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MICROLEARNING MECHANISM AND STUDENT LEARNING OUTCOMES IN TEACHING ARALING PANLIPUNAN

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ABSTRACT:

Educators have identified non-traditional teaching ways to improve learning outcomes in Social Studies education. The study aimed to evaluate innovative teaching interventions considering the evolving education system, necessitating adjustments in pedagogical approaches to align with modern and flexible student learning styles, including the implementation of microlearning methodologies. This led the researcher to study and determine the effect of the microlearning mechanisms on student learning outcomes of Grade 10 students in a public high school in San Pablo City. Eighty students participated, of which forty students were taught using the two microlearning mechanisms which is infographic and podcast, and the other forty were exposed to other two microlearning mechanisms which are e-learning and video. Inferential statistics showed a significant difference in student learning outcomes based on the mean pre-test and post-test of both groups, implying improved performance after instruction. Comparison of the level of student learning outcomes based on test results after intervention and the integration of the microlearning mechanism showed no significant differences in both groups. Both Group A and Group B exhibited substantial enhancements in their knowledge and attitudes after the intervention. The paired samples t-test indicated significant improvements in knowledge and favorable changes in students' attitudes in both groups. Only Group A demonstrated a statistically significant development in their skills, while Group B did not show a substantial improvement in this regard. Group A may have retained more knowledge due to visual attractiveness of infographics and the auditory engagement provided by podcasts. Group B's learning improved, however, infographics and podcasts appeared to be more effective than videos and e-learning modality in fostering deeper understanding and proficiency.

Keywords: microlearning, knowledge, skills, attitudes, experimental

Introduction:

The Philippine educational system saw more modifications after gaining its independence. Regardless of socioeconomic background, the government enacted changes with the goal of ensuring that all Filipinos could access education. As to the 1987 Philippine Constitution, "the State shall take appropriate steps to make such education accessible to all and shall protect and promote the right of all citizens to quality education at all levels" (Bai, 2023). While the Philippines has implemented educational reforms like the K-12 program, challenges remain in ensuring these reforms are effectively executed at the grassroots level. Moreover, the pandemic exacerbated existing challenges in the education sector, with prolonged school closures leading to significant learning losses.

Additionally, the PISA results serve as a wake-up call for the Philippine education system, emphasizing the need for comprehensive reforms that address both quality and equity in education. In the subjects of science, math, and reading, Filipino students performed lower than the OECD norm (Ilizaliturri, 2023). According to studies, knowledge may be learnt more rapidly when built in a relevant context, connections are remembered for longer thus, ideas are generated (Tony & Dowen, 2007). The social science classroom needs to use techniques that encourage children's creativity, aesthetics, and critical thinking. They should also be given the opportunity to make connections between the past and present and comprehend the social changes that are occurring. More audio-visual resources, such as images, charts, and maps, should be used in instruction (Boyer, 2004).

Microlearning combines two elements: "micro," which means microscopic or minuscule; and "learning," which refers to the act of acquiring knowledge or abilities. Microlearning refers to presenting brief, bite-sized information to learners. These parts are intended to be simple for better understanding likewise it is accessible. (Samala, 2023). Microlearning is a versatile approach to education and training that involves delivering content in small, focused chunks. It can target specific skills or knowledge areas, providing just-in-time learning that helps individuals quickly acquire and apply new skills. It can also be used to reinforce key concepts and ensure retention (Torgerson, 2020)

With the recent advancement in technology and utilization of the Internet, a survey conducted by Microsoft revealed a decrease in the average human attention span from 12 to 8 seconds (McSpadden, 2015), shorter than a goldfish. Recent developments have been utilized to address this issue, microlearning is one of them. As per Leong (2020) small chunks of the learning content can enable learners to access them more easily in specific moments and conditions of the day. Considering the typical human attention span due to its emphasis on quick learning, microlearning is becoming

more and more significant. This corroborates (Jomah, 2016) assertion that when lessons are presented concisely, pupils remain actively engaged and adhere to the class plan and timeframe until its conclusion.

