). Apparently, triangulation is a measurement technique often used by surveyors to locate an object in space by relying on two known points. The alternative perspectives on the use of triangulation is its usefulness as a dialectical process whose goals seek a more in-depth nuanced understanding on research findings and clarifying disparate results by placing them in dialogue with one another (Mertens & Hesse-Biber, 2012). All methods individually are flawed but these limitations can be mitigated through mixed methods research which combined methodologies to provide reliable and accurate findings. Implications of convergent triangulation, holistic triangulation and convergent-holistic triangulation are effective when reliability and credibility of a research work is desired (Turner et al., 2016). On one hand, the effect of the weaknesses of qualitative research on the findings and conclusions can be minimized through the application of triangulation (Donkoh & Mensah, 2023). Hence, triangulation is best applied when conducting generative and pragmatic research strategy used to engage among diverse groups or data sources (Archibald, 2015).

Consequently, the researchers find strong research gap as the previous studies cited focused only on the effects of triangulation in single research method. They also examined that studies cited failed to put strong emphasis on the credence and effects of triangulation method moreso, as applied in mixed method educational researches. Along this line, this study described and examined teachers' perceptions on the credence and effects of triangulation in mixed method educational researches. Thus, this study supported Sustainable Development Goals 4 focusing on Quality Education as this study may provide logical baseline in understanding the importance of triangulation in mixed method educational researches. Apart from this, it also proposed an intervention program which may help teachers develop or sustain their competence in using triangulation method for mixed method educational researches.

OBJECTIVES

This study described and examined teachers' perceptions on the credence and effects of triangulation in mixed method researches relative to education. Specifically, this study answered the following questions:

1. How may teachers perceived the credence of triangulation in mixed method educational researches in terms of:
 - 1.1 validity;
 - 1.2 understanding;
 - 1.3 reduction of bias?
2. How may teachers perceived the effects of using triangulation in mixed method educational researches in terms of:
 - 2.1 applicability of findings;
 - 2.2 impact; and
 - 2.3 theory development?

3. Is there any significant relationship between teachers' perceptions on the credence of triangulation and their perceptions on the effects of using triangulation method in mixed method educational researches?
4. Based from the findings, what proposed intervention program may be crafted?

Hypothesis

The study hypothesized that there would be no significant relationship between the teachers' perceptions on the credence of triangulation and their perceptions on the effects in mixed method educational researches.

METHODOLOGY

The study used a descriptive correlational research in order to describe and examine the credence and effects of triangulation in mixed method researches relative to education. Apparently, the study used a researcher-made survey-questionnaire which contained two (2) parts. For part 1, it contained items relating to the teachers' perceptions on the credence of triangulation in mixed method educational researches while part 2 contained items relating to teachers' perceptions on the effects of using triangulation in mixed method educational researches. The developed survey-questionnaire used a 4-Likert Scale such as: 4-Highly Perceived, 3-Perceived, 2-Not Perceived and 1-Highly Not Perceived. Also, the researcher-made survey-questionnaire underwent validation and internal consistency measure. For the validation process, the developed survey-questionnaire was validated by three (3) research experts who were working as part-time Graduate School professors at the time when this study was conducted. Thereafter, the researcher-made survey-questionnaire was subjected to pilot test which was participated by 30 non-included respondents. Employing a Cronbach Alpha statistics, the developed survey-questionnaire yielded a .985 results which meant that the items contained in the survey questionnaire were highly acceptable. On the other hand, the researcher selected the participation of 200 teachers among the selected public secondary schools in the Philippines who have already gained experiences in using triangulation method in mixed method educational researches. They were given a Google Form links to fill the survey-questionnaire. In addition, they were also provided with access links to ensure that their responses were recorded. Hence, the researchers carefully organized the raw data gathered and subjected the same for statistical computation. As such, frequency, mean and general weighted mean were used in order to describe teachers' perceptions on the credence and effects of using triangulation in mixed method educational researches. Meanwhile, Pearson R was used in order to examine if there would be a significant relationship between the teachers' perceptions on the credence of triangulation and their perceptions on the effects in mixed method educational researches. The researchers provided digital copy of informed consent which was sent to the respondents' email addresses which signified their voluntary participation in this independent research study. Thus, the researchers observed and complied with the ethical protocols in conducting a research study such as provision of informed consent, conduct of short orientation and proper storage and deletion of the gathered raw data.

