MMED: GEOGRAPHICAL KNOWLEDGE ENHANCEMENT FOR GRADE 7 STUDENTS AT REINA MERCEDES VOCATIONAL SCHOOL

BERMUDEZ, W. C. B.

Faculty of the College of Education, Ifugao State University Potia Campus, Ifugao, Philippines.
e-mail: bermudez.wmc[at]pnu.edu,ph

(Received 06th December 2023; accepted 30th January 2024)

Abstract. This action research investigates the effectiveness of the MMED (Map Me Educational Booklet) in enhancing the geographical knowledge of Grade 7 students at Reina Mercedes Vocational and Industrial School. Grounded in the interdisciplinary nature of social science, particularly the symbiotic relationship between geography and history, the study addresses challenges in Araling Panlipunan, revealing disinterest due to a lack of relevance and interactive learning experiences. Inspired by research on teaching aids and supplementary materials, the researcher developed the "Map Me Educational Booklet" as an evidence-based intervention. Employing a Quasi-Experimental design, the study randomly assigned students to control and experimental groups. Results indicate a substantial improvement in both groups, with the experimental group displaying a more significant enhancement. Statistical analyses support the effectiveness of the booklet, emphasizing its positive impact on student performance. The study contributes to existing literature by aligning with real-world studies and providing a practical, evidence-based platform. Utilizing mean scores, variance analysis, t-tests, and Cohen's D, the research establishes the significance of the intervention. The findings support the booklet's role in active learning and highlight its potential for educational practices, emphasizing the need for innovative tools to address challenges in geography education. The study recommends the implementation of the "Map Me Educational Booklet" as a valuable supplement to enhance geographical knowledge, fostering implications for teaching and learning modalities.
Keywords: *Geographical education, Southeast Asean Countries, educational intervention, instruction, spatial knowledge*

Introduction

Social science, an expansive academic branch encompassing disciplines like anthropology, economics, political science, psychology, and sociology, explores the intricacies of human group life (Nisbet and Greenfeld, 2023). Within this realm, geography acts as a crucial link between human and physical science, delving into the study of Earth's features, inhabitants, and phenomena (Kedron and Holler, 2022). Numerous empirical studies support the interdisciplinary nature of social science and emphasize the significance of geography in understanding societal dynamics. In Philippine Basic Education, the Social Studies curriculum, known as Araling Panlipunan, aims to facilitate a comprehensive understanding of history. Studies, such as the one conducted by Santos (2021), highlight the symbiotic relationship between historical and geographical knowledge. Santos found that students who integrated geographical perspectives into their historical analyses demonstrated a deeper understanding of historical events and their broader contexts. Geography, is the study of Earth's features and regional variations, has been subject to empirical investigations demonstrating its impact on students' cognitive development. For instance, in a study examined the effectiveness of interactive engagement in introductory physics classes. Although not directly related to geography, the study emphasized the importance of

interactive and engaging teaching methods in enhancing students' comprehension, a principle applicable to geography education.

However, challenges persist in the perception of Araling Panlipunan, especially in terms of student engagement. Empirical evidence from a study by Aguimlod et al. (2023) revealed the the lack of relevance and interactive learning experiences contributed to disinterest. This finding underscores the need for innovative educational tools, such as the proposed "Map Me Educational Booklet," to address the identified issues and enhance student engagement. Drawing inspiration from empirical studies which emphasized the pivotal role of teaching aids in fostering active participation and engagement in the learning process, the "Map Me Educational Booklet" aims to provide a tangible solution to the challenges identified in geography education. Additionally, in certain research highlighted the positive impact of supplementary educational materials on students' academic performance, reinforcing the potential efficacy of the proposed intervention. Recognizing the empirical evidence supporting the connection between geography and historical understanding, as well as the effectiveness of interactive teaching methods and supplementary materials, the researcher advocate for the implementation of the "Map Me Educational Booklet" as an evidence-based intervention. A pre-test, informed by existing literature and empirical findings, was administered to 20 Grade 7 students using a researcher-developed questionnaire, aiming to gauge their baseline knowledge on fourth-quarter topics. The primary contribution of this study lies not only in the conceptualization and formulation of the "Map Me" booklet but also in its alignment with empirical research on educational interventions. By building on real-world studies, this research serves as a practical and evidence-based platform for subsequent investigations into the positive impact of instructional materials on geography education.

Materials and Methods

The Quasi-Experimental research design was used, specifically the Pre-test-Post-test Only Design wherein the respondents were randomly assigned to either the experimental group or control group. Both groups were pretested for the independent variable (Map Me Educational Booklet). The experimental group receives the treatment, and both groups are post-tested to examine the effects of manipulating the independent variable on the dependent variable (improvement of the basic knowledge of students on the Southeast Asian countries). The respondents of this study were the Grade 7 students of Reina Mercedes Vocational and Industrial School. One section (Section Sampaguita) served as the experimental group and the other (Section Ilang-Ilang) served as the control group. The researcher randomly chooses which one is the experimental and control group. There were 10 participants for each group which in total, 20 participants chosen by means of randomization.