The Araling Panlipunan curriculum is a social studies program based on the aspirations of the Education for All 2015 initiative and the K-12 Philippine Basic Education Curriculum Framework. These aimed to cultivate learners who are functionally literate and to shape Filipinos equipped with 21stcentury skills. The search for effective pedagogical methods to improve learning outcomes in Social Studies among learners has prompted educators to uncover non-traditional techniques that go beyond traditional teaching techniques. In addition, it is exceedingly difficult to have a learner sit down in one area and continuously absorb instructional content and remain concentrated on a topic for hours upon hours in today's fast-paced environment full of distractions and online stimulation.

Furthermore, various studies have found out that students perceived Araling Panlipunan as boring and not essential in comparison with other subjects taught in school. According to (Reader, 2007) regrettably, students perceive Araling Panlipunan as a tedious subject. It primarily addresses history, politics, economics, and society. Due to the objective nature of the issue, it must be presented clearly and comprehensively. Consequently, educators struggle to engage students and must render the material pertinent to their lives. In the study conducted by (Pangilinan, 2021) students don't think that Araling Panlipunan is an essential or engaging subject. A similar view can also be found in other studies such as (Milo, 2015) that some students found boring because they perceived the subject as impractical to their personal life. In addition, (Miguel et.al, 2015) students find Araling Panlipunan a boring subject because it requires a lot of memorizations. Also, with the study conducted by (Pangilinan, 2021), they examined the attitudes of students towards Araling Panlipunan and the result shows that students do not consider Araling Panlipunan as essential since teachers based solely on textbooks and deliver on lectures. These results concerned teachers, specifically those who are handling Araling Panlipunan to make students more engaged.

In this sense, a study that appeared in the Journal of Educational Psychology showed that people learn and function better when they have access to brief, interesting content that they can consume at their own pace rather than a large amount of complex knowledge all at once (Andrew G., Scott H., 1999). Microlearning is the process of giving students brief, digestible knowledge (Samala, 2023). In addition, it is any educational material that can be used independently or in conjunction with other learning activities, like simulations, e-learning modules, and instructor-led classes (Torgerson, 2020).

Meanwhile, according to statistics, the Philippines was placed 77th out of all nations and did poorer than the 81 countries' average record, as determined by a global student assessment carried out by the Organization for students aged 15 the Organization for Economic Cooperation and Development (OECD). The results showed that the Philippines' arithmetic performance fell short of the OECD average, science and reading. Average results in the three categories of reading, math, and science—have not changed, even though these were averaged results from 2022. Additionally, PISA evaluates pupils' 15-year-old reading, science, and math proficiency. Because students in Grade 10 are typically between the ages of 15 and 16 (Stamford et al. School), the assessment results can be used in the study. The assessments evaluate students' critical thinking, communication skills, and problem-solving abilities. This indicates the effectiveness of schools in equipping pupils for success in the real world and in the future.

Additionally, Araling Panlipunan had the lowest mean percentage score of all the topics evaluated in the National Achievement Test (NAT) results from 2016 to 2018 (DepEd, 2018).

With the recent reading assessment, it was revealed that almost 50% of students at Dolores National High School falls in the category of 'frustration'. 143 students in Filipino subject and 227 students in English subject was categorized as frustration. This result shows the lack of comprehension among students.

Consequently, this study is initiated in the hope of considering that the education setting is changing and that teaching methods need to be realigned with the modern and flexible learning preferences of today's students, such as applying microlearning mechanisms. Traditional teaching methods, characterized by rote memorization and algorithmic procedures, have shown limitations in engaging students and developing their critical thinking skills.

This study aims to investigate the effect of the microlearning mechanism on the different level of learning outcomes in Araling Panlipunan of Grade 10 students in Dolores National High School for the school year 2024-2025. The specific objective is to determine the level of learning outcomes of Grade 10 students exposed to applying different microlearning approaches. By doing so, the study seeks to contribute to the understanding of how the microlearning mechanism can be effectively used to improve the learning outcomes of Grade 10 students in Araling Panlipunan.

According to Torgerson & Iannone (2020) there are common formats for microlearning. These are e-learning modules, videos, infographics and podcasts. These were used as independent variables in the study. On the other hand, the Department of Education proposed that students need to be assessed on the domains of knowledge, skills and attitudes. These are the dependent variables in the study.