RESULTS AND DISCUSSION

Writing and completing educational researches are both critical aspects to obtain significant contributions in the knowledge development in the field of education as well as provide substantial empirical evidences relating to education and research. One of the most critical considerations which is technical in nature, the understanding and use of triangulation in researches like mixed method educational researches. As such, triangulation was a vital yet critical approach in mixed methods educational researches that enabled teachers to create scientifically founded findings and conclusions forming their research works' reliability and accuracy.

1. **Teachers' Perceptions on the Credence of Triangulation in Mixed Method Educational Researches.** The results show that reduction of bias (wm=3.92) obtained the highest mean score, described as highly perceived while understanding gained a mean score of 3.21, described as perceived. Also, validity obtained a mean score of 3.19, described as perceived. The results showed that teachers highly perceived the credence of triangulation in terms of reduction of bias. This suggested that they highly perceived that triangulation effectively minimized biases that could arise from relying on a single method only. In addition, the high level of perceptions expressed by teachers implied that they viewed the importance of triangulation in conducting mixed method educational researches.

Conversely, the results on understanding and validity which both obtained closely relative mean scores implied that while teachers recognized these dimensions as credence in using triangulation in mixed method researches, they do not significantly viewed the same level of conviction as extracted under bias reduction variable. Apparently, this also suggested that teachers may also feel less certain on the greater validity and understanding aspects in using triangulation method in mixed method researches. Results of the study supported the study of Tonkin-Crine et al. (2015) which revealed that triangulation method as applied in mixed methods were less certain to produce significant validity on the findings and conclusions. Similar study claimed that triangulation method immensely influenced the reduction of bias in any research work when it was applied properly. The study implicated that there was a strong need for further research and develop technical training which should emphasize the proper use of triangulation in mixed method educational researches.

- 2. Teachers' Perceptions on the Effects of Using Triangulation in Mixed Method Educational Researches.** The results showed that impact gained the highest mean score of 3.96, described as highly perceived while applicability of findings obtained a mean score of 3.78, described as highly perceived. Then, theory development variable gained a mean score of 3.61, described as highly perceived. The findings revealed that teachers highly perceived the effects of triangulation method in mixed method relative to education in terms of impact. This suggested that teachers highly believed that triangulation method significantly could influence research outcomes and enhanced the overall effectiveness of educational studies. In addition, the results implied that teachers placed significant emphasis on triangulation as a mean to produce more insightful and actionable results for educational system. Apparently, the results on applicability of findings, it implied that teachers highly perceived the effects of triangulation as they found it more relevant and could be effectively applied in their daily practices. Following such result, teachers also highly perceived that use of triangulation in mixed method educational researches enabled them to formulate educational theories as triangulation method helped them extract more actual, grounded and realistic findings. Results of the study supported the study of Naidu-Valentine (2025) where he showed that triangulation method in mixed method researches helped increased research rigor, validity and reliability. Similar study also discussed that triangulation improved data accuracy. The study implicated that teachers' practical skills and competence in using triangulation method should be deepened based on the current trends in research writing relative to education. Also, administration of consistent technical workshop should be done so as to help teachers develop more founded theories as results of their research works using triangulation method.
- 3. Significant Relationship Between Teachers' Perceptions on the Credence of Triangulation and Their Perceptions on the Effects of Triangulation in Mixed Method Educational Researches.** The results showed that teachers' perceptions on the credence of triangulation in terms of reduction of bias and their perceptions on the effects of triangulation in terms of impact was positively correlated ($r=.498$). Thus, the null hypothesis that there would be no significant relationship between the teachers' perceptions on the credence of triangulation and their perceptions on the effects in mixed method educational researches was rejected. The positive correlation coefficient suggested a moderate to strong relationship indicating that as teachers perceived a highly credibility of triangulation in reducing bias, they also tend to perceive a greater impact of triangulation in their mixed method educational researches. Thus, the results implied that teachers who were more confident in using triangulation were better placed to appreciate its practical benefits. Results of the study supported the study of Semu (2011) which showed that triangulation method helped researchers to create impactful researches and provide more reliable and accurate findings and conclusions. Hence, the study implicated that teachers should be properly guided and taught of a deeper application and implementation of triangulation method through series of trainings and workshops.
- 4. Proposed Intervention Program.** This study proposed a training workshop which aimed to improve teachers' understanding of triangulation method in mixed method educational researches. The program also aimed to educate teachers on the principles and benefits of the method, facilitate discussions and collaborations and enable them to apply their acquired technical knowledge in using triangulation

