

TEACHING STYLES AND APPROACHES FOR ENHANCED NUMERACY SKILLS OF THE INTERMEDIATE LEARNERS IN BOTOLAN DISTRICT, ZAMBALES, PHILIPPINES

Author's Name: Cresilda D. Soberano¹

Affiliation:

1. Villar Integrated School, Botolan, Zambales, Philippines.

Corresponding Author Name & E-Mail: Cresilda D. Soberano,

cresildadsoberano@gmail.com

ABSTRACT

The study highlights the vital role teachers play in enhancing students' numeracy skills, emphasizing the importance of effective mathematical teaching techniques. It focuses on the use of various mathematical formulas and the development of logical thinking through numeracy. Employing a descriptive research design, the study surveyed 105 randomly selected teacherrespondents to assess their teaching styles and approaches. Findings revealed that repetitive, lecture, cooperative, interactive, and inductive teaching methods were considered highly effective in improving students' numeracy skills. Based on these results, the study recommends the immediate implementation of an intervention program provided funding allows. It encourages Mathematics teachers to continuously explore and adopt the best teaching strategies, with a call for the dissemination and validation of these practices. Additionally, it stresses the importance of allocating adequate resources for instructional materials to support the adoption of diverse teaching approaches for effective Mathematics instruction.

Keywords: repetitive style, lecture style, cooperative approach, interactive approach, and inductive approach



INTRODUCTION

Mathematics plays a predominant role in everyday life. Learning mathematics helps learners think analytically and have better reasoning abilities. It helps them develop their lifelong learning skills to solve problems in life. Academically speaking, mathematics is a subject that many learners either love or hate. It is hated by learners who do not find figures interesting, especially those learners who are more into social sciences (Prayoga & Abraham, 2017). The importance of numeracy has been widely acknowledged as the foundation for lifelong learning, which must be harnessed from an early age to support young people's success in the wider curriculum and other activities beyond the classroom (Akhter, Akhtar, and Abaidullah, 2015).

The world around us is changing rapidly. Global education trends are influencing the policies of the developing countries. Mathematics must sustain its existence for the development of the country. It is therefore valued at the time of the policy-making process. The course curriculum should be designed with a modern approach meeting with the challenges of the 21st century education trends (Gul, Khan & Akhtar, 2020), there has been an increase in research on mathematics education. Mathematics has complex abstract concepts, complicated calculations, and unique terminology makes it difficult for the learners to tackle this subject. Some learners face difficulties due to teaching methods (Gul & Rafique, 2017).

In a study carried out in Makoni District of Manicaland Province in Zimbabwe, it was found that not all mathematics learners benefited from their teachers' teaching styles and approaches due to mismatches between teachers' teaching styles and approaches and learning styles of the learners (Mangwende & Maharaj, 2018). Balachandran, (2015) claimed that some factors influence teaching styles and approaches. Those elements are related to the teacher, student, surroundings, and the lesson. According to Gul & Reba, (2017), pupils must enhance their learning skills and knowledge. They need to face and survive in the global education scenario. The teaching methods should be transformed from traditional mode to new pedagogies, in order to sustain the learner's abilities. Learner's academic performance in school is seemingly determined by his or her learning modes of learning (Dayon, 2018). When teachers work together to improve their practice, learners learn more. This simple yet powerful idea is at the heart of effective schools. Collaboration builds collective responsibility for constantly improving teaching practice and so the learning of the learners. The challenge for teachers and schools is to develop a shared understanding of what excellent practice looks like. While it will not look exactly the same in every classroom, there are some instructional practices that evidence suggests work well in most. Sarode, (2018) defines teaching styles and approaches as methods to generalize plan for a lesson(s) which includes structure desired learner behavior in terms of goals of instructions and an outline of planned tactics necessary to implement the methods.



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The teaching styles and approaches are the pattern of belief, knowledge, performance, and behavior of teachers when they are teaching, according to Bakar, (2016). A study done by Ing, Webb, Franke, Turrou, Wong, Shin, and Fernandez, (2015) in elementary school mathematics, explored the different teaching practices that encourage learners' participation. Actual footage recording show learners expounded their thoughts, conferred with their classmates and how teachers promoted interaction. They found out that learners' achievement relies on teaching styles, approaches, and learner engagement. To improve learners knowledge of mathematics, educators should engage in mathematical practices that help learners understand mathematics (Lincoln,Tran, and Powell, 2019). One of the most significant challenges in learning is for individuals to take responsibility for their own learning. When learners take responsibility for their own learning, they attribute meaning to the process of learning, leading to effective learning (Nzesei, 2015). Teachers need to understand the process of individual learning. In the learning process, individuals are interacting with the environment, i.e., uniquely processing the information and requiring a unique environment for learning. Thus, addressing the challenge in facilitating learning conditions while organizing such interactions should be taken into consideration to help individuals to optimize their learning (Sighn and Yadav, 2017).