The research paradigm, such as the microlearning mechanism describes the relationship between the independent variables. The concept of Torgerson & Iannone is used to identify the independent variables. The study's dependent variables are the students' learning outcomes, which may or may not be affected by the independent variables. The dependent variables are based on various authors with concepts of learning outcomes led by the Department of Education.

The following is the conceptual framework of the study, which uses the relationship paradigm between independent and dependent variables.

Research Paradigm

The research paradigm shows the relationship between the microlearning mechanism and the student learning outcomes in Araling Panlipunan.

Independent Variables	 Dependent Variables				
MICROLEARNING MECHANISM	STUDENT LEARNING				
 e-learning modules videos infographics podcast 	 OUTCOMES • Knowledge • Skills • Attitudes				

Statement of the Problem

The findings of this study determine the effect of the microlearning mechanism on the student learning outcomes of Grade 10 students in Araling Panlipunan in Dolores National High School for the school year 2024 - 2025.

Specifically, this study aims to answer the following questions:

- What is the level of student learning outcomes of Grade-10 students in both groups based on the mean pretest and post-test, in terms of: knowledge; skills; and attitudes?
- Is there a significant difference between the pretest and post-test mean score of student learning outcomes of Grade-10 students in Group A?
- Is there a significant difference between the pretest and post-test mean score of student learning outcomes of Grade-10 students in Group B?
- Is there a significant difference between the pretest and post-test mean score of student learning outcomes of Grade-10 students from Group A and Group B?
- Is there a significant difference between the mean pre-test of student learning outcomes of Grade-10 students in Group A and Group B?
- Is there a significant difference between the mean post-test of student learning outcomes of Grade-10 students in Group A and Group B?

Research Hypotheses

The study formulated the following hypotheses.

- There is no significant difference between the pretest and post-test mean scores of learning outcomes of Grade-10 students in Group A.
- There is no significant difference between the pretest and post-test mean scores of learning outcomes of Grade-10 students in Group B.
- There is no significant difference between the pretest and post-test mean scores of learning outcomes of Grade-10 students from Group A and Group B.
- There is no significant difference between the mean pretest of learning outcomes of Grade-10 students in Group A and Group B.
- There is no significant difference between the mean post-test of student learning outcomes of Grade-10 students in Group A and Group B.

Methodology:

Research Design

The researcher systematically utilized an experimental pretest and post-test design to analyze and decipher the causal processes between microlearning mechanisms and the learning outcomes of Grade 10 learners. An experimental design is a traditional approach to conducting quantitative research (Creswell, 2015). In this study, outcomes will be measured before and after an intervention or treatment is implemented. By administering pretests and post-tests, the research is strategically positioned to capture the initial status quo of learning outcomes among Grade 10 students and subsequently measure the specific impact of microlearning interventions. This sequential and strategic arrangement, in line with ethical considerations, provides a robust foundation for drawing evidence-based conclusions regarding the effectiveness of microlearning tools in the context of Grade 10 Araling Panlipunan education.

Respondents of the Study

The respondents of the study were eighty Grade Ten students at Dolores National High School. Forty students were included in Group A and the other forty students were in Group B. The respondents were the integral contributors to exploring microlearning influences on learning outcomes, amplifying the significance of their individual experiences and collective insights in shaping the research narrative.

Population and Sampling Technique

Employing purposive sampling this research embraced a critical approach by implementing the above-mentioned sampling technique to Grade 10 students at Dolores National High School.

Creswell and Plano Clark believe that this entails discovering and choosing individuals or groups with significant expertise or experience about a phenomena of interest (2011).

Research Instrument

The researcher developed four lesson exemplars for use over a period of four weeks. The exemplars familiarized the pupils with various microlearning technologies via a learning activity sheet. The strategies intended to enhance pupils' learning results.

To assess learning outcomes, a pretest and post-test in the form of learning activity sheets will be prepared. The pretest and post-test included 30 item questions about the lessons discussed in the lesson exemplars. The research instruments was subjected to a content validation by three Araling Panlipunan teachers, professors and researcher's thesis advisor, whose field of specialization is Social Studies, for corrections, revisions and suggestions. Suggestions was considered by the researcher to improve the instruments. Before the actual implementation of the instruments to the respondents, a pilot testing was made to a different set of students. If the result of the pilot test suggested a very good and excellent reliability then, the instruments were ready for implementation.