The researcher made use of an assessment tool before, during, and after the introduction of the intervention to measure its effectiveness. In the Pre-experimental stage, the researcher administered a pre-test in the basic facts of Southeast Asian geography. This is to assess the performance of the control group and experimental group before the implementation of the intervention. The pre-test was based on the learning competency indicated in the Curriculum Guide of Araling Panlipunan 7 with the integration of geography as a discipline in Social Sciences. For the experimental stage, the researcher introduced the booklet and mentored the participants in the

experimental group. This was done weekly to monitor their progress. During this stage, the researcher also conducted interview and observation to the participants. For the control group, the researcher gave them conventional materials/strategy such as module, books, maps, and discussion. This method was done on the control group about the basic facts on the geography of Southeast Asian countries. After the intervention, the researcher gave a post-test parallel to the pre-test administered prior to the intervention.

To analyze the effects of the Map Me Educational Booklet on the mastery of the Grade 7 students, the researcher made use of mean scores and percentage. The scores of both pre-test and post-test were taken and these data was tallied and statistically treated using the mean and standard deviation. t-test was used to find out the significant difference in the scores of the control group and experimental group before and after the intervention. Kuder- Richardson 20 was used to test the tool's consistency and Cronbach Alpha for item analysis. Cohen's D was also used to determine the effect of the intervention to the mastery of the Grade 7 students.

Results and Discussion

The descriptive analysis of the Map Me Educational Booklet's impact on a control group is elucidated through the examination of pretest and post-test mean scores. Prior to the intervention, the control group exhibited an average pretest score of 11.3 (*Table 1*). Following exposure to the educational booklet, the post-test mean score notably increased to 15.2. This substantial rise suggests a positive influence of the Map Me Educational Booklet on the participants' performance. Furthermore, the pretest and post-test variances, measuring the spread of scores, provide additional insights. The pretest variance is calculated at 2.01, indicating a certain degree of variability in the pre-intervention scores. In contrast, the post-test variance decreases to 1.07, suggesting a reduction in variability after the educational intervention. While these findings imply an overall improvement in performance, the determination of statistical significance would necessitate further inferential analyses.

Table 1. *Descriotive analysis of Map Me EducationalBooklet in terms of pre-test and post-test mean score of the control group.*

Category	Pre-test	Post-test
Mean	11.3	15.2
Variance	2.01	1.07

In *Table 2*, the descriptive analysis focuses on the pretest and post-test mean scores of the experimental group subjected to the Map Me Educational Booklet. The pretest mean score for the experimental group is 11.4, indicating their initial performance level before the educational intervention. Following the intervention, the post-test mean score remarkably increases to 17.1, suggesting a substantial improvement in performance. Additionally, the variance values provide insights into the spread or variability of the scores within the experimental group. The pretest variance is reported as 1.38, signifying a certain degree of variability in the pre-intervention scores. In contrast, the post-test variance decreases to 0.54, indicating a reduction in variability after exposure to the Map Me Educational Booklet. This decrease in variance suggests a more consistent and possibly improved performance across the experimental group. The experimental group, like the control group, demonstrates an increase in mean scores

from pretest to post-test. The lower post-test variance further suggests a more consistent response to the educational intervention. As with the control group, it would be advisable to conduct statistical tests to determine the significance of these findings and to make robust conclusions about the effectiveness of the Map Me Educational Booklet in the experimental group.

***Table 2**. Descriotive analysis of Map Me EducationalBooklet in terms of pre-test and post-test mean score of the experimental group.*

Category	Pre-test	Post-test
Mean	11.4	17.1
Variance	1.38	0.54

According to Davidson (2020), it is said that the main advantage of using booklets nowadays, is that, students allow the teachers to continue teaching in a seamless manner, promotes remote learning that provides a level and equitable playing field for the students and it ensures better classroom organization whereas pupils have all the notes and resources they need in certain lesson. The calculated t-statistic of -0.17 falls within the acceptance region of ±2.11 at a 5% alpha level, leading to the acceptance of the null hypothesis. This implies no significant mean difference between the pretest results of the control and experimental groups, indicating an equivalent academic level in Southeast Asia geography initially. The marginal difference in variances (2.01 for the control group and 1.38 for the experimental group) suggests diversity in both groups, possibly reflective of varying IQ levels and academic capacities. Adhering to principles of diversity in research participation, the study considered factors such as color, ethnicity, gender, and age, avoiding bias in participant selection. This random selection is crucial as bias in quantitative research can compromise data validity and reliability, distorting research conclusions. The statistical evidence in *Table 3* substantiates the unbiased participant selection process.