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method. The program components included: (1) workshops and training sessions, (2) resource materials development, (3) collaborative research projects and (4) presentation of research projects.

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CONCLUSION

Teachers highly perceived the reduction of bias as credence of triangulation in mixed method educational research while they also perceived that triangulation method supported the validity and understanding of their research work. In addition, the teachers highly perceived the effects of triangulation method in terms of impact, applicability of findings and theory development. Conclusively, as teachers put high perceptions on the credibility of triangulation in reducing bias, they also tend to perceive a greater impact of triangulation in their mixed method educational researches. Hence, a proposed intervention program was developed through technical training and workshop on the proper use of triangulation in mixed method educational researches.

REFERENCES

- [1] Archibald, M. M. (2015). Investigator triangulation. *Journal of Mixed Methods Research*, 10(3), 228–250. <https://doi.org/10.1177/1558689815570092>
- [2] Donkoh, S. (2023). Application of triangulation in qualitative research. *Journal of Applied Biotechnology & Bioengineering*, 10(1), 6–9. <https://doi.org/10.15406/jabb.2023.10.00319>
- [3] Gibson, C. B. (2016). Elaboration, generalization, triangulation, and interpretation. *Organizational Research Methods*, 20(2), 193–223. <https://doi.org/10.1177/1094428116639133>
- [4] Mertens, D. M., & Hesse-Biber, S. (2012). Triangulation and mixed methods research. *Journal of Mixed Methods Research*, 6(2), 75–79. <https://doi.org/10.1177/1558689812437100>
- [5] Naidu-Valentine, R. (2025). Triangulation and mixed methods. *Introducing Research Methodology*. <https://doi.org/10.4135/9781036235628.n9>
- [6] Semu, L. L. (2011). Triangulation and mixed method research design in practice: The Malawi case study on the interplay of state policy, family structure and land on women and children's well-being. *The International Journal of Interdisciplinary Social Sciences: Annual Review*, 6(1), 57–72. <https://doi.org/10.18848/1833-1882/cgp/v06i01/51976>
- [7] Tonkin-Crine, S., Anthierens, S., Hood, K., Yardley, L., Cals, J. W., Francis, N. A., Coenen, S., van der Velden, A. W., Godycki-Cwirko, M., Llor, C., Butler, C. C., Verheij, T. J., Goossens, H., & Little, P. (2015). Discrepancies between qualitative and quantitative evaluation of randomised controlled trial results: Achieving clarity through mixed methods triangulation. *Implementation Science*, 11(1). <https://doi.org/10.1186/s13012-016-0436-0>
- [8] Turner, S. F., Cardinal, L. B., & Burton, R. M. (2016). Research design for mixed methods. *Organizational Research Methods*, 20(2), 243–267. <https://doi.org/10.1177/1094428115610808>