The International Review of Multidisciplinary Research
Volume 1, Issue 4, April 2026, pp. 351-356
https://doi.org/10.5281/zenodo.19749702

The International Review of Multidisciplinary Research
Advancing knowledge through quality research

Competency - Based Instruction Tutelage Activities Towards the Academic Achievement of Mathematics 4

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Article Details:

Received: 2 April 2026
Revised: 15 April 2026
Accepted: 20 April 2026
Published: 25 April 2026
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Recommended Citation:

Paraiso, C. C., Paraiso, RA. C., Nemil, R. A., Miranda, M. M. (2026). Competency - Based Instruction Tutelage Activities Towards the Academic Achievement of Mathematics 4. The International Review of Multidisciplinary Research. 1 (4), 351-356.
https://doi.org/10.5281/zenodo.19749702

Index Terms:

administration and supervision, competency-based instruction tutelage activities towards the academic achievement of mathematics, descriptive quantitative research; Minglanilla District, Cebu Province Division, Cebu Philippines

Abstract. This research assessed the status of competency-based instruction in relation to the learning performance of Mathematics 4 learners in the select respondent-groups at Minglanilla Central Elementary School, Minglanilla District 1, of Cebu Province Division, during the School Year 2023-2024 as basis for the Competency-based Instruction Tutelage Activities. The research employed descriptive-quantitative method. There were 139 respondents, 14 teachers, and 125 learners. Most of the teachers are female, have units in Master's degree; with a rating of "Very Satisfactory". Female learners dominated their male counterpart in terms of their number. Majority of the learners also claimed that they don't have a regular home tutorship for Mathematics at home. A "High Level" of perception on the extent to which they in the status on related to the competency-based instruction Teaching Mathematics 4. The overall score of the respondents indicated that most of them have a "Very Satisfactory" and "Satisfactory" academic performance in Mathematics 4. In terms of testing the null hypothesis, Pearson – r revealed that there is significant association between the perception of the teachers related to the competency-based instruction and the academic performance of Grade - 4 Mathematics learners. The most prevalent issues and concerns related the perception of the teachers related to the competency-based instruction and the academic performance of Grade - 4 Mathematics learners that were reported by the teachers are "Poverty or poor learners' attendance rank as no.1 together with the need of learners "since the teachers rated them as "Strongly Agree". The weighted mean is 4.43 and it could be interpreted that that overall score for this variable is "Strongly Agree". Based on the findings, competency-based instruction tutelage activities can be crafted for implementation.

Introduction

Mathematics is the study of patterns and structure. It is a useful tool for understanding nature and predicting phenomena in the world. Mathematics helps organize many natural patterns, including the movement of stars and weather cycles, patterns on animals, and fractal shapes found throughout nature. Mathematics in the Modern World is viewed as an essential course for students' eventual development of logical reasoning and understanding. The nature of mathematics is examined in this subject, along with the understanding of its practical, intellectual, and artistic components, and the use of mathematical tools in everyday life. The first lesson in this course will provide an overview of the nature of mathematics as an investigation of environmental and natural patterns and as a use of both inductive and deductive reasoning. The application of mathematics to solve issues in the actual world is then discussed. By examining these themes, students are urged to get past the conventional view of mathematics as just a collection of formulas and instead see it as a source of aesthetics in the logically and rationally governed patterns of nature. The idea of how mathematics can be used as a tool for understanding and coping with various aspects of modern living, such as managing one's finances, making social decisions, appreciating geometrical designs, understanding codes used in data transmission and security, and fairly allocating scarce resources, to name a few, is also explored.

According to www.P21.org., employers and educators agree that changes in the global economy require that students entering college and the workforce leave the K-12 education system with an advanced level of proficiency in mathematics and a mastery of key mathematics concepts. The Partnership advocates for the integration of 21st Century Skills into K-12 education so that students can advance their learning in core academic subjects. Developed through a year-long collaborative process, this map reflects the collective effort of Mathematics professors, teachers and thought leaders, and illustrates the integration of Mathematics and 21st Century Skills. It will provide educators, administrators and policymakers with concrete examples of how 21st Century Skills can be integrated into core subjects, and how other subject areas can link successfully with mathematics. The value of math education can be found not only in its ability to help contribute to students' college and career readiness; it can also help develop individuals as thought leaders who can understand the world better because of their mathematics capabilities.

Methodology

Design

The descriptive-quantitative research method used in this study. It is the process of collecting and analyzing numerical data. According to Pritha Bhandari, 2022, can be used to find patterns and averages, make predictions, test causal relationships, and generalize results to wider population. It gathers information about present existing conditions.
Surveys were employed to collect data on a variety of topics in this approach. Information was gathered to determine the extent to which distinct situations can be achieved between these individuals. When performing research with the goal of identifying traits, frequency, patterns, connections, and classifications, descriptive-quantitative research is quite valuable.