***Table 3**. Inferential analysis of Map Me Educational Booklet when grouped into control and experimental in term of pretest results.*

t-test: Two sample assuming unequal variances	Control	Experimental
Mean	11.30	11.40
Variance	2.01	1.38
Observations	10.00	10.00
Hypothesized mean differnece	0.00	
df	17.00	
t-stat	-0.17	

The t-statistic has -4.73 lies outside the acceptance region of ±2.12 at 5% alpha level. Hence, the null hypothesis should be rejected which is there is no significant mean difference between the post-test results of the control group and experimental group. The study should accept the alternative hypothesis which is there is significant mean difference between the post-test results of the control group and experimental group. This implies that the experimental group has a higher score due to the Map Me Educational Booklet tool. Hence, the tool is effective and efficient in improving geographical knowledge on Southeast Asian countries (*Table 4*). The t-statistic has -6.45 lies outside the acceptance region of ±2.26 at 5% alpha level. Hence, the null hypothesis should be rejected which is there is no significant mean difference between

the pretest and post test results of the control group. The study should accept the alternative hypothesis which is there is significant mean difference between the pretest and post test results of the control group. This implies that the conventional materials available online and materials came from DepEd including the teaching activities employed by the teacher helped to improve the scores of the control group (*Table 5*).

Table 4. *Inferential analysis of Map Me Educational Booklet when grouped into control and experimental in term of post-test results..*

t-test: Two sample assuming unequal variances	Control	Experimental
Mean	15.2	17.1
Variance	1.07	0.54
Observations	10	10
Hypothesized mean differnece	0.00	
df	16	
t-stat	-4.73	

Table 5. *Inferential analysis ofMap Me Educational Booklet in terms of pretest and post-test of the control group.*

t-test: Paired two sample for mean	Pre-test	Post-test
Mean	11.3	15.2
Variance	2.01	1.07
Observations	10	10
Pearson correlation	-0.20	
Hypothesized mean differnece	0.00	
df	9	
t-stat	-6.45	

According to Chick (2020), the use of booklets is not only for replacement of textbook rather it relies on teachers' expertise. Hence, a good booklet is considered as a live document, it must not define the curriculum instead it is a tool to be used in delivering it. Also, the use of booklet can easily become a textbook/workbook hybrid. Moreover, stated by (Uygarer and Uzunboylu, 2017) in their book "An Investigation of the Digital Teaching Book Compared to Traditional Books in Distance Education of Teacher Education Programs" that the participants view the use of electronic books has function on them being successful and interactive in their education and it increases student level of attention and permanent learning. The t-statistic has -11.50 lies outside the acceptance region of ±2.26 at 5% alpha level. Hence, the null hypothesis should be rejected which is there is no significant mean difference between the pretest and post test results of the experimental group. The study should accept the alternative hypothesis which is there is significant mean difference between the pretest and post test results of the experimental group. This implies that the Map Me Educational Booklet and the teaching activities employed by the teacher helped to improve the scores of the control group (*Table 6*).

Table 6. *Inferential analysis of Map Me Educational Booklet in terms of pretest and post-test of the experimental group.*

Category	Control	Experimental
Mean	11.4	17.1
Variance	1.38	0.54
Observations	10	10

Pearson correlation	-0.31
Hypothesized mean differnece	0.00
df	9
t-stat	-11.50
P(T<=t) two tail	1.10
t Critical two tail	2.26

This study suggests that students who attempt to solve geographical question were more successful in using such tools because it enhances the process of learning in the field of geography. Furthermore, the findings of this study which indicates that students who used geographical facts (Map Me Booklet) stood better in the post-test phase, thus showed significant improvement. The result showed that the mean of post-test is markedly higher than the pre-test and the level of significance is highly noticeable. Cohen's D value between the pretest and post-test of the experimental group has 1.60 with "large" adjectival description. This means that the average of the pretest as contrasted with the average of the post-test indicate that has large effect size. The large separation between the two mean (mean of the pretest and mean of the post-test) is due to the Map Me Educational Booklet (*Table 7*).

***Table 7**. Descriptive analysis of Map Me Educational Booklet in terms of pretest and post-test of the experimental group.*

Category	Mean	SD	n
Pre-test	11.4	1.17	10
Post-test	17.1	0.74	10
M2-M1	-	5.7	-
Pooled SD	-	3.55	-
Cohen's D	1.60	Large	Large

Conclusion

The Map Me Educational Booklet significantly improves geographical knowledge in both control and experimental groups. Statistical analyses reveal a substantial increase in mean scores post-intervention, with the experimental group showing a more significant improvement. Findings align with literature, supporting the effectiveness of well-designed booklets. Overall, the Map Me Educational Booklet proves to be an efficient tool for enhancing geographical knowledge among the Grade 7 Students of Reina Mercedes Vocational and Industrial School, with potential implications for educational practices and be used to supplement the institution's teaching-learning modalities.

Acknowledgement

This research is self- funded.

Conflict of interest

The authors confirm that there is no conflict of interest involve with any parties in this research study.

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