

Systematic forecasting and meta-analysis of learners' numeracy and literacy status in selected divisions of Region IV-A CALABARZON, Philippines

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Abstract

To commensurate with the two-year educational lag brought about by COVID-19, DepEd Order 34 of 2022 (5 days in-person classes) and DepEd Order 14 of 2023 (implementation of National Learning Camp) were signed. This study aimed in constructing a projection of the status of numeracy and literacy skills of learners in selected divisions of DepEd Region IV-A CALABARZON Philippines for the next years to come. The data came from six divisions who positively responded to the study proposal. Data gathered was through Google Form distributed to school heads accompanied by informed consent and Division indorsements. Having the data for five consecutive previous years constituted the elements for systematic forecasting. It was found out that school size, curricular classification and OPCR rating significantly affect Mathematics MPS (p-values 0.001, 0.005 and 0.011). On the other hand, only school size and curricular classification significantly affect English MPS (p-values 0.049 and 0.043). Meanwhile, student related factor and English MPS are significantly correlated with each other (p-value 0.016). As the historical pattern behaves in linear fashion, it was predicted using linear regression that in the year 2028, Mathematics MPS for Key Stage 1 is 82.102, KS2 is 81.952, KS3 is 77.927, and KS4 is 72.287. While for English, it was predicted that in the year 2028, KS1 will have MPS of 81.357, KS2 is 81.481, KS3 is 71.347, and KS4 is 81.467. Recommended projects are laid down at the end of the study to alleviate the effect of pandemic to learners' numeracy and literacy skills.

Keywords: numeracy; literacy; Mathematics; English; learners

1. Introduction and Rationale

To commensurate with the two-year educational lag brought about by COVID-19 pandemic, when Vice President Sarah Duterte of the Republic of the Philippines was instated as the Secretary of the Department of Education, DepEd Order No. 34 series of 2022 was signed. This particular order entitled "School Calendar and Activities for the School Year 2022-2023" is part of the recovery plan of leveraging back into the norm disrupted by the two-year pandemic. It recognized the need to resume the 5 days in-person classes, providing the schools their own strategy of slowly transitioning from distance learning modality to face-to-face interaction (Part V. 16-17. General Guidelines). For those schools who operated on limited face-to-face classes in the last quarter of the school year 2021-2022, they were encouraged to carry on with the 5-day face-to-face classes. From the opening of class which was August 22, 2022 until October 31, 2022, schools can choose from any of the following schemes: (a) 5-days of in-person classes, (b) blended learning, or (c) full distance learning. But starting November 2, 2022, both public and private schools are expected to

have transitioned to 5 days in-person classes. There should be no more blended learning and full distance learning, except for those implementing the Alternative Learning System and those under Homeschooling Program.

After a school year of trying to leverage back into the norm, the Department of Education continued to pursue schemes that would cater into the enhancement of learners, especially those who are lagging behind. DepEd Order No. 14, series of 2023 was introduced, as replacement of the summer class for those who need academic assistance in getting ready for the next grade level. The order is entitled “Policy Guidelines on the Implementation of National Learning Camp”, and this is in line with the department’s agenda “MATATAG: Bansang Makabata, Batang Makabansa.” The NLC (National Learning Camp) is a voluntary learning recovery program and it operates as an intervention camp. It has the following five guiding principles: (a) Every learner has the right to learn, (b) Engaged learners are motivated, inspired, and willing to invest effort in learning, (c) Teaching must be rigorous and relevant, (d) Purposeful assessment enhances teaching and learning, and (e) A whole-school approach and community engagement support the improvement of education quality (Part IV.11 Policy Statement). This is offered initially for Grades 7 and 8 in English, Science and Mathematics in three groups based on learning needs – Consolidation Camp (for learners needing practice and application), Enhancement Camp (for advanced learners) and Intervention Camp (for high-need learners). Enhancement Camp is for three weeks, while Consolidation and Intervention Camps are for five weeks. All these three camps have a three-day engagement with learners every week. This commenced one week after the end of the school year rites.

With these two recently implemented programs (return of 5 day in-person classes and learning camps), and many other projects being implemented, will the Filipino learners be able to leverage back into the norm back when the pandemic has not yet hit the globe? In how many years can the Department of Education in the Philippines foresee the coming back of the norm in teaching and learning, and the former non-pandemic status in numeracy and literacy? And what are the factors affecting the numeracy and literacy progress of learners? These are the aspects that his basic research would like to investigate. The findings in this study can be used in action plans needed to have education recovery, specifically in terms of the two areas mentioned above.

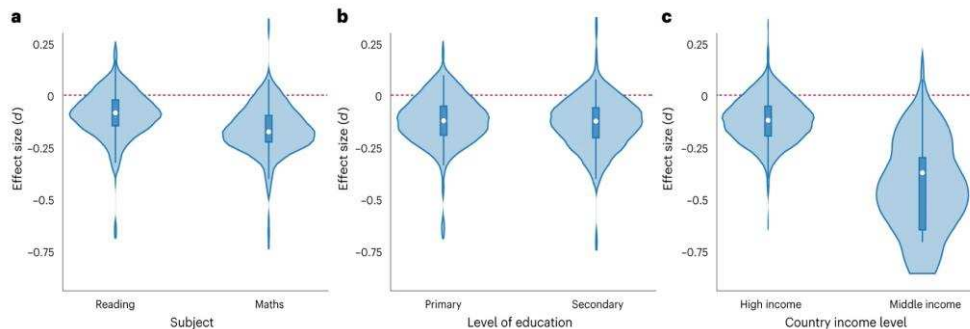
2. Literature Review

The study made by Betthäuser, Bach-Mortensen and Engzell (2023) revealed learning deficits from 291 countries are noticeably observed both in Mathematics and in Reading. But between these two areas, it is in Mathematics that learners are having more learning deficits compared in Reading. The learning deficit is also observed in terms of level of education and country income level. In terms of subject, reading is set at -0.09 while math is set at -0.18 during the pandemic period, the 0.00 being the standard performance of learners during pre-pandemic (2019). During times of pandemic, it can be said that parents are able to extend help to learners in terms of reading than in Mathematics. In terms of level of education, though both primary and secondary are set at -0.12, the interquartile range of the learning deficit in primary is -0.19 to -0.05 while for secondary is -0.21 to -0.06. The range of deficit in secondary is seen to be wider in a sense that as when the learners progress from one stage to another, the competency that they are lagging behind in previous stage is carried to the next stage. While for country income level, the high-income group has a learning deficit set at -0.12 and for middle income group is at -0.37. It is interesting to note that high-income group were able to sustain learning through materials that they can provide to their kids, and even probably paid learning assistance.

The in-dept study made Byant, Dorn and Sarakatsannis (2023) highlighted the report of the National Assessment of Educational Progress (NAEP) or the Nation’s Report Card of the United States of America. The two decades of effort and progress of education in terms of Math and Reading for Grades 4 and 8 were wiped out by the pandemic. When the pandemic hit the world, the national score dropped by 5 points and 8

Fig. 6: Variation in estimates of COVID-19 learning deficits ($n = 291$) across different characteristics.

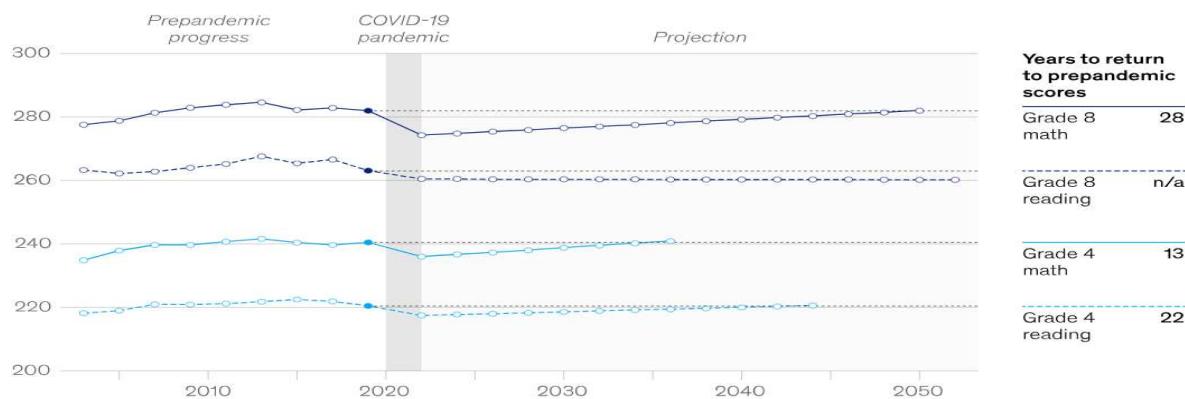
From: [A systematic review and meta-analysis of the evidence on learning during the COVID-19 pandemic](#)



points in Math 4 and Math 8 respectively, while a drop of 3 points both in Reading 4 and Reading 8. Getting back in the status during pre-pandemic will take 28 years for Grade 8 Math, 13 years for Grade 4 Math, 22 years for Grade 4 reading, and no prediction of getting back into leverage for Grade 8 Reading because there is no progress that was noted after the pandemic.

If future National Assessment of Educational Progress score patterns reflect historical trends, it will take many decades to return to 2019 levels.

National Assessment of Educational Progress composite scores, by grade and subject



Note: Projections assume the 2003–19 CAGR of 0.10% for grade 8 math; 0.0% for grade 8 reading; 0.15% for grade 4 math; 0.06% for grade 4 reading.
 Source: The Nation's Report Card

This numeracy and literacy issues are not only seen during the early adolescent and adolescent period, but was detected to be at starting early in toddlerhood. A study made by Salminen, et. al. (2021) of 265 participating Finnish children was tested twice between their ages 2.5 and 6.5 in eight domains, namely, counting objects, number production, number sequence knowledge, number symbol knowledge, number naming, vocabulary, print knowledge, and letter knowledge. For their parents, the aspects investigated were parental reading difficulty (RD), mathematical difficulty (MD), parental education (PE), and home learning environment (HLE). The study revealed that there is a complex pattern of associations between the four sub-variables (RD, MD, PE and HLE), and the eight domains tested among the children-participants. Children's numeracy and literacy skills starts to form pattern in toddlerhood, and the parental and home issues are seen to be associated with these skills.

Three general factors that might be affecting numeracy skills were investigated by Latiban and Mendez (2022). Their study resulted into a moderate relationship between the level of numeracy skills and factors affecting numeracy skills – (1) student-related factors, (2) environmental factors and (3) teacher factors. Among these three factors, the teacher factor in terms of encouraging cooperation and participation was the problem that affected student's level of numeracy skills. The result implied that some actions must be taken, especially for classroom teachers.

Groves Learning Organization (2021) lined up five literacy skill areas that can impact a person's ability to read well:

1. Phonemic awareness: the ability to identify and manipulate individual sounds in spoken words.
2. Alphabetic principle: understanding there are systematic and predictable relationships between written letters and spoken sounds.
3. Applying reading skills in a rapid and fluent manner.
4. A strong vocabulary coupled with syntactic and grammatical skills.
5. Good comprehension and the ability to related reading to our own experiences.

The above-mentioned studies shed light into the areas of concern of this present study, which is forecasting of the numeracy and literacy status of learners, and factors affecting the progress in those two areas.

2.1. Research Questions

This study aims to make a projection of the status of numeracy and literacy skills of the learners in the selected divisions of DepEd Region IV-A CALABARZON, Philippines in the next years to come.