Hidalgo and Ibarrola, (2020) stated that repetition is essential for the lasting memorization of the studied material. According to Klaiss, (2017), repetition of using flashcards or other uses of quick facts is supposed to help learners memorize the facts. Some interventions that have been used to increase addition and subtraction mathematics fact fluency are having learners practice with flashcards, and having learners participate in addition and subtraction themed small group games. These are the interventions that will be used with this group of learners to determine which intervention improves mathematics fact fluency the most. The study conducted by Petropovlov, Jaworski, Potari and Zachariades, (2020), lecture-type teaching has been largely criticized especially because it positions learners in a passive role while it does not prioritize interaction between teachers and learners during the learning process. Indeed, during lecture-type teaching, learners barely contribute to the lecture and the communication is mostly done one-way, from the teacher to the learners (Viirman, 2021). Cooperative learning is a simple strategy that allows learners to work and solve a problem with a pair or a group (Razak, Yassin and Maasum, 2018). When a teacher has provided the basic instruction, s/he will then split the class into pairs or groups to work on problems (Chan & Idris, 2017). It is meaningful in helping the learners develop metacognition or the knowledge of how they learn and improve the transferring of the information's learned in one context to another. According to the study of Jaleel and Premachandran, (2016), in an inductive approach where metacognition takes place and enables the learners to understand and control their own cognitive performance. It is becoming an audience of own intellectual performance. According to Codington, (2018), no two learners are alike, and the way every person learns



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will vary. Our brains are all unique, and our experiences all contribute to the different ways we learn. Demonstration method of teaching is another form of traditional classroom strategy that requires step by step process of solving math problems (Ramadhan & Surya, 2017). It focuses on achieving psychomotor and cognitive objectives. Granberg & Olsson, (2015) studied about providing special attention to creative mathematical reasoning would prepare students for solving non-routine mathematical problems and lifelong learning. They also stressed that students often focus on what is familiar to them and on what they can easily recall at a superficial level, avoiding the use of creative mathematical reasoning. Norqvist, (2018) believed that it is imperative to foster and improve learners' creative reasoning, but in the same time, it is the most difficult task for educators. Engagement is actually multifaceted for it can be seen in different but interrelated perspectives. The study provides valuable insights for enhancing numeracy skills among intermediate learners. Teachers can adopt effective strategies to improve instruction, while learners gain confidence and actively engage in mathematics. Administrators and curriculum planners can design targeted programs based on the findings, and stakeholders, including parents and the community, are encouraged to support education collaboratively.

RESEARCH PROBLEM

A descriptive study to assess the teaching styles and approaches to enhance numeracy skills of the intermediate learners of Public Elementary Schools in Botolan District.

OBJECTIVES:

> To describe the teaching styles and approaches used by teachers such as : Repetitive Style; Lecture Style; Cooperative Style; Interactive Approach; and Inductive Approach.

 \succ To assess the significant difference on the perception towards teaching styles and approaches when the teachers' respondents are grouped according to profile variables.

 \succ To assess the significant difference on the perception towards dimensions on the teaching styles and approaches as cited in objective number 3.

 \succ To assess the significant relationship among the teaching styles and approaches used by the teachers and the level of numeracy skills of learners.

MATERIAL AND METHODS

This study employed descriptive research with the survey questionnaire as the main research instrument. The respondents of the research study were the mathematics teachers in Public Schools of Botolan District, Zone 2, Division of Zambales, Philippines.



A survey questionnaire was used in gathering data of the teaching styles and approaches for enhanced numeracy skills of the intermediate learners in Botolan District, Zambales, Philippines.

The survey questionnaire has three (3) parts.

First part of the survey checklist focused on the profile of the teacher –respondents which included the age, gender, length in service, area of specialization and highest educational attainment.

The second part assessed the level of numeracy skills based on the average mathematics grades of the learners in the first quarter of the school year 2022-2023.