Data Gathering Procedure

The researcher, in a significant step towards ensuring the credibility of the study, obtained permission from the Dean of Graduate Studies and Applied Research. This is because the assessment tools that were used in the study were deemed valid and reliable, further bolstering the study's legitimacy. Before administering the test and instructions, the researcher personally requested permission from the school division Superintendent (SDS) through a letter. Upon the SDS's approval, a letter for the principal and respondents was prepared. After the principal's approval to conduct the study, the research instruments were distributed. The researcher gathered the necessary information for the study by conducting a pretest on those chosen grade ten student. Two sections were used. The first section was Group A, and the other section was Group B. Both sections were employed by microlearning intervention with different strategies.

The lecture exemplars were conducted after the pretest. The first exemplar for Group A involves the utilization of infographic which included teacher-created and adapted infographics then the next exemplar used adapted podcast from the Internet. Whereas for Group B, the lesson exemplar involved videos followed by the e-learning modules through a learning management system. Microlearning mechanisms were introduced to activities and instruction that lead to the understanding of gender issues. After implementing the exemplars, both groups were given exercises through learning activity sheets to measure the students' learning outcomes. The lesson discussion for both groups lasted for five (5) weeks, two weeks were allotted for the delivery of each exemplar for each lesson exemplar for Group A and B. On the last day of the fifth week, a post-test was administered. Eventually, the researcher tabulated the results from each question, which helped analyze the problem of the study. After retrieving each test, the researcher processed the data. The respondents' answers were thoroughly categorized. Quantitative data was computed and double-checked to ensure its accuracy. These measures helped the researcher obtain the desired data and consequent analyses.

Statistical Treatment of Data

The statistical analysis in this study focused on a detailed examination of the pretest and post-test phases. Descriptive statistics, inferential statistics, were used to quantify the influence of microlearning mechanism on the learning outcomes of Grade 10 students at Dolores National High School.

The first stage consisted of independently applying descriptive statistics to the scores obtained before and after the assessments. Quantitative measures such as means, standard deviations, and ranges succinctly capture the core patterns and fluctuations of each phase. This enables a lucid comprehension of the original learning outcome environment and the following observable modifications. The statistical significance of observed changes between the pretest and post-test scores was quantified using inferential statistics, namely paired-sample t-tests and independent t-tests. This analytical methodology enables a meticulous evaluation of the statistical significance of the changes, therefore offering strong proof of the influence of microlearning mechanisms on student learning outcomes. Inferential statistics were applied to determine the magnitude of the difference between the two groups (Fritz, 2012). This gave insights into the practical relevance of microlearning as intervention.

Fusing descriptive statistics and inferential statistics enabled a comprehensive interpretation of the pretest and post-test data. Findings were not solely confined to statistical significance but were contextualized within the specific changes observed in learning outcome dimensions. This integrated approach ensures a thorough and refined understanding of the effectiveness of microlearning mechanism in shaping Grade 10 students' learning outcomes. To maintain the integrity and credibility of the analyses, validity and reliability checks were performed throughout the statistical treatment. The inclusion of these checks enhanced the credibility of the results, confirming the validity of the statistical methods utilized specifically for the pretest and post-test evaluations.

Results

Pre-test and Post-test Scores of Group A and Group B

The level of student learning outcomes of Grade 10 students in Group A and Group B based on the mean pretest and post-test in terms of the different microlearning mechanism such as infographics and podcast for Group A and video and e-learning module for Group B as to knowledge, skills and attitudes are presented below. Both groups were assessed through a Student Learning Outcomes Pre- and Post-Tests. Results are verbally interpreted as

Beginning (0-2), Developing (3-4), Approaching Proficiency (5-6) and Proficient (7-8) and Advanced (9-10). The test scores are reflected in mean and in their standard deviation.