Specifically, it sought to answer the following questions:

1. What is the profile of the schools in DepEd Region IV-A CALABARZON in terms of the following:
 - a. School type
 - b. School size
 - c. Curricular classification
 - d. 2022 OPCRf Rating
2. During school year 2022-2023, what is the mean level of status of the factors surrounding numeracy skill in terms of the following:
 - a. Student-related factor;
 - b. Environmental factor; and
 - c. Teacher factor?
3. During school year 2022-2023, what is the mean level of status of the factors surrounding literacy skill in terms of the following:
 - a. Student-related factor;
 - b. Environmental factor; and
 - c. Teacher factor?
4. What is the mean percentage score in Mathematics of the K-12 learners in DepEd Region IV-A CALABARZON for the last five school years (s.y. 2018-2019, s.y. 2019-2020, s.y. 2020-2021, s.y. 2021-2022, s.y. 2022-2023)?
5. What is the mean percentage score in English of the K-12 learners in DepEd Region IV-A CALABARZON for the last five school years (s.y. 2018-2019, s.y. 2019-2020, s.y. 2020-2021, s.y. 2021-2022, s.y. 2022-2023)?
6. Do school type, size, curricular classification, and OPCRf rating, significantly affect numeracy and literacy skills?
7. Do student-related factors, environmental factors and teacher factors significantly relate to numeracy and literacy skills?

8. If the score patterns reflect the historical trends, what would be the status of the numeracy and literacy skills of learners in DepEd Region IV-A CALABARZON for the next 5 years?

2.2. Scope and Limitation

This study analyzed the data that came from the 6 divisions of DepEd Region IV-A CALABARZON, namely, Laguna Province, San Pedro City, Cabuyao City, San Pablo City, Tanauan City and Tayabas City. Data gathering was through Google Form sent through the higher offices of the said divisions, preferably the CID or SGOD. Data gathered encompasses the five consecutive school years (2018-2019, 2019-2020, 2020-2021, 2021-2022 and 2022-2023). Having the data for five years constituted the elements for a systematic forecasting of the status for the next years, if data follows the historical pattern. The result may not be conclusive for the whole DepEd Region IV-A CALABARZON because there were only 6 out of 23 divisions included in the study. Therefore, it is suggested for future researchers to expand the scope of this study so as to cover more divisions and make a projection or forecast of the numeracy and literacy status for the whole region.

3. Research Methodology

3.1. Sampling

The Department of Education, Region IV-A CALABARZON is currently spearheaded by the able leadership of the Regional Director Alberto T. Escobarte and Assistant Regional Director Loida N. Nidea (OIC-ARD). The 23 divisions comprising DepEd Region IV-A CALABARZON includes Batangas, Cavite, Laguna, Quezon, Rizal, Antipolo City, Bacoor City, Batangas City, Biñan City, Cabuyao City, Calamba City, Cavite City, Dasmariñas City, Imus City, Lipa City, Lucena City, San Pablo City, Sta. Rosa City, Tanauan City, Tayabas City, General Trias City, San Pedro City, and Sto. Tomas City. From this 23 Divisions, 14 were chosen to be part of this study that will provide baseline data for the purpose of forecasting the numeracy and literacy status in the coming years, and thereby causing the recommendation of general action plans. The table below shows some information about the 6 divisions which responded positively for this exploration.

Division	Superintendent	Assistant Superintendent/s	Headquarters/ Tel. Nos.
Laguna	Editha M. Atendido	Elvira B. Catangan (OIC-ASDS) Arlene R. Carpio	Prov. Capitol Compound, Brgy. Poblacion, Sta. Cruz, Laguna (049) 566-5013; laguna@deped.gov.ph
Cabuyao City	Christopher R. Diaz	Gregorio A. Co, Jr.	Brgy. Banay Banay, City of Cabuyao, Laguna (049) 470-1994 division.cabuyao@deped.gov.ph
San Pedro City	Rogelio F. Oplencia (OIC)	Ronald V. Ramilo (OIC-ASDS)	Luna St., Brgy. Poblacion, San Pedro City, Laguna (02) 8555-8871

San Pablo City	Gerlie M. Ilagan (OIC)	Buddy Chester M. Repia (OIC-ASDS)	Rizal Avenue, San Pablo City, Laguna (049) 521-0645; 503-5963, sanpablo.city@deped.gov.ph
Tanauan City	Lourdes T. Bermudez	Rhina O. Ilagan (OIC-ASDS)	Pob 1 Tanauan City (043) 405-0927; 723-9015 tanauan.city@deped.gov.ph
Tayabas City	Celedonio B. Balderas, Jr.	Antonio O. Faustino, Jr. (OIC-ASDS)	Brgy. Poto, Tayabas City (042) 710-0329 tayabas.city@deped.gov.ph

Source: Department of Education, Regional and Division Offices Directory (<https://www.deped.gov.ph/contact-us/regional-division-offices-directory/>)

3.2. Data Collection

Google Form was distributed to school heads upon the indorsement of the division superintendents. Data Privacy declaration was included in the beginning of the Google Form. This indorsed Google Form has four parts: (1) Profile of school, (2) Factors contributing to numeracy skill progression, (3) Factors contributing to literacy skill progression, and (4) MPS of learners in Mathematics and English for five consecutive school years (2018-2019, 2019-2020, 2020-2021, 2021-2022 and 2022-2023).

For the school profile, the following are the data collected:

- School type
- School size
- Curricular classification
- 2022 OPCR Rating

For the factors contributing to numeracy and literacy skill progressions, there were three sub-areas with five indicators for each. The three sub-areas are the following:

- Student-related factor
- Environmental factor
- Teacher factor

For a comprehensive view of each of these sub-areas, several indicators were rated by the school heads in terms of their perception on satisfactory level, with the following Likert-Scale equivalents:

- 5 – Very Highly Satisfactory
- 4 – Highly Satisfactory
- 3 – Satisfactory
- 2 – Fairly Satisfactory
- 1 – Unsatisfactory

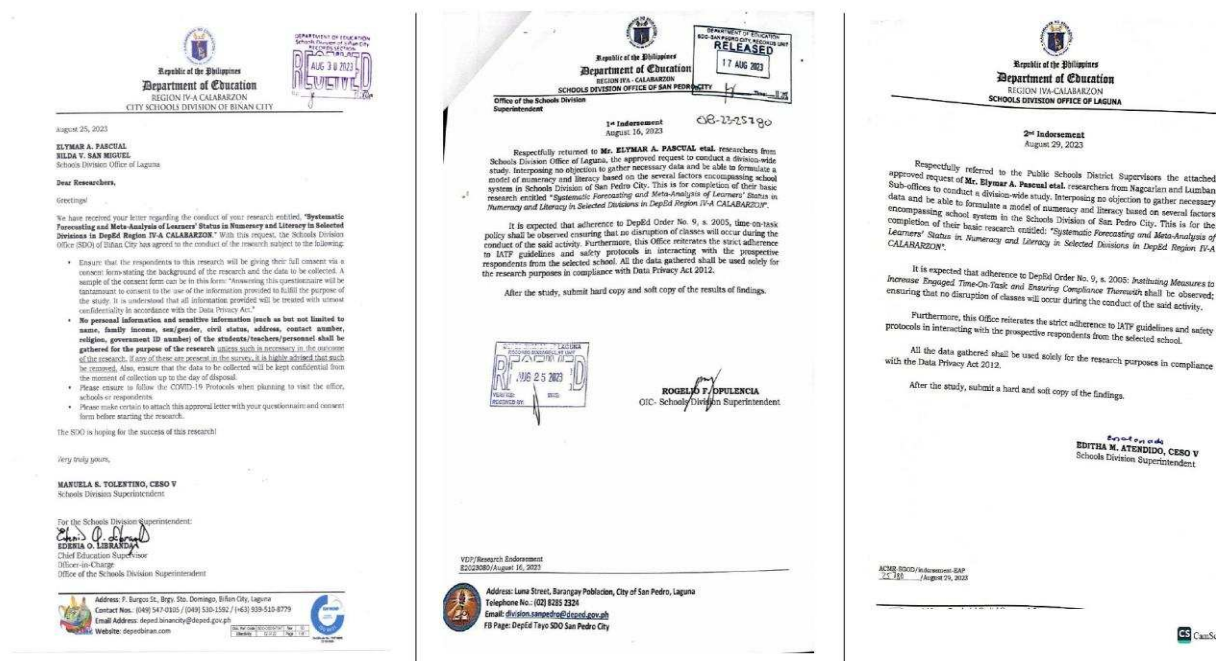
Before the administration of this survey questionnaire through Google Form, face/expert validation were conducted to ensure that the data to be collected would indeed correspond to the objective of this study, and would elicit necessary data for systematic forecasting and meta-analysis procedures.

3.3. Ethical Issues


The following necessary steps were conducted to ensure that no parties or respondents would have their rights violated and the participation would be voluntary.

1. **Letter and basic research proposal given to Division Superintendents** – The authors tried to personally visit the division offices and deliver the letter and research proposal to the division head, asking for permission to conduct the study by explaining the objectives and benefits that would come out of the findings in the study. If schedule would not permit, a letter and research proposal was sent online.
2. **Securing Indorsements from High Officials** – With the permission coming from the division heads, indorsement letter was secured so that the distribution of Google forms would be duly authorized.

Indorsements from Biñan City, San Pedro City and Laguna Province



Indorsements from Cabuyao City, Calamba City, Quezon Province, San Pablo City, Tanayan City and Tayabas City


Republic of the Philippines
Department of Education
 REGION IV-A CALABARZON
 CITY SCHOOLS DIVISION OF CABUYAO

DIVISION LETTER

To : **ALL PUBLIC ELEMENTARY AND SECONDARY SCHOOL HEADS**

From : **SCHOOLS DIVISION SUPERINTENDENT**


Date : **August 17, 2023**

Attached herewith is a letter from **ELYMAR A. PASCUAL, et al.**, researchers from Schools Division Office of Laguna, seeking permission to administer survey questionnaires from the Elementary and Secondary School Heads in the City Schools Division for their study titled **"Systematic Forecasting and Meta-Analysis of Learners' Status in Numeracy and Literacy in Selected Divisions in DepEd Region IV-A CALABARZON"**.

Permission is hereby granted provided that it adheres to the following conditions:


1. Strict observance of DepEd Time-On-Task Policy;
2. Must be in accordance with Republic Act No. 10173 - Data Privacy Act of 2012;
3. Participation of respondents must be purely voluntary;
4. Data collected shall be used only for the purpose of study;
5. Results of the study must be treated with utmost confidentiality, and this Office shall be provided a copy result.

For your information.


CHRISTOPHER R. DIAZ, CESO VI
 Schools Division Superintendent

2023-0805-01, 3040-PHS-JAA

Address: Calabiao Elementary Park, Calabiao Abatan Basic School (CABS)
 Brgy. Santa Rosa, City of Calabiao, Laguna
 Contact No. +63 917 472 1894
 Email Address: divisionoffice@deped.gov.ph
 Website: depedcalabiao.gov.ph


Republic of the Philippines
Department of Education
 REGION IV-A CALABARZON
 CITY SCHOOLS DIVISION OF CALAMBA CITY

7531
RELEASED
 Date: **Aug 15, 2023**

1st Indorsement
 August 11, 2023

Respectfully returned to **Mr. ELYMAR A. PASCUAL and Ms. NILDA V. SAN MIGUEL**, interposing no objection to administer survey questionnaire to selected learners in the Schools Division of Calamba City. This is for the completion of their research entitled **"Systematic Forecasting and Meta-Analysis of Learners' Status in Numeracy and Literacy in Selected Divisions in DepEd Region IV-A CALABARZON"**.


It is expected that adherence to DepEd's time-on-task policy shall be observed and informed consent must be secured to all the participants before the conduct of the said activity. It is also recommended that the data collection be administered online in line with the safety health protocols under COVID-19 pandemic. All the data gathered shall be used solely for the research purposes in compliance with Data Privacy Act 2012.


Requesting also that this office be furnished a copy of the results of the study.