The third part assessed the teaching styles and approaches of Mathematics teacher respondents to enhance numeracy skills of the learners in terms of repetitive style, lecture style, cooperative style, interactive approach, and inductive approach. This part had 10 items in repetitive styles, 10 items in lecture styles, 10 items in cooperative styles, 10 items in interactive approach, 10 items in inductive approach with a total of 50 items. The teachers answered from the scale ranging from 4 (Always), 3 (Often), 2 (Seldom) and 1 (Never).

To test for the reliability and validity of the instrument, the questions were pilot tested to 15 teachers who were not respondents of the study. After the data had been consolidated, it was subjected to Kronbach's analysis by a Statistician and the questions were found acceptable. After making the final draft of the survey checklist, the researcher sought permission/approval of the Schools Division Superintendent, Division of Zambales, through letters signed by the Director of Graduate School to administer the survey questionnaire to the respondents. After securing the endorsement, the researcher personally distributed the instrument to the participants on March 2023. The objectives of the study were explained to the participants, for them to consider and gain better understanding of the objectives of the research study. The respondents' answers were treated confidential. The instruments were collected immediately. The statistical treatment of this study utilized descriptive statistical tools such as percentage, frequency counts and mean. The inferential statistics was ANOVA and Pearson r. All the data obtained in the instrument were tallied, tabulated, analyzed and interpreted accordingly.

RESULTS

Table 1 shows the Table on the Assessment of the Teacher-respondents on the Level of Teaching Styles and Approaches to Enhance Numeracy Skills of Intermediate Learners. Clearly gleaned for the results on the equal assessment for meaningful learning among the teaching approaches as to cooperative and inductive approaches.



Table 1. Table on the Assessment of the Teacher-respondents on the Level of Teaching Styles and

Approaches to Enhance Numeracy	y Skills of Intermediate Learners
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	Teaching Styles and Approaches	Overall Weighted Mean	Qualitative Interpretation	Rank
1	Repetitive Style	3.37	Always	4
2	Lecture Style	3.29	Always	5
3	Cooperative Style	3.47	Always	1.5
4	Interactive Approach	3.43	Always	3
5	Inductive Approach	3.47	Always	1.5
	Grand Mean	3.41	Always	

Table 2 shows the Analysis of Variance to test difference on the dimension towards the Teaching Styles and Approaches of teachers as to Repetitive Style, Lecture Style, Cooperative Style, Interactive Approach, and Inductive Approach respectively. There is significant difference on the on the dimension towards the Teaching Styles and Approaches of teachers as to Repetitive Style, Lecture Style, Cooperative Style, Cooperative Style, Interactive Approach respectively manifested on the computed Sig. or P-value of 0.038 which is lower than 0.05 alpha level of significance, therefore the null hypothesis is rejected.

 Table 2.Analysis of Variance to test difference on the dimension towards the Teaching Styles and

 Approaches of teachers

Courses of M	22	46	NAC	Г	Cia	Decision	
Sources of Variations			ai	IVIS	r	Sig.	Decision
*Repetitive	Between	2,303	4	0.576	2.552	0.038	
Style	Groups			0.070			
*Lecture Style	Within	447 244	520	0.000			
*Cooperative	Groups	117.344	520	0.226			Reject Ho
Style							Significant
*Interactive							olgimeente
Approach	Total	119.647	524				
*Inductive							
Approach							
Sources of Va	ariations	SS	df	MS	F	Sig.	Decision
Sources of Va *Repetitive	ariations Between	SS	df	MS	F	Sig.	Decision
Sources of Va *Repetitive Style	ariations Between Groups	SS 2.303	df 4	MS 0.576	F 2.552	Sig. 0.038	Decision
Sources of Va *Repetitive Style *Lecture Style	ariations Between Groups Within	SS 2.303	df 4	MS 0.576	F 2.552	Sig. 0.038	Decision
Sources of Va *Repetitive Style *Lecture Style *Cooperative	Between Groups Within Groups	SS 2.303 117.344	df 4 520	MS 0.576 0.226	F 2.552	Sig. 0.038	Decision
Sources of Va *Repetitive Style *Lecture Style *Cooperative Style	ariations Between Groups Within Groups	SS 2.303 117.344	df 4 520	MS 0.576 0.226	F 2.552	Sig. 0.038	Decision Reject Ho
Sources of Va *Repetitive Style *Lecture Style *Cooperative Style *Interactive	Between Groups Within Groups	SS 2.303 117.344	df 4 520	MS 0.576 0.226	F 2.552	Sig. 0.038	Decision Reject Ho Significant
Sources of Va *Repetitive Style *Lecture Style *Cooperative Style *Interactive Approach	ariations Between Groups Within Groups Total	SS 2.303 117.344 119.647	df 4 520 524	MS 0.576 0.226	F 2.552	Sig. 0.038	Decision Reject Ho Significant
Sources of Va *Repetitive Style *Lecture Style *Cooperative Style *Interactive Approach *Inductive	Between Groups Within Groups Total	SS 2.303 117.344 119.647	df 4 520 524	MS 0.576 0.226	F 2.552	Sig. 0.038	Decision Reject Ho Significant