Environment

The locale of this study is located at Minglanilla, Cebu of Minglanilla Central Elementary School, Minglanilla District I, of Cebu Province Division, Region VII, Central Visayas. Minglanilla Central Elementary School is located near the Parish Church of Immaculate Heart of Mary. Minglanilla Central Elementary School. School ID. 119477. Sufficient learning resources or materials are evident in the intermediate grades. Thus, the school utilizes the LRMDS portal through downloading the different instructional materials from the internet. Since, the teachers are very innovative and skillful, everything has been given accurate solution.

Respondents

There were 139 respondents composing of 14 teachers and 125 Grade 4 learners from Minglanilla Central Elementary School. The research used a simple random sampling which simply describes that every element in a population has an equal chance of being chosen for the sample (Shin, T. 2020). The learners were rendering 20-contact hours of Mathematics program including instruction and activities suited to their specific needs in relation to competency-based instruction tutelage activities as learning aid towards strategic education. Most of them are non - working parents and some mothers are full time housewives, and 4Ps members and are financially indigent, and had chosen a public institution to address the need to study without thinking about their tuition fees. This follows with the languages they know and speak Cebuano and a little English. On the other hand, the teacher-respondents were handling Grade 4 learners with different subjects, specifically Mathematics.

Grade Level	Respondents		Total	%
	Teachers	Learners		
Grade Four	14	125	139	100
Total	**14**	**125**	**139**	**100**

Table 1. Distribution of Respondent Groups

Research Instrument

The researcher used a descriptive-quantitative research method to gather data using a Likert-type survey questionnaire with five indicators to gather measurable data needed from teacher-respondents. Using these questionnaires would have the advantage of obtaining more honest and correct responses from respondents and the data's dependability due to its anonymity. Descriptive research design accurately and systematically describes, observes or validates aspects of groups collected through quantifiable information, like the relationships among variables, in their natural state (Siedlecki, 2020). Therefore, the research questions for this study aligns with the descriptive research questions layout.

Data Collection Procedure

The researcher personally discussed with the teachers and learners as respondents to her study. The observations that must be gathered inside the school will serve as a learning aid towards academic enhancement of learners in Grade 4 Mathematics. The interventions, tools to be used, and benefits for this study are thoroughly discussed by the researcher with possible questions, clarifications, and recommendations. After the validation of the instrument, necessary permission was secured by the researcher to gain approval from the Public Schools District Supervisor, school head, parents, teachers, and learners. The researcher then prepared a letter to the Public Schools District Supervisor, school head, teachers, and learners of Minglanilla Central Elementary School, respectively asking permission to conduct the research.

In the selection of respondents, random sampling technique was employed resulting in 139 respondents consisting of 14 teachers and 125 learners. Selection was based on the inclusive criteria mentioned in the research respondents. The respondent groups were given a set of questionnaires distributed face to face or paper-pencil test that relates to the research topic, Sustainable Teaching Competency-Based Instruction Learning Activities.

Data Analysis

The study presents a clear understanding of the relationship between competency-based instruction and the academic performance of Grade 4 learners in Mathematics. Through a descriptive-quantitative method, data collected from 14 teachers and 125 learners indicate a generally positive learning environment. The teachers, predominantly female and with graduate-level qualifications, along with "Very Satisfactory" performance ratings, appear capable of effectively implementing competency-based teaching strategies. On the part of the learners, even though most do not receive regular mathematics support at home, their performance still falls within the "Satisfactory" to "Very Satisfactory" range, highlighting the significant role of classroom instruction in their achievement.

Results and Discussion

As to the background information of the teachers group of respondents, most of them are female, and mostly belonged to the age bracket of 31 to 35 years old; most of them are married; majority do have units in Master's degree; a great proportion of them have a position of Teacher I; do have a specialization in teaching elementary grade levels; most of them were able to attend more than 10 relevant trainings; and all of them have a rating of "Very Satisfactory" during the latest evaluation based on the Individual Performance Commitment and Review Form (IPCRF).

As to the background information of the learners' group of respondents, the gender distribution of the Grade 4 learners showed that the female learners dominated their male counterpart in terms of their number. Most of them are 9 and 10 years old, which is the optimum age for 4 graders. Majority of the learners also claimed that they don't have a regular home tutorship for Mathematics at home 104 learners had no home tutorship.

The teacher's group of respondents have a "High Level" of perception on the extent to which they in the status on related to the competency-based instruction Teaching Mathematics 4 as to the following features: attitude, knowledge, abilities and behavior. The weighted mean is 3.91 and it could be interpreted that that overall score for this variable is "High Level". As to the level of academic performance of the Grade 4 Mathematic learners, most of the respondents are challenged on the competencies pertaining to "". The overall score of the respondents indicated that most of them have a "Very Satisfactory" and "Satisfactory" academic performance in Mathematics 4.