MERVIN M. EVARONE, CESO V
 Schools Division Superintendent

DepEd (Research) Reference No. 2023-177/August 11, 2023

Address: City Hall Compound, Pags. Real, Calamba City, Laguna
 Telephone No. (042) 554-550 x 545
 Email Address: calambacity@deped.gov.ph
 Website: depedcalamba.gov.ph



Republic of the Philippines
Department of Education
 Region IV-A
 SCHOOLS DIVISION OF QUEZON PROVINCE


CLASSIFICATION
EXEMPTED FROM AUTOMATIC DECLASSIFICATION
 Date: **Aug 14, 2023**
 By: **1-38**

1st INDORSEMENT
 August 15, 2023

Respectfully returned to **Elymar A. Pascual**, researcher, **Talangan Integrated National High School**, Nagpartian, Laguna, approving the letter attached request to conduct a study entitled **"Systematic Forecasting and Meta-Analysis of Learners' Status in Numeracy and Literacy in Selected Divisions in DepEd Region IV-A CALABARZON"**.

Proper coordination with the school heads, teachers and students within the Division of Quezon is advised in as to ensure that the provisions of DepEd Order No. 6, s. 2020 (Ensuring Measures to Increase Engaged Time-On-Task and Ensuring Compliance Therewith) shall be observed.


ROMMEL CALAUTISTA, CESO V
 Schools Division Superintendent

DepEd (Research) Reference No. 2023-04-12-033

Address: 3501 Pags. Real, Nagpartian, Quezon
 Telephone No. (042) 784-0366, (042) 784-0368, (042) 784-0369, (042) 784-0371
 Email Address: divisionoffice@deped.gov.ph
 Website: www.depedquezon.gov.ph


Republic of the Philippines
Department of Education
 REGION IV-A CALABARZON
 SCHOOLS DIVISION OF SAN PABLO CITY

Office of the Schools Division Superintendent

1st Indorsement
 22 August 2023


Respectfully returned to **ELYMAR A. PASCUAL**, Master Teacher 3, Talangan Integrated National High School, Nagpartian, Laguna and **NILDA V. SAN MIGUEL**, Principal II, Lumbao Central Elementary School, Lumbao, Laguna, interposing **NO OBJECTION** to the hereto request to conduct research entitled: **"SYSTEMATIC FORECASTING AND META-ANALYSIS OF LEARNERS' NUMERACY AND LITERACY STATUS IN SELECTED DIVISIONS OF DEPED REGION IV-A CALABARZON"** to Public Elementary and Secondary School Heads, this division, provided that you will coordinate with the principal and Time-On-Task Policy and the No Disruption of Classes Policy of the Department shall be observed.

It is understood that the safety protocols set by IATF will strictly follow.


GERARDO M. MAGANA, CESO VI
 Assistant Schools Division Superintendent
 SAC - Schools Division Superintendent

(042) 46-8896
 2023-08-22

Real Address: San Pablo City, Laguna 4000
sanpablocity@deped.gov.ph
sanpablocity.com
 (049) 561-1967


Republic of the Philippines
Department of Education
 REGION IV-A CALABARZON
 CITY SCHOOLS DIVISION OF TANAYAN

CR 2023 - 1948

11 August 2023

ELYMAR A. PASCUAL
 Researcher
 TNSOS
 SDO Laguna

Dear Researcher:


Greetings of health and safety!

This is in connection with your letter dated August 9, 2023, regarding your request to conduct your study among Schools of RDO Tanayan City.


Relative to this, permission is granted to you provided that **DepEd Order No. 9, s. 2020, Instituting Measures on Time - On - Task and Data Privacy Act of 2012** will be strictly observed. Please coordinate directly with our School Heads regarding your activity.

Lastly, to fulfill our vision of continuous improvement for better service delivery, we request that you provide this office with an e - copy of your findings and recommendations.

Sincerely,


LEOPOLDO T. SAN MIGUEL, CESO VI
 Schools Division Superintendent

Address: Pags. Real, Tanayan City, Laguna 4000
 Telephone No. (042) 724-0371, (042) 724-0372, (042) 724-0373
 Email Address: tanayan@deped.gov.ph
 Website: www.depedtanayan.gov.ph


Republic of the Philippines
Department of Education
 REGION IV-A CALABARZON
 CITY SCHOOLS DIVISION OF THE CITY OF TAYABAS

August 15, 2023

ELYMAR A. PASCUAL
NILDA V. SAN MIGUEL
 Talangan Integrated National High School/ Lumbao Central Elementary School
 Schools Division of Laguna
 Laguna Province

Dear Researchers:

Greetings of peace!


This is in line of your request to conduct study among school heads in the Schools Division of Tayabas City for the study titled **"Forecasting and Meta-analysis of Learners' Status in Numeracy and Literacy in Selected Divisions in DepEd Region IV-A CALABARZON"**. This is to inform you that your request is hereby granted. Likewise, you are reminded of the following:

- a. strict adherence to data privacy act stipulated in DepEd Order No. 16, s. 2017, **THE RESEARCH MANAGEMENT GUIDELINES (RMG)**;
- b. that participation is strictly on a voluntary basis;
- c. that the study is free of charge and the participants should not spend any single centavo for this purpose;
- d. strict observance of **Time-On-Task Policy** or the **No Disruption of Classes Policy** of the Department; and
- e. submission to this office a copy of the research results.

It is our hope that you are one with the Division in the full utilization of research in improving learning delivery and learning outcomes.

Thank you and God bless!

Truly yours,


CELESTINO M. BALDERAS JR.
 Schools Division Superintendent

Brgy. Pags. Real, Tayabas City
 (042) 730-0329 or 731-0715
divisionoffice@deped.gov.ph
<http://www.depedtayabas.com/>

3. **Stipulation of Data Privacy Act** – School heads who would be receiving the electronic survey questionnaire was able to view the Data Privacy Notice, providing internal contract that the data to be collected would not be divulged into public use, but would be just for academic purposes.

4. **Dissemination of Findings to Authorities** – All the DepEd Divisions included in this study had the first-hand information about the result of the study before being disseminated in the public, so as to attest that all the information written in the accomplished document were treated fair and with utmost care and consideration.

3.4. Plan for Data Analysis

The following statistical tools were employed to generate quantitative answers to the research questions posted at the beginning of the study:

Research question no. 1 – frequency and percentage

Research question nos. 2 and 3 – mean and standard deviation

Research question nos. 4 and 5 – mean

Research question no. 6 – ANOVA

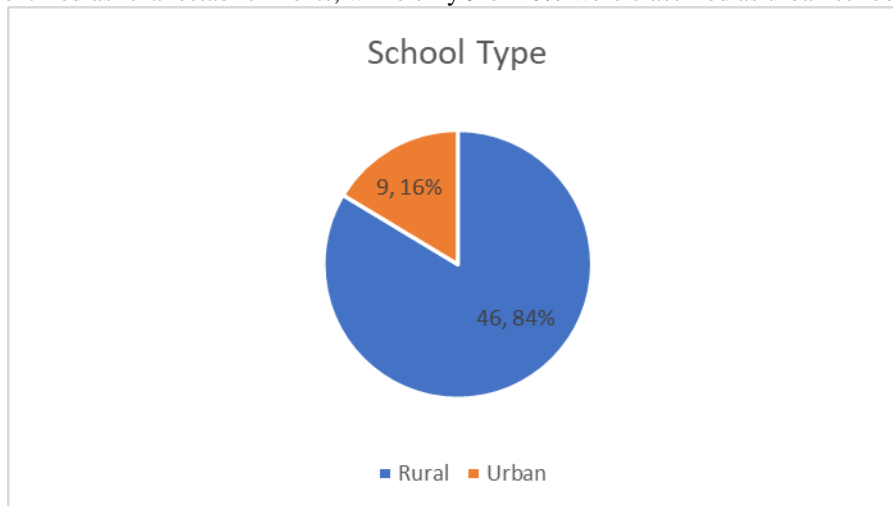
Research question no. 7 – Pearson-R

Research question no. 8 - linear regression for forecasting; the dependent variable was the year/school year, while the independent variable was the numeracy/literacy skills evident through mean percentage score; numeracy/literacy skills were predicted from the present time to the upcoming 5 years.

4. Discussion of Findings, Conclusion, Recommendations and Reflection

4.1. School Type

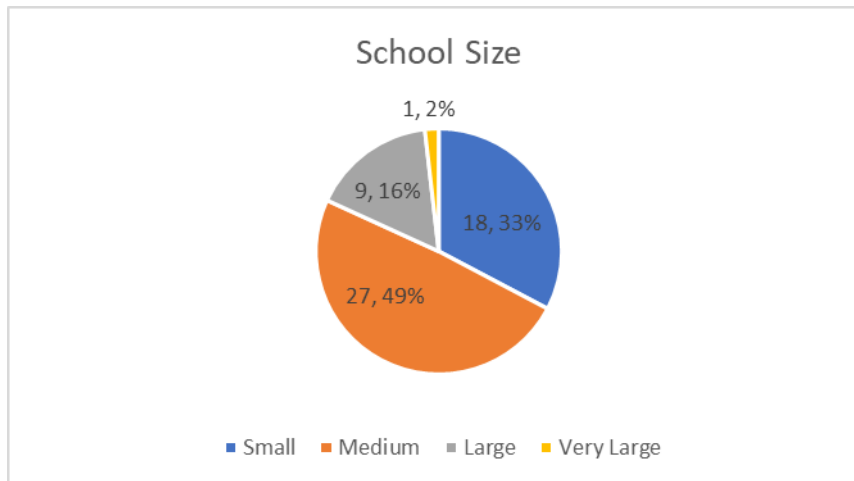
The data revealed that out of the total number of schools considered for this study, specifically 46 or 84% were identified as rural establishments, while only 9 or 16% were classified as urban schools.



This distribution indicates a clear dominance of rural schools among those included in the analysis. Consequently, based on the findings, it can be inferred that the dataset would encapsulate more on, but not limited to, the situations being experienced by rural educational institutions within the sample population under investigation. In other words, a significant majority of schools examined in this study are located in rural areas rather than urban or suburban regions.

4.2. School Size

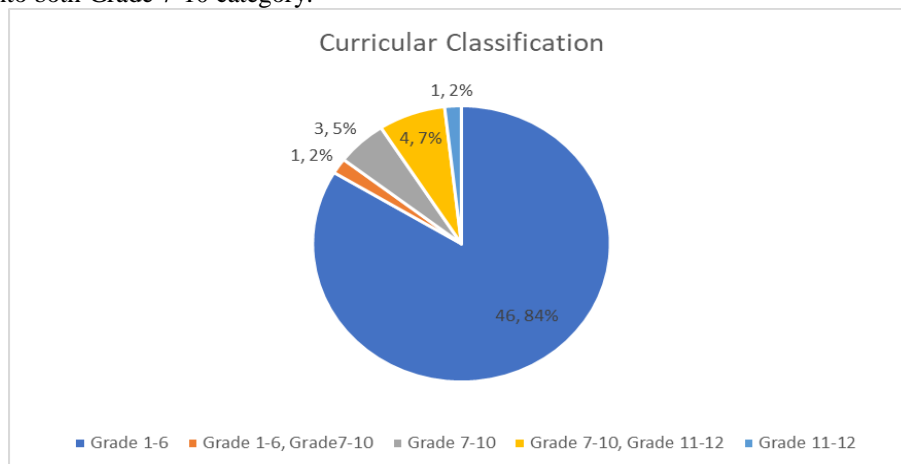
The data revealed that out of the total sample, 27 schools or 49% can be classified as having a medium school size. Eighteen schools or 33% were categorized as small schools, while 9 schools or 16% fell under the large school category. Interestingly, only one school, accounting for merely 2%, was identified as a very large school.



Based on these findings, it can be inferred that the majority of schools surveyed had a medium-sized population. These results connote that the analysis that would be elicited in this study would mostly speak of, but not limited to, the scenario or status within the bounds of medium size when considering their student enrolment figures and physical capacity.

4.3. Curricular Classification

The data collected clearly indicates that the majority of respondents, accounting for 46 or 84% of the total, belong to Grade 1-6. Additionally, a smaller proportion of respondents, comprising only 4 or 7%, are from Grade 7-10 and Grade 11-12 combined. Furthermore, there is a distinct group representing 3 or 5% which fall into both Grade 7-10 category.