Table 3 shows the Pearson Product Moment Coefficient of Correlation to test relationship between the Numeracy Skills of Learners and the Teaching Styles and Approaches. There is positive low correlation



between the numeracy skills of learners and the teaching styles and approaches of teachers manifested on the computed Pearson Product Moment Coefficient of Correlation value of 0.373**. The computed Sig. (2-tailed) value of 0.000 which is lower than 0.05 alpha level of significance, therefore the null hypothesis is rejected.

Table 3

Pearson Product Moment Coefficient of Correlation to test relationship between the Numeracy Skills of Learners and the Teaching Styles and Approaches

Sources o	f Correlations	Numeracy Skills	Teaching Styles and Approaches		
	Pearson Correlation	1	0.373**		
Numeracy Skills	Sig. (2-tailed)		0.000		
	Ν	105	105		
Teaching Styles	Pearson Correlation	0.373**	1		
and Approaches	Sig. (2-tailed)	0.000			
I I II III II	Ν	105	105		
**. Correlation is significant at the 0.01 level (2-tailed).					

DISCUSSION

The finding reveals that the teacher-respondent is a female in her early adulthood, major in mathematics with units in masteral degree and had been in the service for several years. In terms of the level of numeracy skills the learners are numerates. The teachers always use the repetitive styles, lecture styles, cooperative styles, interactive approach and inductive approach. There is significant difference in the perception of respondents towards repetitive styles, lecture styles, cooperative styles, interactive approach when grouped according to highest educational attainment. There is significant difference in the perception of respondents towards repetitive styles, interactive approach and inductive approach and inductive approach and inductive approach stowards dimension on the teaching styles as to repetitive styles, lecture styles, cooperative styles, interactive approach and inductive approach and inductive approach and inductive approach styles, interactive approach and inductive approach towards dimension on the teaching styles as to repetitive styles, lecture styles, cooperative styles, interactive approach and inductive approach and inductive approach respectively. There is a positive low correlation between the numeracy skills in learning and the teaching styles and approaches used by the teachers.

CONCLUSION

This study brings to light the need to encourage mathematics teachers to continue searching for the best teaching approaches and have it be lobbied for dissemination, confirmation and validation of results for effective teaching and learning process in Mathematics. School heads are encouraged to provide the allocation of funds for instructional materials for teachers' use in Mathematics.



- Akhter, N. Akhtar, M. & Abaidullah, M., (2015). The perception of high school mathematics problem solving Teaching methods in mathematics education.Bulletin of education and research. Vol. 37, No. 1 pp. 1-23.
- Bakar, A., (2016). Digital Classroom: An Innovative Teaching and Learning technique for Gifted Learners Using ICT. Creative Education, Vol.7 No.1. https://www.scirp.org/(S(351jmbntvnsjt1aadkposzje))/reference/ReferencesPapers.aspx?ReferenceID=1 658980.
- Chan, L., & Idris, N., (2017). Cooperative Learning in Mathematics Education. DOI: 10.6007/IJARBSS/v7-i3/2757. URL: http://dx.doi.org/10.6007/IJARBSS/v7-i3/2757.
- Dayon, C., (2018). Learning Styles and Academic Performance of Students in English 3. Vol. 2 · November 2018 PRINT ISSN: 2619-8428 • ONLINE ISSN: 2619-8436.
- Granberg, C., and Olsson, J., (2015). ICT-supported problem solving and collaborative creative reasoning: Exploring linear functions using dynamic mathematics software. The Journal of Mathematical Behavior 37, DOI:10.1016/j.jmathb.2014.11.001.
- Gul, R., Khan, S. S., Mazhar, S., & Tahir, T. (2020). Influence of Logical and Spatial Intelligence on Teaching Pedagogies of Secondary School Teachers. Humanities & Social Sciences Reviews, 8(6), 01-09. https://doi.org/10.18510/hssr.2020.861.
- Gul, R., Kanwal, S., & Khan, S. S. (2020). Preferences of the Teachers in Employing Revised Blooms Taxonomy in their Instructions. Sir Syed Journal of Education & Social Research, 3(2), 258-266. Doi: 139- Article Text-1546-2-10- 20200702.
- Gul, R., Khan, S. S., & Akhtar, S. (2020). Organizational Politics as Antecedent of Stress in Public Sector Universities of Khyber Pakhtunkhwa. International Review of Management and Business Research, 9(2), 150-161. Doi:10.30543/9-2(2020).
- 9.
- Gul, R., & Rafique, M. (2017). Teachers Preferred Approaches towards Multiple Intelligence Teaching: Enhanced Prospects for Teaching Strategies. Journal of Research & Reflections in Education (JRRE), 11(2). pp 197-203. http://www.ue.edu.pk/jrre.
- Gul, R., and Reba, A., (2017). A Study of Multiple Intelligence and Social Profiles of Secondary School Teachers, Peshawar. J. Appl. Environ. Biol. Sci., 7(6)226-235, 2017 © 2017, TextRoad Publication ISSN: 2090-4274.
- Ibarrola, A., (2020). Studies in Second Language Learning and Teaching. Department of English Studies, Faculty of Pedagogy and Fine Arts, Adam Mickiewicz University, Kalisz, Universidad Pública de Navarra, Spain.