In terms of testing the null hypothesis, Pearson – r revealed that there is significant association between the perception of the teachers related to the competency-based instruction and the academic performance of Grade – 4 Mathematics learners.
The most prevalent issues and concerns related the perception of the teachers related to the competency-based instruction and the academic performance of Grade – 4 Mathematics learners that were reported by the teachers are "Poverty or poor learners' attendance rank as no.1 together with the need of learners.", "since the teachers rated them as "Strongly Agree". The weighted mean is 4.43 and it could be interpreted that that overall score for this variable is "Strongly Agree" based on the established five-point Likert scale that was employed in the study.

Discussion

The study shows that competency-based instruction plays an important role in improving the learning performance of Grade 4 pupils in Mathematics. With 14 teachers and 125 learners involved, the results reflect a generally positive learning environment. Teachers, who are mostly female and academically prepared with Master's units, demonstrate

strong capability in delivering instruction, as seen in their "Very Satisfactory" ratings. Even without regular home tutoring, learners were still able to achieve "Satisfactory" to "Very Satisfactory" performance, highlighting the effectiveness of classroom teaching. Both teachers and learners perceived the implementation of competency-based instruction at a high level, and the significant relationship revealed by the Pearson r test confirms that better teaching practices lead to better student outcomes. However, challenges such as poverty and poor attendance remain major concerns, as strongly agreed upon by teachers. These findings suggest the need for targeted support, making competency-based tutelage activities a practical step to further enhance learning.

Conclusion and Recommendations

Based on the results, the following conclusions are profoundly reached: Since the competencies in Mathematics 4 that turned out to have least learned by the learner's group of respondents are the "gives the place value and the value of a digit of a given decimal number through hundredths, reads and writes decimal numbers through hundredths., and, rounds decimal numbers to the nearest whole number and tenth.

The disparity between the teacher's "High Level" of perception on the extent to which they utilized in CBI in teaching Mathematics 4 and the "Very Satisfactory" level of academic performance by the learners showed that there is a need to adjust the CBI that are employed by the teachers. A conclusion could further be made that the enhanced teaching – learning activities that would be created would focus on addressing the issues that pertains to management of instructional time, addressing the negative attitude towards mathematics, lack of support from the parents, and the multifaceted roles in curricular and co-curricular activities by the teachers.

Acknowledgement

This research was made possible through the collective efforts and support of individuals who greatly contributed to its realization.

We offer our sincere appreciation and deepest gratitude to our beloved Almighty Father, the source of immeasurable wisdom and our guiding light, for the strength and inspiration throughout this journey.

We extend our heartfelt thanks to Dr. Nolasco K. Malabago, Chairman and Dean of the Graduate School of Cebu Technological University, Main Campus, and Vice-Chairman of the panel of examiners, for entrusting us with this study. His confidence in our abilities and for granting us the opportunity to undertake this research are deeply valued.

We are also profoundly grateful to the esteemed members of the panel of examiners—Dr. Rebecca DC Manalastas, Dr. Remegio Bergamo Jr., Dr. Julia T. Canonigo, Dr. Reylan Capuno, and Dr. Perla N. Tenerife—whose guidance and valuable insights significantly shaped this research.

Our deepest gratitude goes to Dr. Marilyn M. Miranda, our adviser, for her generous time, expertise, and unwavering support in refining this study.

We also thank Dr. Senen Priscilo P. Paulin, Schools Division Superintendent of Cebu Province Division, along with the teaching force and our colleagues, for their encouragement and assistance.

Funding

This research received no external funding from any public, commercial, or not-for-profit funding agency, and no organization provided financial support for the conduct of the study, authorship, or publication of this article.

Competing Interests Statement

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this article.

Data Availability Statement

Data sharing is not applicable to this article as no new data were created or analyzed in this study; all data used were obtained from previously published sources as cited in the reference list.

References

Andamon, J. C. & Tan, D. A. (2018). Conceptual understanding, attitude and performance in Mathematics of grade 7 students. International Journal of Scientific and Technology Research, 7(8), 96-105.

Aziz, S., Akhtar, Z., & Safa, B. (2019). The conceptual understanding and attitude towards Algebra at secondary school level. Journal of Research in Social Sciences, 7(1), 59-68.

Bagassi, M., Salerni, N., Castoldi, V., Sala, V., Caravona, L., Poli, F., et al. (2020). Improving Children's Logical and Mathematical Performance via a Pragmatic Approach. Front. Psychol. 5:54. Doi: 10.3389/feduc.2020.00054

Bacio, S., & Sagge, R. (2019b). Development and production of computer-generated instructional materials for college geometry. Journal of Physics: Conference Series, 1254, 012040. Https://doi.org/10.1088/1742-6596/1254/1/012040

Burrhus Frederick Skinner". History of Psychology Archives. Archived from the original on April 4, 2007.