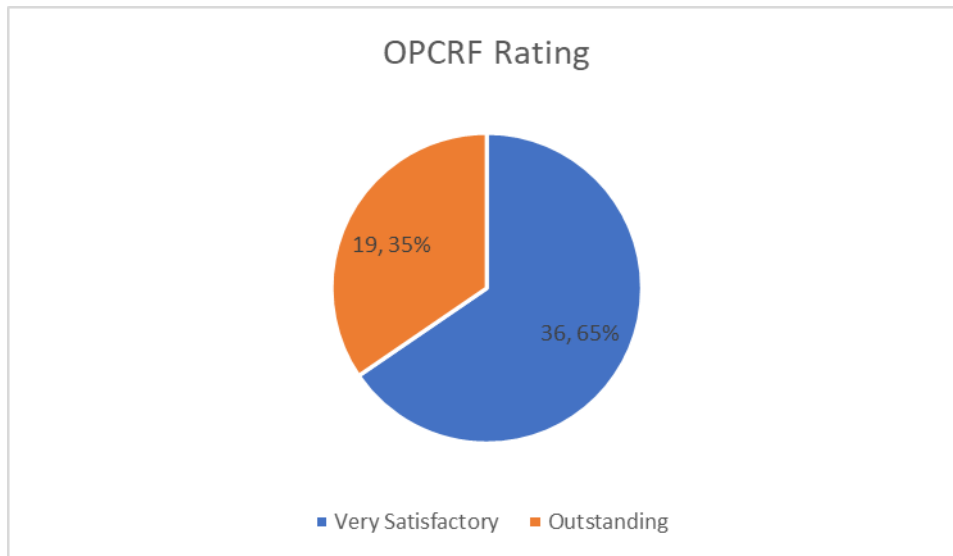


Interestingly, it was observed that Grade 1-6, 7-10 and Grade11-12 have an identical number of participants, making up merely about 1 or 2%.

This information provides valuable insights into the distribution of respondents across different grade levels within the surveyed population. The data implies that there is a considerably large concentration in Grades 1-6 among the respondents, connoting analysis of status and scenario mostly, but not limited to, the dominant number of Grades 1-6 age group.

4.4. OPCRF Rating

The data revealed that 36 public educational institutions or approximately 65% received a very satisfactory OPCRF rating, while 19 schools or roughly 35% were given an outstanding OPCRF rating.



This significant statistical breakdown indicates the varying levels of performance exhibited by schools within this particular evaluation framework. It showcases a substantial number of educational institutions achieving remarkable results and being recognized for their exceptional contributions. Additionally, it highlights a majority who have demonstrated commendable competence and proficiency in their respective roles. These findings validate the effective provision of rewards through current evaluation system in identifying and acknowledging high-performing individuals/schools as well as those who consistently meet expectations with excellence across various domains within the organizational structure.

4.5. Numeracy Skill in Terms of Student-Related Factor

Indicators	Mn	SD	Interpretation
1. Students do well in Mathematics.	3.38	0.59	Moderate Level
2. Students do extra effort to learn Mathematics.	3.62	0.68	High Level
3. Students listen attentively to the lecture of their teacher.	3.84	0.57	High Level
4. Students actively participate in the discussion, answering exercises and/or clarifying things they did not understand.	3.80	0.65	High Level
5. Students feel excited and energetic during Math lessons.	3.76	0.72	High Level
6. Students prepare and study for quizzes and tests.	3.65	0.70	High Level
7. Students use reference materials (e.g. books, internet, others) while they are learning.	3.64	0.73	High Level
Average	3.67	0.66	High Level

Legend:	4.21-5.00	Very High Level
	3.41 – 4.20	High Level
	2.61 – 3.40	Moderate Level
	1.81 – 2.60	Low Level
	1.00 – 1.80	Very Low Level

From the statements above, “Students listen attentively to the lecture of their teacher” yielded the highest mean score ($M=3.84$, $SD=0.57$) and was remarked as High. This is followed by “Students actively participate in the discussion, answering exercises and/or clarifying things they did not understand” with a mean score $M= 3.80$ ($SD=0.65$) and was remarked as High. On the other hand, the statement “Students do well in Mathematics” received the lowest mean score of responses with $M=3.38$, $SD=0.59$, yet receiving a remark Moderate.

The level of numeracy skill in terms of student-related factor attained a weighted mean score of 3.67, standard deviation of 0.66, and an equivalent remark of High Level as a status of the 55 participating schools.

The data underscores a salient observation regarding the students of the schools under examination: they possess a strong aptitude for numerical proficiency. The ability to comprehend and utilize numerical information proficiently can be likened to acquiring advantageous strategies that can be applied to navigate various aspects of life. Proficiency in mathematical skills facilitates effective management of finances, interpretation of graphical data, and the ability to make informed and rational decisions. The results exhibited a minimal deviation from the mean (standard deviation of less than 1), indicating that the majority of schools has students demonstrating proficient comprehension and problem-solving skills within a reasonable timeframe.

4.6. Numeracy Skill in Terms of Environmental Factor

Indicators	Mn	Sd	Interpretation
1. Classrooms are free from noise and disturbance.	4.22	0.60	Very High Level
2. Learners are interested by visual items inside the classroom.	4.11	0.76	High Level
3. The arrangement of seats in the classroom is appropriate.	4.20	0.73	High Level
4. The good atmosphere in the classroom motivates the learners.	4.22	0.66	Very High Level
5. The learners are pleased with the classroom physical condition.	4.13	0.72	High Level
6. The immediate family help learners in their math assignments.	3.53	0.86	High Level
7. Learners are comfortable in studying at home.	3.60	0.89	High Level
8. The learners prefer finishing and studying their assignments first before watching any television program.	3.42	0.79	High Level
9. During the time of learning, parents/guardians excuses their child in doing household chores.	3.45	0.83	High Level
Average	3.87	0.76	High Level

Legend:	4.21-5.00	Very High Level
	3.41 – 4.20	High Level
	2.61 – 3.40	Moderate Level
	1.81 – 2.60	Low Level
	1.00 – 1.80	Very Low Level

From the statements above, “Classrooms are free from noise and disturbance” and “The good atmosphere in the classroom motivates the learners” yielded the highest mean score ($M=4.22$, $SD=0.60$ and 0.66 respectively) and were remarked as Very High. This is followed by “The arrangement of seats in the classroom is appropriate” with a mean score $M= 4.20$ ($SD=0.73$) and was remarked as High. On the other hand, the statement “The learners prefer finishing and studying their assignments first before watching any television program” received the lowest mean score of responses with $M=3.42$, $SD=0.79$, and yet remarked as High.

The level of numeracy skill in terms of environmental factor attained a weighted mean score of 3.87, a standard deviation of 0.76, and an equivalent remark of High Level as a status of the 55 participating

schools.

The influence of environmental factors on developing numerical proficiency is indeed substantial. When it comes to numeracy skills, the role played by the environment in shaping individuals' abilities is essential. Achieving a high score in numeracy skill despite potential challenges from external factors highlights the resilience and adaptability of schools and individuals when it comes to acquiring mathematical prowess.

4.7. Numeracy Skill in Terms of Teacher Factor

Indicators	Mn	SD	Interpretation
1. The teacher explains the lesson clearly.	4.49	0.50	Very High Level
2. The teacher uses teaching aids/devices.	4.45	0.54	Very High Level
3. The teacher imposes proper discipline.	4.47	0.57	Very High Level
4. The teacher is open to suggestions and opinions of learners, parents and school superiors.	4.53	0.50	Very High Level
5. The teacher is organized in presenting the lesson.	4.38	0.56	Very High Level
6. The teacher's method of teaching fits the students' style of learning.	4.18	0.64	High Level
7. The teacher easily reach out whenever there are students' difficulties with the lesson.	4.24	0.58	Very High Level
8. The teacher provides various activities.	4.35	0.62	Very High Level
9. The teacher encourages cooperation and participation.	4.55	0.50	Very High Level
10. The teacher makes lessons interesting.	4.42	0.60	Very High Level
Average	4.40	0.57	Very High Level

Legend:	4.21-5.00	Very High Level
	3.41 – 4.20	High Level
	2.61 – 3.40	Moderate Level
	1.81 – 2.60	Low Level
	1.00 – 1.80	Very Low Level

From the statements above, “The teacher encourages cooperation and participation” yielded the highest mean score ($M=4.55$, $SD=0.50$) and was remarked as Very High. This is followed by “The teacher is open to suggestions and opinions of learners, parents and school superiors” with a mean score $M= 4.53$ ($SD=0.50$) and was remarked as Very High. On the other hand, the statement “The teacher’s method of teaching fits the students’ style of learning” received the lowest mean score of responses with $M=4.18$ ($SD=0.64$), and yet received an equivalent High remark.

The level of numeracy skill in terms of teacher factor attained a weighted mean score of 4.40, a standard deviation of 0.57, and an equivalent remark of Very High Level as a status of the 55 participating schools.

In this context, it indicates that based on the data provided, there is a strong indication of a very high impact on numeracy skills attributed to teachers. This implies that most individuals can possess an advanced level of numeracy skill due to effective teaching methods or instructional strategies employed by their teachers. The term "Very High" denotes exceptional achievement in terms of numeracy skills acquired under the influence and guidance of educators.

4.8. Literacy Skill in Terms of Student-Related Factor

Indicators	Mn	SD	Interpretation
1. Students are able to identify and manipulate individual sounds in spoken words.	3.73	0.68	High Level
2. Students understand that there are systematics and predictable relationships between written letters and spoken sounds.	3.60	0.68	High Level
3. Students can apply reading skills in a rapid and fluent manner.	3.47	0.79	High Level
4. Students have a strong vocabulary coupled with syntactic and grammatical skills.	3.33	0.86	Moderate Level
5. Students have a good comprehension and the ability to relate reading to their own experiences.	3.35	0.84	Moderate Level

6. Students do extra effort to learn Reading/English.	3.56	0.74	High Level
7. Students listen attentively to the lecture of their teacher.	3.89	0.66	High Level
8. Students actively participate in the discussion, answering exercises and/or clarifying things they did not understand.	3.80	0.73	High Level
9. Students feel excited and energetic during Reading/English lessons.	3.78	0.71	High Level
10. Students prepare and study for quizzes and tests.	3.64	0.70	High Level
Average	3.60	0.75	High Level

Legend:	4.21-5.00	Very High Level
	3.41 – 4.20	High Level
	2.61 – 3.40	Moderate Level
	1.81 – 2.60	Low Level
	1.00 - 1.80	Very Low Level

From the statements above, “Students listen attentively to the lecture of their teacher” yielded the highest mean score ($M=3.89$, $SD=0.66$) and was remarked as High. This is followed by “Students actively participate in the discussion, answering exercises and/or clarifying things they did not understand” with a mean score $M=3.80$ ($SD=0.73$) and was remarked as High. On the other hand, the statement “Students have a strong vocabulary coupled with syntactic and grammatical skills” received the lowest mean score of responses with $M=3.33$ ($SD=0.86$), and still received a remark of Moderate.

The level of literacy skill in terms of student-related factor attained a weighted mean score of 3.60, a standard deviation of 0.75, and an equivalent remark of High Level as a status of the 55 participating schools.

This finding emphasizes the significance of fostering strong reading and comprehension abilities among students. Literacy skills serve as fundamental building blocks for academic success and personal growth. They enable individuals to effectively communicate ideas, understand complex texts, critically analyze information, and engage in lifelong learning opportunities. A high level of literacy empowers students to navigate various challenges within their educational journey and equips them with essential skills needed for future endeavors in higher education or professional careers. Therefore, it is imperative that educators prioritize promoting literacy development through targeted instruction tailored to meet individual needs while also encouraging a love for reading and continuous improvement in this vital area.