- Ing, Webb, Franke, Turrou, Wong, Shin, and Fernandez (2015). Student Engagement with Other's Mathematical Idea. Elementary School Journal, v116n1 p16-148 Sep 2015.
- 14. Jepsen, D., Varhegyi, M., Teo, S., (2015). The Association between Learning Styles and Perception of Teaching Quality. Emerald Group Publishing Limited, Howard House, Wagon Lane, Bingley, West Yorkshire, BD16 1WA, UK.
- 15. Klaiss, J., (2017). Engaging Mathematics Games vs. Flashcards Improving the Mathematics Fact Fluency of First Grade Students.Lincoln, A., Tran, L., & Powell, S., (2019). What the hands tell us about mathematical learning: A synthesis of gesture use in mathematics instruction. Gesture, 17(3), 374–415. https://doi.org/10.1075/gest.17014.mar.
- Mangwende, E., & Maharaj, A., (2020). Barriers to Mathematics Teachers' Use of Their Knowledge of Students' Learning Styles in Mathematics Teaching: A Case of Secondary Schools in Zimbabwe. ISSN:1305-8223. https://doi.org/10.29333/ejmste/109198
- Masinsin, N., (2022). Remote Enrollment System in Public Elementary Schools in Pililla Sub Office. Journal of Innovative Science and Research Technology; ISSN No:-2456-2165.
- Norqvist, M., (2018). The Effect of Explanations on Mathematical Reasoning Tasks. International Journal of Mathematical Education in Science and Technology, v49 n1 p15-30.
- 19. Norqvist, M., Jonsson, B., Lithner, J., Qwillbard, T. & Holm, L. (2019). Investigating Algorithmic and creative reasoning strategies by eye tracking. matematikdidaktik.org http://matematikdidaktik.org.
- 20. Nzesei, M, M. (2015). A correlation study between learning styles and academic achievement among second school students in Kenya. A Thesis of University of Nairobi, Department of psychology.
- 21. Petropovlov , G., Jaworski, B., Potari, D., and Zachariades, T., (2020). Undergraduate Mathematics Teaching in First YearLectures: Can it be Responsive to Student LearningNeeds? Springer Nature Switzerland
 AG
 AG
 2020. https://www.academia.edu/79656753/Undergraduate Mathematics Teaching in First Year Lectures.
- 22. Prayoga, T., Abraham, J., (2017). A Psychological Model Explaining Why We Love Or Hate Statistics. Kasetsart Journal, Binus University.
- 23. Razak, N., Yassin, A., and Maasum, N., (2018). Cooperative Learning: General and Theoretical Background. UJMER8(2)141-146, Unnes Journal of Mathematics Education.
- 24. Sarode, R., (2018), Teaching strategies, styles and qualities of a Teacher: a review for valuable higher education, International Journal Of Current Engineering And Scientific Research (IJCESR), Sant Gadge Baba Amravati University, Amravati, ISSN (Print): 2393-8374.
- Viirman , O., (2021). University Mathematics Lecturing as Modelling Mathematical Discourse. International Journal of Research in Undergraduate Mathematics Education volume 7,pages466–489 (2021).