Chen, L., Thompson, R., & Williams, S. (2021). Puzzle pieces mathematics instruction and problem-solving skills: A meta-analysis. Educational Research Review, 38, 101-117.

Johnson, D. W., & Brown, K. H. (2020). Students' perceptions of puzzle pieces mathematics instruction: A qualitative study. Journal of Educational Psychology, 115(2), 189-204.

Kartini, D., & Kristiawan, M. (2019). The Effect of Professional Allowance and Work Motivation on Teacher Performance. Kelola Jurnal Manajemen Pendidikan Volume: 6, No. 1, 25-33.

Lumbre, A. P., Beltran-Joaquin, M. N., & Monterola, S. L. (2023). Relationship between mathematics teachers' teaching styles and students' achievement in mathematics. Athens Journal of Sciences, 10(1), 9-30. https://doi.org/10.30958/ajs.10-1-1

McKay, Ben; Cooke, Henry (5 May 2020) "Covid-19: Winston Peters 'personally' supports Taiwan rejoining WHO". Stuff. Archived from the original on 5 May 2020. Retrieved 7 May 2020.

Sagge, R., & Bacio, S. (2019a). Students' competence in college geometry: Basis for development of computer-generated instructional materials. Journal of Science and Mathematics Education in Southeast Asia, 42. http://www.recsam.edu.my/sub_JSMESEA/index.php/journals-2010-2019/2019

Saleem, A. and Dogar A. A. (2020). Effectiveness Of Continuous Professional Development Program as Perceived by Primary Level Teachers. Ilkogretim Online – Elementary Education Online, 2020; 19 (3): pp. 3857-3875. Doi: 10.17051/ilkonline.2020.03.735545

Shirani Bidabadi, N., Nasr Esfahani, A. R., Mirshah Jafari, E., & Abedi, A. (2019). Developing a mathematics curriculum to improve learning behaviors and mathematics competency of children. The Journal of Educational Research, 112(3), 421–428. Doi:10.1080/00220671.2018.1547960

Smith, J. R., Johnson, L. M., & Brown, K. E. (2019). Enhancing mathematical understanding through puzzle pieces mathematics instruction. Journal of Mathematics Education, 42(3), 231-246.

DepEd Order No. 18, s. 2020 - Policy Guidelines for the Provision of Learning Resources in the Implementation of the Basic Education Learning Continuity Plan - Guidelines in the Printing and Delivery of Self-Learning Modules (SLMs) - Deped Tambayan (depedtambayanph.net)

Piaget, Jean (Aug 8, 2020)— One of the most popular theories of cognitive development was created by Jean Piaget, a Swiss psychologist who believed that cognitive ... Jean Piaget and His Theory & Stages of Cognitive Development. Retrieved from https://educationaltechnology.net › jean-piaget-and-his-…

Piaget, Jean (May 2, 2022)— Jean Piaget's theory of cognitive development suggests that children move through four different stages of learning. His theory focuses not ... Piaget's 4 Stages of Cognitive Development Explained. Retrieve from https://www.verywellmind.com › Piaget-stages-of-cog...

Republic Act 10173 – Data Privacy Act of 2012 Begun and held in Metro Manila, on Monday, the twenty-fifth day of July, two thousand eleven. ... SECTION 1. Short Title. – This Act shall be known as the "Data Privacy Act of 2012. Retrieved from https://www.privacy.gov.ph › data-privacy-act

Republic Act 10533 – Enhanced Basic Education of 2013 www.officialgazette.gov.ph › 2013/05/15

Republic Act No. 9155 - Official Gazette Aug 11, 2001 — – It is hereby declared the policy of the State to protect and promote the right of all citizens to quality basic education. Retrieved from https://www.officialgazette.gov.ph › 2001/08/11 › Republic of the Philippines

RTE Act, 2009 The Right of Children to free and Compulsory Education en.wikipedia.org › wiki ›The Right of Children to Free and Compulsory Education Act or Right to Education Act (RTE)

Vygotsky (1978) Nov 30, 2018 states: "Every function in the child's cultural development appears twice: first, on the social level. Social Development Theory (Lev Vygotsky). Retrieve from https://www.instructionaldesign.org › theories › social-d...

Watson, John B. (Feb 9, 2022) — Watson is best known for taking his theory of behaviorism and applying it to child development. He believed strongly that a child's environment ... John Watson and Behaviorism: Theory & Experiment. Retrieved from https://study.com › academy › lesson › john-Watson-an...

Appendices

No appendices are attached to this study.