4.9. Literacy Skill in Terms of Environmental Factor

Indicators	Mn	SD	Interpretation
1. Classrooms are free from noise and disturbance.	4.22	0.60	Very High Level
2. Learners are interested by visual items inside the classroom.	4.24	0.64	Very High Level
3. The arrangement of seats in the classroom is appropriate.	4.24	0.64	Very High Level
4. The good atmosphere in the classroom motivates the learners.	4.24	0.61	Very High Level
5. The learners are pleased with the classroom physical condition.	4.18	0.64	High Level
6. The immediate family help learners in their math assignments.	3.76	0.88	High Level
7. Learners are comfortable in studying at home.	3.71	0.90	High Level
8. The learners prefer finishing and studying their assignments first before watching any television program.	3.71	0.85	High Level
9. During the time of learning, parents/guardians excuse their child in doing household chores.	3.60	0.89	High Level
Average	3.99	0.74	High Level

Legend:	4.21-5.00	Very High Level
	3.41 – 4.20	High Level
	2.61 – 3.40	Moderate Level
	1.81 – 2.60	Low Level
	1.00 – 1.80	Very Low Level

From the statements above, “Learners are interested by visual items inside the classroom”, “The arrangement of seats in the classroom is appropriate”, and “The good atmosphere in the classroom motivates the learners” yielded the highest mean score ($M=4.24$, $SD=0.61$) and was remarked as Very High. This is

followed by “Classrooms are free from noise and disturbance” with a mean score $M=4.22$ ($SD=0.60$) and was remarked as Very High. On the other hand, the statement “During the time of learning, parents/guardians excuse their child in doing household chores” received the lowest mean score of responses with $M=3.60$ ($SD=0.89$), but still received a High remark.

The level of literacy skill in terms of environmental factor attained a weighted mean score of 3.99, a standard deviation of 0.74, and an equivalent remark of High Level as a status of the 55 participating schools.

This underscores the significance of considering environmental aspects when assessing literacy levels within a population. Environmental factors encompass various elements such as access to educational resources, socio-economic conditions, cultural influences, and support systems available within one's surroundings. Understanding these factors helps people comprehend why certain individuals may excel or struggle with their literacy skills based on their environment's advantages or limitations. By acknowledging and addressing these environmental influences on literacy skills, people can work towards enhancing overall education outcomes for everyone involved in fostering inclusive learning environments conducive to individual growth and development.

4.10. Literacy Skill in Terms of Teacher Factor

Indicators	Mn	SD	Interpretation
1. The teacher explains the lesson clearly.	4.35	0.52	Very High Level
2. The teacher uses teaching aids/devices.	4.35	0.55	Very High Level
3. The teacher imposes proper discipline.	4.36	0.59	Very High Level
4. The teacher is open to suggestions and opinions of learners, parents and school superiors.	4.36	0.59	Very High Level
5. The teacher is organized in presenting the lesson.	4.35	0.55	Very High Level
6. The teacher's method of teaching fits the students' style of learning.	4.15	0.62	High Level
7. The teacher easily reach out whenever there are students' difficulties with the lesson.	4.27	0.56	Very High Level
8. The teacher provides various activities.	4.33	0.61	Very High Level
9. The teacher encourages cooperation and participation.	4.40	0.53	Very High Level
10. The teacher makes lessons interesting.	4.40	0.56	Very High Level
Average	4.33	0.57	Very High Level

Legend:	4.21-5.00	Very High Level
	3.41 – 4.20	High Level
	2.61 – 3.40	Moderate Level
	1.81 – 2.60	Low Level
	1.00 – 1.80	Very Low Level

From the statements above, “The teacher encourages cooperation and participation” and “The teacher makes lessons interesting” yielded the highest mean score ($M=4.40$, $SD=0.56$) and was remarked as Very High. This is followed by “The teacher imposes proper discipline” and “The teacher is open to suggestions and opinions of learners, parents and school superiors” with a mean score $M=4.36$ ($SD=0.59$) and was remarked as Very High. On the other hand, the statement “The teacher's method of teaching fits the students' style of learning” received the lowest mean score of responses with $M=4.15$ ($SD=0.62$), but still remarked as High.

The level of literacy skill in terms of teacher factor attained a weighted mean score of 4.33, a standard deviation of 0.57, and an equivalent remark of Very High Level as a status of the 55 participating schools.

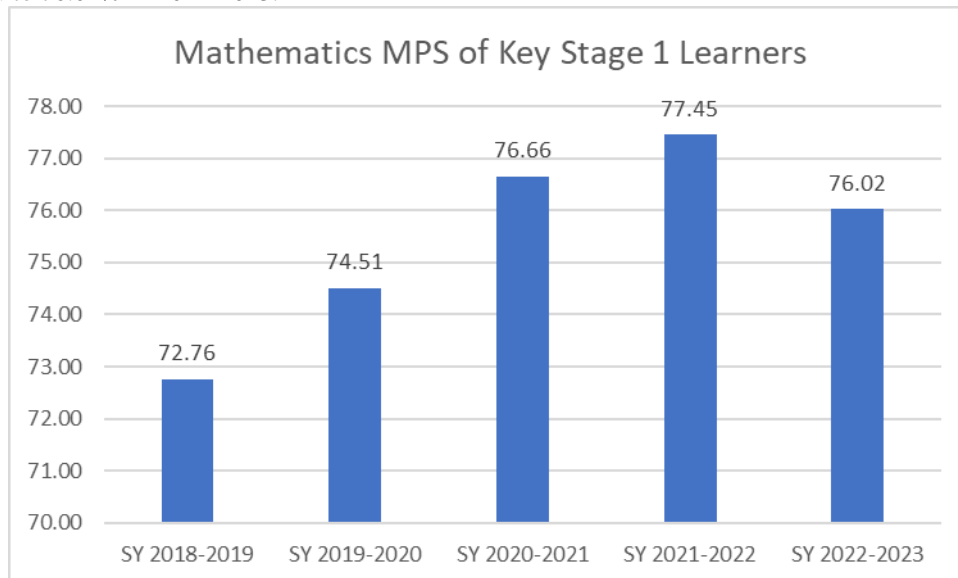
This emphasizes the significance of educators in fostering and enhancing students' literacy skills. Teachers play a vital role in nurturing language proficiency by employing effective teaching strategies, providing guidance, and creating an engaging learning environment that promotes critical thinking and communication skills. A highly literate society is essential for personal growth, social development, economic progress, and democratic participation. Thus, these findings underscore the crucial responsibility that falls upon teachers to continually strive for excellence in their profession as they shape future generations'

educational foundation through their expertise and dedication to promoting literacy skills among students.

4.11. Mathematics Mean Percentage Score of Key Stage 1 Learners

The graph vividly illustrates the notable change in the Mathematics mean percentage score of key stage 1 learners over a span of five academic years, from 2018 to 2023.

In the year 2018-2019, students achieved an average score of 72.76%, showing their commendable grasp of mathematical concepts at this early stage. Building upon this foundation, their performance increased in 2019-2020 with a percentage of 74.51%. This change persisted into the subsequent academic year as learners got a remarkable mean percentage score of 76.66% in 2020-2021. On the other hand, in year 2021-2022, their mean percentage in mathematics increased to 77.45%. Meanwhile, their mean percentage decreased to 76.02% in 2022-2023.



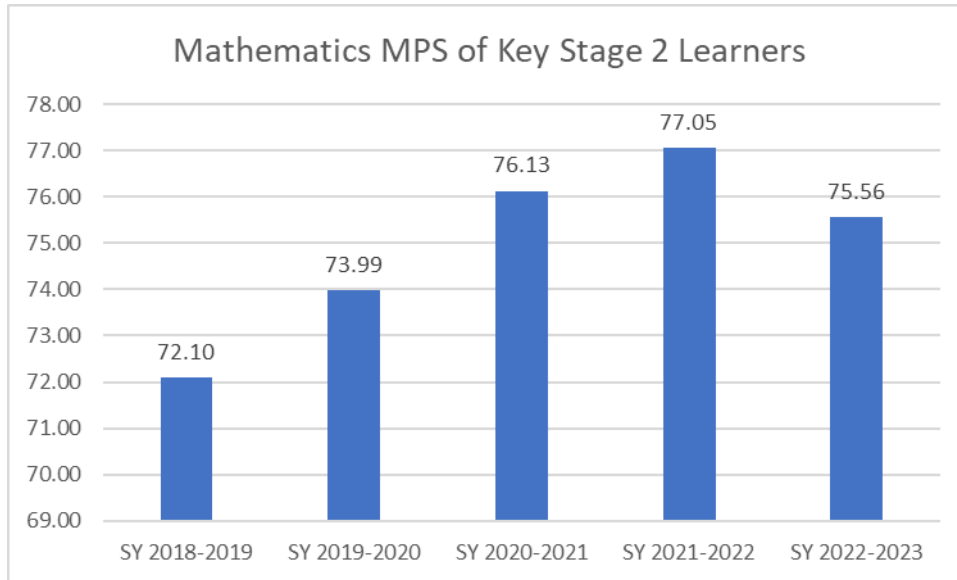
It implies that the students displayed a substantial comprehension of mathematical concepts at the initial stage, laying a solid foundation in the subject. As the years progressed, the students were able to build on this base, exhibiting a continual improvement in their numeracy skills. While the students are making great progress and have a strong mathematical foundation, there is a need for consistent support and possibly some new strategies to help them maintain and even improve their performance, especially when they encounter more difficult material or other difficulties. It stresses the importance of continuous learning and adaptation in the educational journey, showing that with the right help and resources, students can overcome obstacles and continue to advance in their knowledge and grasp of numeracy.

4.12. Mathematics Mean Percentage Score of Key Stage 2 Learners

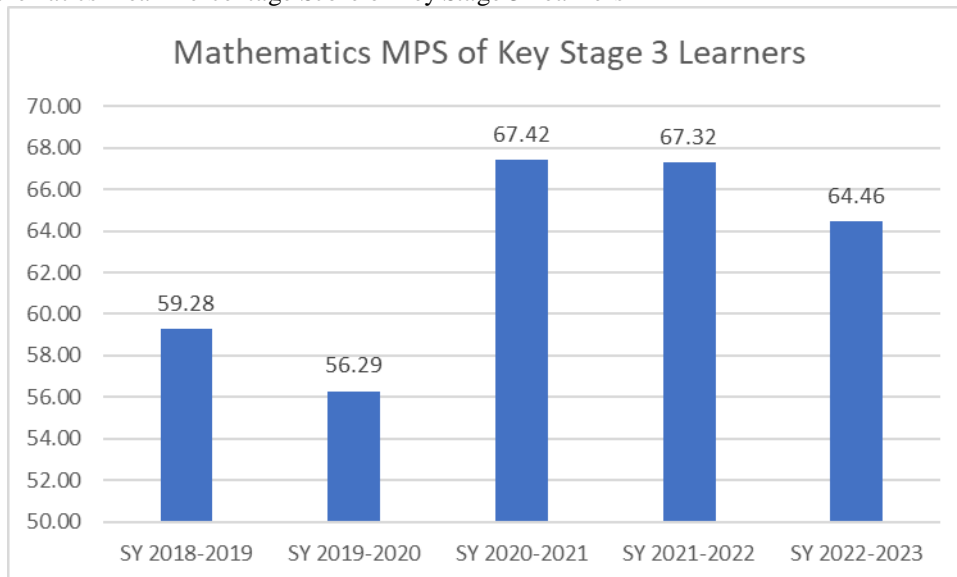
The graph provides a clear representation of the Mathematics mean percentage score achieved by key stage 2 learners over a five-year period. Starting from the academic year 2018-2019, the initial recorded percentage was 72.10, indicating an average performance in Mathematics for that cohort. Subsequently, the following year showed a slight improvement with a mean score of 73.99 in 2019-2020. The trend continued upwards as the scores reached 76.13 in the academic year of 2020-2021 and further climbed to 77.05 in 2021-2022, showcasing steady progress and growth among these learners' mathematical abilities over time. However, there was a small decline observed in their performance during the most recent academic year

(2022-2023), where they achieved an average score of 75.56 percent in Mathematics proficiency.