GROUP A	Pre-test				Post-test				
	Mean	SD	VI	Mean	SD	VI			
Knowledge	3.70	1.38	Developing	6.38	2.77	Approaching Proficiency			
Skills	3.60	1.75	Developing	4.92	1.99	Developing			
Attitudes	5.92	2.20	Approaching Proficiency	8.18	2.05	Proficient			
Overall	13.22	4.05	Approaching Proficiency	19.48	5.62	Proficient			

Table 1. Mean Pre-test and Post-test Scores of Group A

Legend: 0-2 (Beginning); 3-4 (Developing); 5-6 (Approaching Proficiency); 7-8 (Proficient); 9-10 (Advanced). Legend (Averall): 0-6 (Beginning); 7-12 (Developing); 13-18 (Approaching Proficiency); 19-24 (Proficient); 25-30 (Advanced).

GROUP B	Pre-test			Post-test				
	Mean	SD	VI	Mean	SD	VI		
Knowledge	3.48	1.96	Developing	6.05	2.47	Approaching Proficiency		
Skills	4.13	2.13	Developing	4.42	2.27	Developing		
Attitudes	5.78	2.57	Approaching Proficiency	7.85	1.93	Proficient		
Overall	13.38	5.34	Approaching Proficiency	18.32	5.46	Approaching Proficiency		

Table 2. Mean Pre-test and Post-test Scores of Group B

Legend: 0-2 (Beginning); 3-4 (Developing); 5-6 (Approaching Proficiency); 7-8 (Proficient); 9-10 (Advanced).

Legend (Averall): 0-6 (Beginning); 7-12 (Developing); 13-18 (Approaching Proficiency); 19-24 (Proficient); 25-30 (Advanced).

Table 2 depicts the level of student learning outcomes for Group B in terms of knowledge, skills and attitudes is described from beginning to advanced. The pre-test mean score in knowledge was 3.48 (SD = 1.96), categorized as Developing. The results suggested that Group B students had deficiencies in comprehending fundamental ideas, struggling to recognize basic notions about gender and sexuality prior to the intervention's implementation. After the implementation of microlearning mechanism such as videos and e-learning module, the post-test mean increased to 6.05 (SD = 2.47), moving the group to the Approaching Proficiency level. This shows a notable improvement in their knowledge acquisition.

A multimedia medium, videos use moving pictures—often with sound—to inform, narrative, or teach ideas. Group B utilized videos as microlearning mechanism which then resulted in an increased post-test scores of learners in knowledge dimension. Moreover, videos may be paused, returned, and rewatched by students, hence enabling self-paced and active learning. According to dual-coding theory, information is processed more efficiently when conveyed through both verbal and visual modalities just like in videos.

Paired Samples T-Test Results for Group A

The paired samples t-test was conducted to assess whether the improvements in Group A's post-test scores were statistically significant.

GROUP A	Pre-test	Pre-test		Post-test			Sig
	Mean	SD	Mean	SD	t	df	(2-tailed)
Knowledge	3.70	1.38	6.38	2.77	-6.40	-2.67	.001
Skills	3.60	1.75	4.92	1.99	-3.85	-1.32	.001
Attitudes	5.92	2.20	8.18	2.05	-6.75	-2.25	.001
Overall	13.22	4.05	19.48	5.62	-10.05	-6.25	.001

Table 3. Paired Samples T-Test Results for Group A

Note. H_a μ Measure 1 - Measure 2 \neq 0

The paired samples t-test results for Group A revealed statistically significant improvements across all three learning dimensions—knowledge, skills, and attitudes—as well as in the overall scores.

Paired Samples T-Test Results for Group B

The paired samples t-test was conducted to determine whether the differences between the pre-test and post-test scores of Group B were statistically significant across the knowledge, skills, and attitudes dimensions.

GROUP A	Pre-test	_	Post-test				Sig
	Mean	SD	Mean	SD	t	df	(2-tailed)
Knowledge	3.48	1.96	6.05	2.47	-7.306	39.0	.001
Skills	4.13	2.13	4.42	2.27	-0.845	39.0	0.403
Attitudes	5.78	2.57	7.85	1.93	-5.903	39.0	.001
Overall	13.38	5.34	18.32	5.46	-7.996	39.0	.001

Table 4. Paired Samples T-Test Results for Group B

Note. H_a μ Measure 1 - Measure 2 \neq 0

The paired samples t-test results for Group B reveal statistically significant improvements in knowledge and attitudes, but no significant enhancement in skills.