It implies that as time went on, learners kept getting better and better, understanding more about Mathematics. However, in the year 2022-2023, their performance somewhat declined. It means that while the learners are generally doing well and improving, there are times when they might struggle, and that's when they will need extra support and help to get back on track. It's crucial for teachers and parents to pay attention to these changes in performance, find out what's causing them, and come up with ways to help the learners overcome academic struggles. This way, they can continue to learn and grow in Math and keep advancing on their numeracy skills.



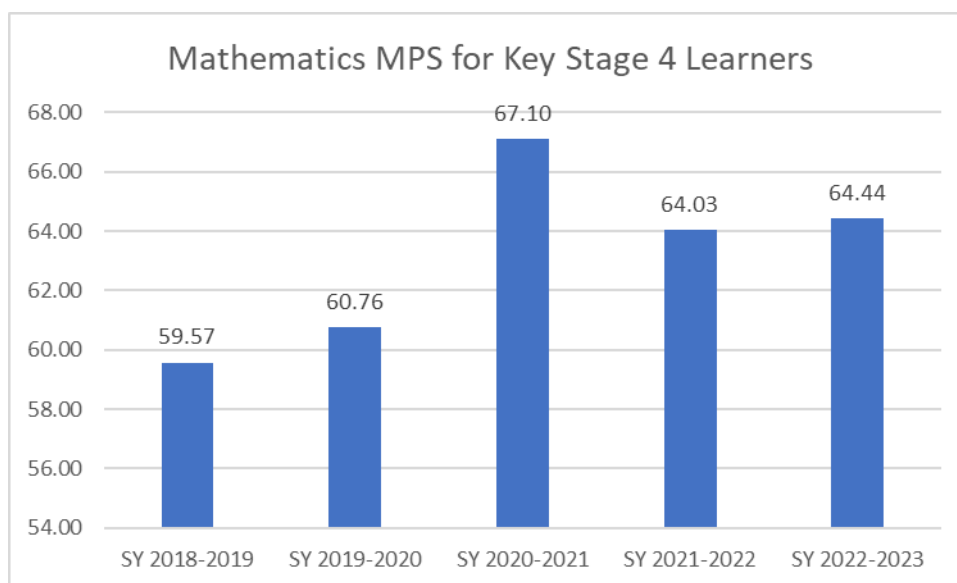
4.13. Mathematics Mean Percentage Score of Key Stage 3 Learners



The graph illustrates the mean percentage score in Mathematics for key stage 3 learners over a span of five years. In the academic year 2018-2019, the mean score stood at 59.28%, indicating the average performance of students in this subject during that period. However, there was a slight decline observed in the following year as the mean percentage dropped to 56.29% for 2019-2020. Nevertheless, there was a significant improvement witnessed in Mathematics scores for key stage 3 learners during the academic year 2020-2021, with a notable increase to a mean percentage of 67.42%. There was a minor decline seen in the subsequent academic year (2021-2022), where the mean score dipped slightly to 67.32%. Meanwhile, it is estimated that in the academic year of 2022-2023, there was another slight decrease noted with a mean percentage score of 64.46%.

The variations in mean percentage scores across the years highlight the complex nature of learning, with periods of progress and setbacks reflecting the continuous interaction between different learning activities, teaching methods, student motivations, and external influences. The small fluctuations in scores emphasize the importance of being flexible, resilient, and constantly evaluating educational strategies to create a supportive and enriching learning environment that facilitates long-term growth and development in mathematical understanding and application. This has significant implications as it calls for educational stakeholders to be attentive and proactive in addressing evolving learning needs, fostering a resilient culture that enables students to navigate challenges and uncertainties they encounter in their academic pursuit of Mathematics.

4.14. Mathematics Mean Percentage Score of Key Stage 4 Learners



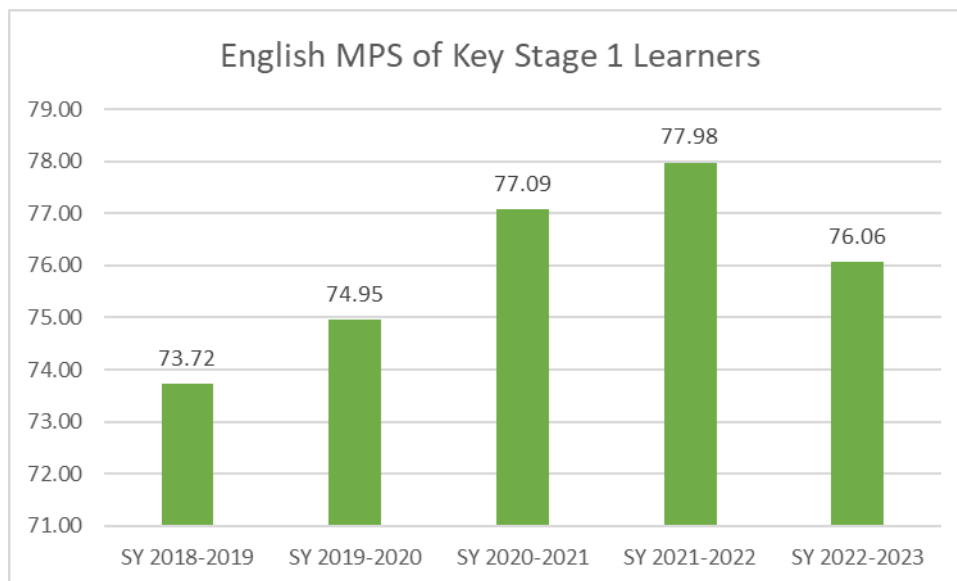
The graph provides a concise overview of the mean percentage score in Mathematics for key stage 4 learners over the span of five years. Commencing with the academic year 2018-2019, the initial recorded percentage stood at 59.57%. Progressing to the subsequent year 2019-2020, there was an increase that reached a score of 60.76%. This positive trend continues into 2020-2021 where there is a surge in scores reaching an impressive mark of 67.10%. Overall improvement remains significant as percentages consistently surpass previous mean with values of 64.03% during 2021-2022, and finally settling at 64.44% for the academic year 2022-2023.

It implies that maintaining an environment conducive to learning, together with effective teaching strategies and continuous support, can lead to sustained improvements in student outcomes. It also emphasizes

the critical role of educators, instructional designers, and academic stakeholders in fostering a learning landscape that is aligned to the diverse needs and potentials of learners, facilitating their performance through the areas of Mathematics with increased confidence and competence. Moreover, it emphasizes the need to maintain academic momentum through adaptive and responsive educational interventions that allow students to go deeper into mathematical studies and comprehend complicated concepts more effectively.

4.15. English Mean Percentage Score of Key Stage 1 Learners

The graph provides a clear depiction of the English mean percentage score achieved by key stage 1 learners over the span of five years. Starting from 2018-2019, an initial score of 73.72% was observed. Progressing into the following academic year, there was a noticeable increase in achievement with a percentage score of 74.95% for 2019-2020. This positive trend continued in 2020-2021, as the mean percentage score rises to 77.09%, indicating further improvement among learners. This change persisted with percentage reaching 77.98% and then slightly declining to 76.06% for the next school year (2022-2023).

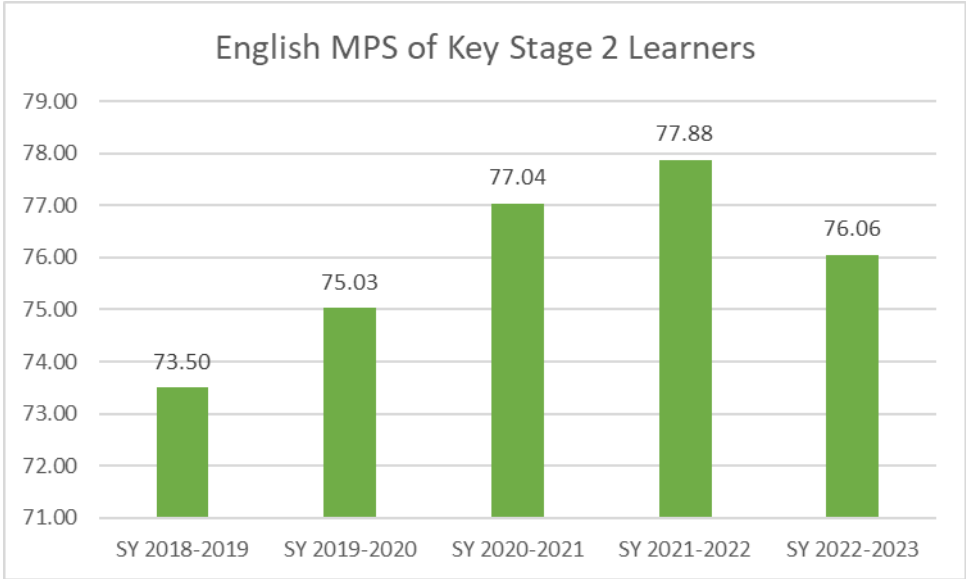


This data, graphically presented, effectively showcases the performance undertaken by key stage 1 learners over a span of five years. Their unwavering commitment to progress in the English language curriculum is evident through their consistent efforts and noteworthy advancements. The graph serves as a visual representation of the collective determination and curiosity displayed by these young learners, who have eagerly embraced opportunities to explore the depths of English and hone their linguistic abilities. The performance of the learners will increase if there is adequate support provided in the next years.

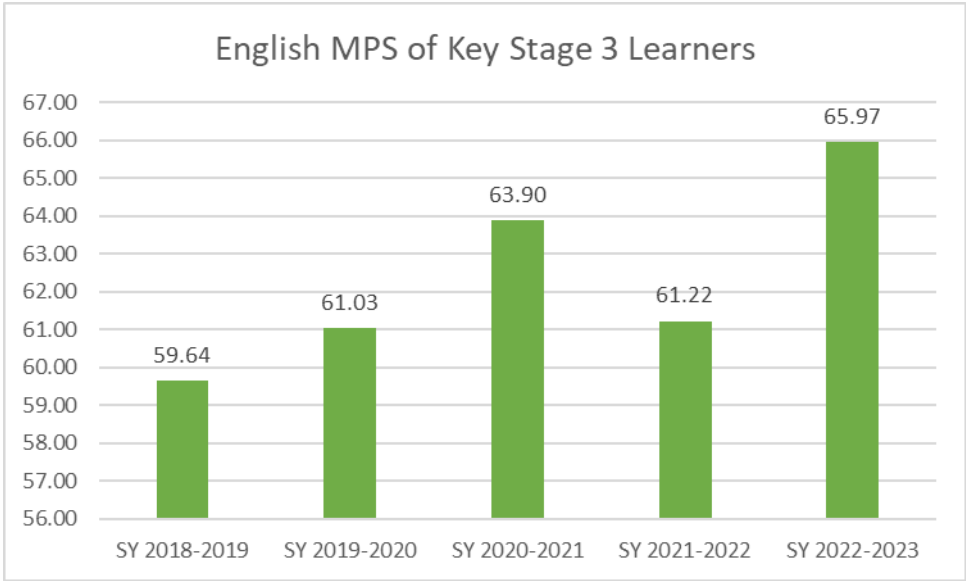
4.16. English Mean Percentage Score of Key Stage 2 Learners

The graph provides a concise overview of the English mean percentage scores achieved by key stage 2 learners over a span of five years. To elucidate, in the academic year 2018-2019, the average score stood at 73.50 percent. Subsequently, there was an encouraging improvement as evidenced by the rise to 75.03 percent during 2019-2020. The upward change continued; specifically, a score of 77.04 percent was attained in 2020-2021 and further improved to reach 77.88 percent in 2021-2022. However, in the most recent year displayed on the graph (2022-2023), there was a slight decline but still maintaining performance with an average score of 76.06%.

It implies that even though there was a slight decline in performance during the last recorded year, it clearly emphasizes an ongoing dedication to learning and a strong understanding of English among key stage 2 learners. Consequently, this indicates the effectiveness of the teaching methods utilized, the significance of the curriculum in promoting language proficiency, and the supportive learning environment that promotes holistic growth for these students. To continue the progress of the learners in English, an effective instruction should be maintained.



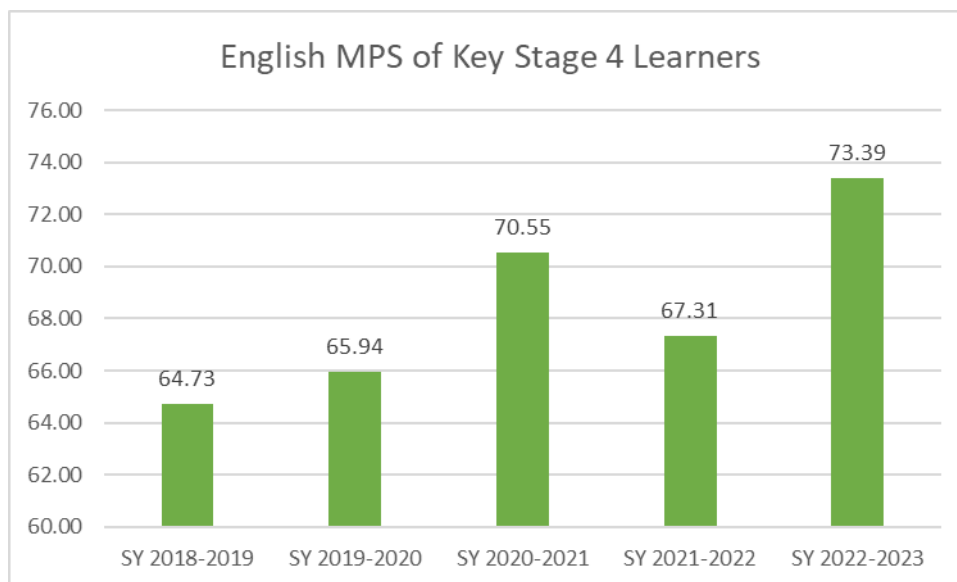
4.17. English Mean Percentage Score of Key Stage 3 Learners



The graph provides a concise representation of the academic progress made by students over a span of five years. Beginning in the academic year 2018-2019, the English mean percentage score stood at 59.64%. This figure saw a slight improvement in the subsequent year, as it rose to 61.03% in 2019-2020. The following academic year, marked by 2020-2021, witnessed a more substantial increase in scores with an impressive leap to 63.90%. However, in the succeeding year (2021-2022), the mean percentage score dropped slightly to 61.22. Finally, students achieved a mean percentage score of 65.97% in the most recent recorded year (2022-2023).

The figure implies that the students' advancement in English language acquisition throughout a five-year period has been characterized by resilience and continuous growth, despite encountering occasional obstacles. Based on the initial findings, it appears that the students exhibited a favorable reaction to the instructional approaches and educational resources utilized, indicating their capacity to adjust and a promising potential for advancement in their English language skills. The initial progress observed suggests their adaptability and positive receptiveness to the instructional methods and educational resources provided. During this time, they are highly motivated to acquire new knowledge and skills, particularly in enhancing their proficiency in the English language. Teachers should firmly believe to their students' inherent potential for continuous growth and improvement.

4.18. English Mean Percentage Score of Key Stage 4 Learners



The graph provided illustrates the English mean percentage scores achieved by key stage 4 learners over a five-year period. Beginning in the academic year 2018-2019, students attained an average score of 64.73%. There was a slight improvement in the next year, with the percentage rising to 65.94% in 2019-2020. However, it is noteworthy that significant progress was made during the 2020-2021 academic year, as learners obtained an impressive mean score of 70.55%. The following year witnessed a minor decline in performance, resulting in a score of 67.31% for the year in 2021-2022. There was substantial growth once again during the most recent recorded period of study (2022-2023), where students displayed achievement with a mean score of 73.39%.

It implies that throughout the five-year period, key stage 4 learners generally exhibited a positive trend in their English mean percentage scores, demonstrating their developing proficiency and understanding in the subject. The gentle improvement from the first to the second year suggests a steady but moderate

enhancement in learning outcomes, perhaps due to increasing familiarity with the curriculum and gradual acquisition of skills. This all means that the learning journey of students has had its ups and downs but showed that with effort, they can improve. Even though the performance of the learners gradually improved, further support is needed for them to continuously thrive in the upcoming years.

4.19. Mathematics Mean Percentage Score across School Type

The table depicts the ANOVA test result of the mean difference of Mathematics MPS between Rural and Urban schools in Region IV-A CALABARZON. It can be seen that Rural schools' MPS has higher mean and lower standard deviation compared to Urban school's MPS. Nevertheless, this difference is observed to be not significant because the F-value (2.279) is lower than the F-critical value (4.02). This is supported by the P-value (0.137) which is higher than the alpha value (0.05). With 95% level of confidence, it can be said that there is not enough evidence to claim that there is a significant difference between the Mathematics MPS of rural and urban schools.

School Type	n	Mean	SD	F-value	F-crit	P-value	Decision
Rural	46	75.07	7.57	2.279	4.02	0.137	Not Significant
Urban	9	70.75	9.25				

alpha = 0.05

4.20. Mathematics Mean Percentage Score across School Size

School Size	n	Mean	SD	F-value	F-crit	P-value	Decision
Small	18	78.29	3.81	8.203	3.17	0.001	Significant
Medium	27	74.46	6.85				
Large/Very Large	10	67.02	11.15				

alpha 0.05

The table depicts the ANOVA test result of the mean difference of Mathematics MPS across school size in Region IV-A CALABARZON. It can be seen that small size schools' MPS has the highest mean and lowest standard deviation compared to medium and large/very large schools' MPS. Moreover, the MPS of large/very large schools has the lowest mean and highest standard deviation. This difference is observed to be significant because the F-value (8.203) is higher than the F-critical value (3.17). This is supported by the P-value (0.001) which is lower than the alpha value (0.05). With 95% level of confidence, it can be said that there is enough evidence to claim that there is a significant difference in the Mathematics MPS across different school size.

4.21. Mathematics Mean Percentage Score across Curricular Classification

Curricular Classification	N	Mean	SD	F-value	F-crit	P-value	Decision
Key Stage 1 and 2	47	75.84	6.32	4.843	2.78	0.005	Significant
Key Stage 3	2	63.98	17.57				
Key Stage 3 and 4	4	64.44	6.83				
Key Stage 4	2	69.78	19.05				

alpha = 0.05

The table depicts the ANOVA test result of the mean difference of Mathematics MPS across curricular classification in Region IV-A CALABARZON. It can be seen that the MPS of schools offering Key Stages 1 and 2 has the highest mean and lowest standard deviation compared schools offering different key stages of learning. Moreover, the MPS of schools offering Key Stage 3 has the lowest mean, while the MPS of schools offering Key Stage 4 has the highest standard deviation. This difference is observed to be significant because the F-value (4.843) is higher than the F-critical value (2.78). This is supported by the P-

value (0.005) which is lower than the alpha value (0.05). With 95% level of confidence, it can be said that there is enough evidence to claim that there is a significant difference in the Mathematics MPS across curricular classification.

4.22. Mathematics Mean Percentage Score across OPCRf Rating

The table depicts the ANOVA test result of the mean difference of Mathematics MPS between schools' OPCRf Outstanding rating and Very Satisfactory rating in Region IV-A CALABARZON. It can be seen that schools having very satisfactory OPCRf rating has a higher mean and lower standard deviation compared to schools with Outstanding OPCRf rating. This difference is observed to be significant because the F-value (7.016) is higher than the F-critical value (4.02). This is supported by the P-value (0.011) which is lower than the alpha value (0.05). With 95% level of confidence, it can be said that there is enough evidence to claim that there is a significant difference in the Mathematics MPS between schools with Outstanding OPCRf rating and schools with Very Satisfactory OPCRf rating.

School Type	n	Mean	SD	F-value	F-crit	P-value	Decision
Outstanding	17	70.34	10.60	7.016	4.02	0.011	Significant
Very Satisfactory	38	76.16	5.71				

alpha = 0.05

4.23. English Mean Percentage Score across School Type

School Type	n	Mean	SD	F-value	F-crit	P-value	Decision
Rural	46	75.74	7.29	2.787	4.02	0.101	Not Significant
Urban	9	71.16	8.75				

alpha = 0.05

The table depicts the ANOVA test result of the mean difference of English MPS between Rural and Urban schools in Region IV-A CALABARZON. It can be seen that Rural schools' MPS has higher mean and lower standard deviation compared to Urban school's MPS. Nevertheless, this difference is observed to be not significant because the F-value (2.787) is lower than the F-critical value (4.02). This is supported by the P-value (0.101) which is higher than the alpha value (0.05). With 95% level of confidence, it can be said that there is not enough evidence to claim that there is a significant difference between the English MPS of rural and urban schools.

4.24. English Mean Percentage Score across School Size

School Size	n	Mean	SD	F-value	F-crit	P-value	Decision
Small	18	77.85	6.74	3.198	3.17	0.049	Significant
Medium	27	74.72	7.13				
Large/Very Large	10	70.55	8.95				

alpha = 0.05

The table depicts the ANOVA test result of the mean difference of English MPS across school size in Region IV-A CALABARZON. It can be seen that small size schools' MPS has the highest mean and lowest standard deviation compared to medium and large/very large schools' MPS. Moreover, the MPS of large/very large schools has the lowest mean and highest standard deviation. This difference is observed to be significant because the F-value (3.198) is higher than the F-critical value (3.17). This is supported by the P-value (0.049) which is lower than the alpha value (0.05). With 95% level of confidence, it can be said that there is enough evidence to claim that there is a significant difference in the English MPS across different school size.

4.25. English Mean Percentage Score across Curricular Classification

Curricular Classification	N	Mean	SD	F-value	F-crit	P-value	Decision
Key Stage 1 and 2	47	76.12	6.60	2.918	2.78	0.043	Significant
Key Stage 3	2	69.51	9.39				
Key Stage 3 and 4	4	66.04	9.43				
Key Stage 4	2	71.67	18.50				

alpha = 0.05

The table depicts the ANOVA test result of the mean difference of English MPS across curricular classification in Region IV-A CALABARZON. It can be seen that the MPS of schools offering Key Stages 1 and 2 has the highest mean and lowest standard deviation compared schools offering different key stages of learning. Moreover, the MPS of schools offering Key Stage 3 has the lowest mean, while the MPS of schools offering Key Stage 4 has the highest standard deviation. This difference is observed to be significant because the F-value (2.918) is higher than the F-critical value (2.78). This is supported by the P-value (0.043) which is lower than the alpha value (0.05). With 95% level of confidence, it can be said that there is enough evidence to claim that there is a significant difference in the English MPS across curricular classification.

4.26. English Mean Percentage Score across OPCRf Rating

School Type	n	Mean	SD	F-value	F-crit	P-value	Decision
Outstanding	17	72.10	8.73	3.684	4.02	0.060	Not Significant
Very Satisfactory	38	76.28	6.85				

alpha = 0.05

The table depicts the ANOVA test result of the mean difference of English MPS between schools' OPCRf Outstanding rating and Very Satisfactory rating in Region IV-A CALABARZON. It can be seen that schools having very satisfactory OPCRf rating has a higher mean and lower standard deviation compared to schools with Outstanding OPCRf rating. This difference is observed to be not significant because the F-value (3.684) is lower than the F-critical value (4.02). This is supported by the P-value (0.060) which is higher than the alpha value (0.05). With 95% level of confidence, it can be said that there is not enough evidence to claim that there is a significant difference in the English MPS between schools with Outstanding OPCRf rating and schools with Very Satisfactory OPCRf rating.