Comparison of Pre-test Scores Between Group A and Group B

An independent samples t-test was conducted to determine whether there was a statistically significant difference in the pre-test scores between Group A and Group B. This analysis assessed the effectiveness of the intervention by comparing the two groups' overall learning outcomes.

	Group A		Group B				Sig
	Mean	SD	Mean	SD	t	df	(2-tailed)
Knowledge	3.70	1.38	3.48	1.96	0.598	39.0	0.553
Skills	3.60	1.75	4.13	2.13	-1.328	39.0	0.192
Attitudes	5.92	2.20	5.78	2.57	0.297	39.0	0.768
Overall	13.22	4.05	13.38	5.34	-0.157	39.0	0.876

Table 5. Independent Samples T-Test for Pre-test Comparison

Note. $H_a \; \mu$ Measure 1 - Measure 2 $\neq 0$

The results of the independent samples t-test show that there is no statistically significant difference between Group A and Group B's pre-test scores in terms of knowledge, skills, attitudes, or total scores. All the p-values are higher than the 0.05 significance level, which means that the strategy had similar effects on learning in both groups.

Comparison of Post-test Scores Between Group A and Group B

A t-test for independent samples was employed to determine if a statistically significant difference existed between the pre-test results of Group A and Group B. This study evaluated the efficacy of the training by assessing the overall learning outcomes of the two groups.

Table 6. Independent Samples T-Test for Post-test Comparison

	Group A		Group B				Sig
	Mean	SD	Mean	SD	t	df	(2-tailed)
Knowledge	6.38	2.77	6.05	2.47	0.579	39.0	0.566
Skills	4.92	1.99	4.42	2.27	1.081	39.0	0.287
Attitudes	8.18	2.05	7.85	1.93	0.820	39.0	0.417
Overall	19.48	5.63	18.32	5.46	1.008	39.0	0.320

Note. H_a μ Measure 1 - Measure 2 \neq 0

The independent samples t-test results reveal that there is no statistically significant difference between the post-test scores of Group A and Group B across all learning dimensions—knowledge, skills, attitudes, and overall scores. The p-values in all areas are greater than the 0.05 significance threshold, indicating that the intervention produced comparable learning outcomes in both groups.

Conclusion

The study examined the impact of microlearning mechanisms on the learning outcomes of Grade 10 students at Dolores National High School for the 2024-2025 school year. Results showed significant improvements in knowledge, skills, and attitudes for both groups. For Group A, the pre-test mean score in knowledge was Developing, and the post-test mean increased significantly to 6.38, moving the group to the Approaching Proficiency level. In the skills dimension, the pre-test mean was 3.60, and the post-test mean increased to 4.92, reflecting moderate improvement. The attitudes domain showed the most substantial improvement, reaching the Proficient level. For Group B, the pre-test mean score in knowledge was Developing, and the post-test mean was 4.42, suggesting limited impact on enhancing skills. Group B showed noticeable growth in the attitudes dimension, but their overall scores remained at the Approaching Proficiency level.

The study found that both Group A and Group B showed significant improvements in their knowledge and attitudes following an intervention. However, Group A showed a statistically significant enhancement in their skills, suggesting that the intervention was more effective in strengthening students' practical competencies. Both groups showed comparable post-test scores across knowledge, skills, and attitudes, indicating that both methods led to parallel academic progress.

Group B did not show significant improvement in the skills dimension, suggesting a limitation in the intervention's effectiveness in fostering skill-based learning. The substantial improvement in students' attitudes suggests that the intervention was successful in promoting greater confidence, engagement, and positive learning behaviors, contributing to overall academic growth.

To further enhance the effectiveness of future interventions, recommendations include extending the curriculum to develop critical thinking and problem-solving abilities, using infographics and podcasts as microlearning mechanisms, conducting longitudinal assessments to measure the long-term effectiveness of the interventions, using differentiated instructional methods to address diverse learning needs, and integrating more interactive learning methods like project-based tasks, collaborative activities, and simulations to enhance both knowledge and skills.

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