4.27. Summary of Significant Difference Tests in Mean Percentage Score across School Profile

School Profile / MPS	School Type	School Size	Curricular Classification	OPCRf Rating
Mathematics Mean Percentage Score	Not Significant	Significant	Significant	Significant
English Mean Percentage Score	Not Significant	Significant	Significant	Not Significant

The table highlights the summary of the results of test of significant differences in mean percentage score across school profile, namely school type, school size, curricular classification and OPCRf rating. For Mathematics mean percentage score, three categories of school profile showed significant influence to learners' mathematics proficiency. They are school size, curricular classification and OPCRf rating. Having a small school size entails having higher Mathematics mean percentage score. This status of school size cannot be controlled, that is, it is already given for specific communities. Population in an area is not on education sector to manipulate. Nevertheless, the significant influence of school size to Mathematics MPS connotes the importance of having the manageable student-teacher in a classroom. School size cannot be adjusted, manipulated and controlled, but the student-teacher ratio is something that the education sector can looked

into. A ratio of 25-30 students per teacher can be considered, as this is the one being suggested by educators around the globe. It was on key stages 1 and 2, on the other hand, where the highest Mathematics MPS ensued, compared to other key stages. Curricular classification, once again, is another school profile that cannot be adjusted, manipulated or controlled. But connected factors can be considered so as to lift Mathematics MPS of other key stages to the status that key stages 1 and 2 has. These factors can be the teachers' patience, resourcefulness, flexibility, commitment, teaching strategy, and even passion for rearing children. Meanwhile, it is interesting to note that schools with OPCR rating of very satisfactory resulted into a better Mathematics MPS than those schools with outstanding OPCR rating. It can be reasoned out on the focus of the school whether it is on quality, equity, governance, resilience or well-being. If the target is to have higher MPS, schools should provide extra effort, projects and programs on quality. But this doesn't mean that other aspects will be neglected. While schools are focusing on equity, governance, resilience and well-being, the aspect on quality should never be neglected. If these would not be given attention, the results of the study made by by Betthäuser, Bach-Mortensen and Engzell (2023) showing greater deficiency of Math skills compared to English skills brought about by pandemic would entail a perennial problem even in this post-pandemic situation.

Meanwhile, for English mean percentage score, it was found out that 2 out of the school profile under investigation in this study significantly influences the said variable. They are school size and curricular classification. Just like in the area of Mathematics, it can be observed that small schools have perform best compared to other school size. Since this factor cannot be adjusted, manipulated or controlled, it is important to look into the aspect of student-teacher ratio. Small ratio would entail better transfer of knowledge and competency, better learning engagement, better academic guidance and monitoring, and better learning outcome. Key stages 1 and 2, just like in the case of Mathematics, has the highest English MPS compared to others schools with other curricular classification. The classroom environment, curriculum strategy and teacher commitment can be considered on this aspect so as to gain lesson on how key stages 1 and 2 produces better learning outcome in English than other key stages. Byant, Dorn and Sarakatsannis (2023) assessment of leveraging back to norm for Grade 4 Reading being a very long 22 years is a challenge for Filipino educators on what can be done to the student-teacher ratio and the teachers' commitment so as to recover from the loss incurred by the previous pandemic.

4.28. Student-Related Factor and Mathematics Mean Percentage Score

Variables	Mn	SD	r-value	r-crit	P-value	Decision
Student-Related Factor	3.67	0.54	0.195	0.272	0.153	Not Significant
Math MPS	74.36	7.94				

$\alpha = 0.05$

The table highlights the Pearson-R treatment result of the correlation of student-related factor to the Mathematics mean percentage score (MPS). It can be seen that there is a little correlation between the two variables as indicated by the r-value (0.195). Because the r-value is less than the r-critical value (0.272), it can be said that there is no significant correlation between student-related factor and Mathematics MPS. This is supported by the P-value 0.153 which is greater than the alpha value (0.05). With 95% level of confidence, it can be noted that there is not enough evidence to claim that there is significant correlation between student-related factor and Mathematics MPS.

4.29. Environmental Factor and Mathematics Mean Percentage Score

Variables	Mn	SD	r-value	r-crit	P-value	Decision
Environmental Factor	3.87	0.59	0.187	0.272	0.153	Not Significant
Math MPS	74.36	7.94				

$\alpha = 0.05$

The table highlights the Pearson-R treatment result of the correlation of environmental factor to the Mathematics mean percentage score (MPS). It can be seen that there is a little correlation between the two variables as indicated by the r-value (0.187). Because the r-value is less than the r-critical value (0.272), it can be said that there is no significant correlation between environmental factor and Mathematics MPS. This is supported by the P-value 0.153 which is greater than the alpha value (0.05). With 95% level of confidence, it can be noted that there is not enough evidence to claim that there is significant correlation between environmental factor and Mathematics MPS.

4.30. Teacher Factor and Mathematics Mean Percentage Score

Variables	Mn	SD	r-value	r-crit	P-value	Decision
Teacher Factor	4.41	0.48	0.023	0.272	0.867	Not Significant
Math MPS	74.36	7.94				

alpha = 0.05

The table highlights the Pearson-R treatment result of the correlation of teacher factor to the Mathematics mean percentage score (MPS). It can be seen that there is a little correlation between the two variables as indicated by the r-value (0.023). Because the r-value is less than the r-critical value (0.272), it can be said that there is no significant correlation between teacher factors and Mathematics MPS. This is supported by the P-value 0.867 which is greater than the alpha value (0.05). With 95% level of confidence, it can be noted that there is not enough evidence to claim that there is significant correlation between teacher factor and Mathematics MPS.

4.31. Student-Related Factor and English Mean Percentage Score

Variables	Mn	SD	r-value	r-crit	P-value	Decision
Student-Related Factor	3.61	0.62	0.324	0.272	0.016	Significant
Math MPS	74.99	7.65				

alpha = 0.05

The table highlights the Pearson-R treatment result of the correlation of student-related factor to the English mean percentage score (MPS). It can be seen that there is a low correlation between the two variables as indicated by the r-value (0.324). Because the r-value is greater than the r-critical value (0.272), it can be said that there is a significant correlation between student-related factors and English MPS. This is supported by the P-value 0.016 which is lower than the alpha value (0.05). With 95% level of confidence, it can be noted that there is enough evidence to claim that there is significant correlation between student-related factor and English MPS.

4.32. Environmental Factor and English Mean Percentage Score

Variables	Mn	SD	r-value	r-crit	P-value	Decision
Environmental Factor	3.99	0.62	0.189	0.272	0.167	Not Significant
English MPS	74.99	7.65				

alpha = 0.05

The table highlights the Pearson-R treatment result of the correlation of environmental factor to the English mean percentage score (MPS). It can be seen that there is a little correlation between the two variables as indicated by the r-value (0.189).

Because the r-value is less than the r-critical value (0.272), it can be said that there is no significant correlation between environmental factor and English MPS. This is supported by the P-value 0.167 which is greater than the alpha value (0.05). With 95% level of confidence, it can be noted that there is not enough evidence to claim that there is significant correlation between environmental factor and English MPS.

4.33. Teacher Factor and English Mean Percentage Score

Variables	Mn	SD	r-value	r-crit	P-value	Decision
Teacher Factor	4.33	0.50	0.097	0.272	0.482	Not Significant
English MPS	74.99	7.65				

alpha = 0.05

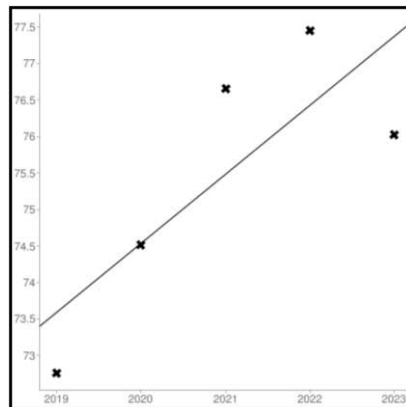
The table highlights the Pearson-R treatment result of the correlation of teacher factor to the English mean percentage score (MPS). It can be seen that there is a little correlation between the two variables as indicated by the r-value (0.097). Because the r-value is less than the r-critical value (0.272), it can be said that there is no significant correlation between teacher factor and English MPS. This is supported by the P-value 0.482 which is greater than the alpha value (0.05). With 95% level of confidence, it can be noted that there is not enough evidence to claim that there is significant correlation between teacher factor and English MPS.

4.34. Summary of Correlation Tests between Mean Percentage Score and Educational Factors

Educational Factor / MPS	Student-Related Factor	Environmental Factor	Teacher Factor
Mathematics Mean Percentage Score	Not Significant	Not Significant	Not Significant
English Mean Percentage Score	Significant	Not Significant	Not Significant

The table highlights the result of correlation tests between mean percentage score and educational factors, namely, student-related factor, environmental factor and teacher factor. Only English MPS and student-related factor was seen to be significantly correlated. As student-related factor in English is being taken-care of, English mean percentage score escalates. Learners should always be motivated, guided, morally boosted and given chanced to explore their own capability so as to produce from them the utmost in literacy. The five literacy skills lined up by Groves Learning Organization (2021), namely, phonemic awareness, alphabetic principle, applying reading skills in a rapid and fluent manner, strong vocabulary, and good comprehension, can be attained if learners' self-confidence and discipline can be boosted through the guidance of the school and family members.

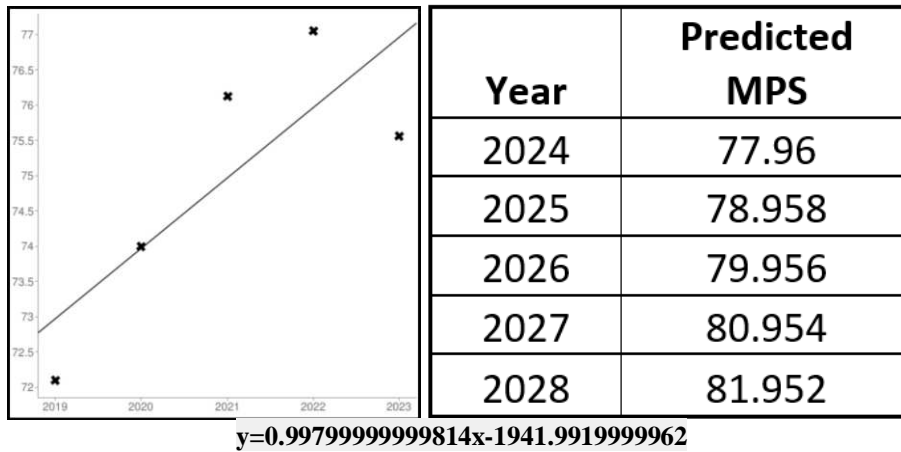
4.35. Mathematics MPS Best Line Fit of KS1 and Prediction for Next 5 Years



Year	Predicted MPS
2024	78.318
2025	79.264
2026	80.21
2027	81.156
2028	82.102

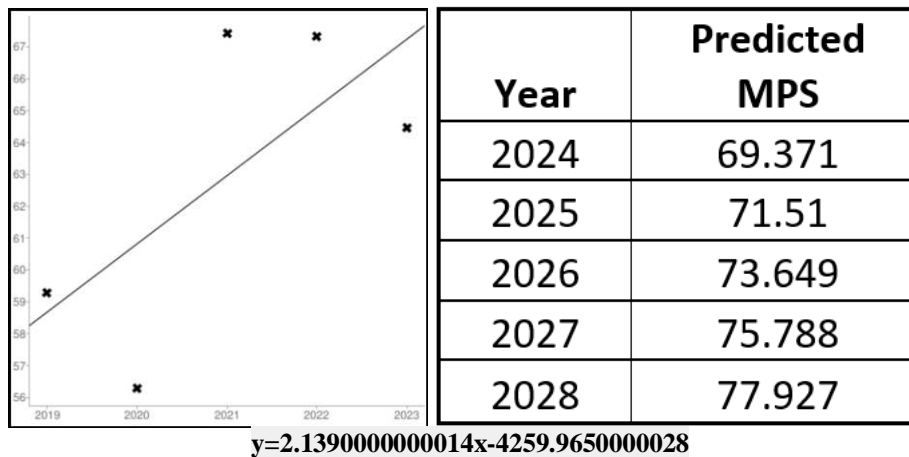
$$y = 0.9460000000792x - 1836.386000016$$

4.36. Mathematics MPS Best Line Fit of KS2 and Prediction for Next 5 Years

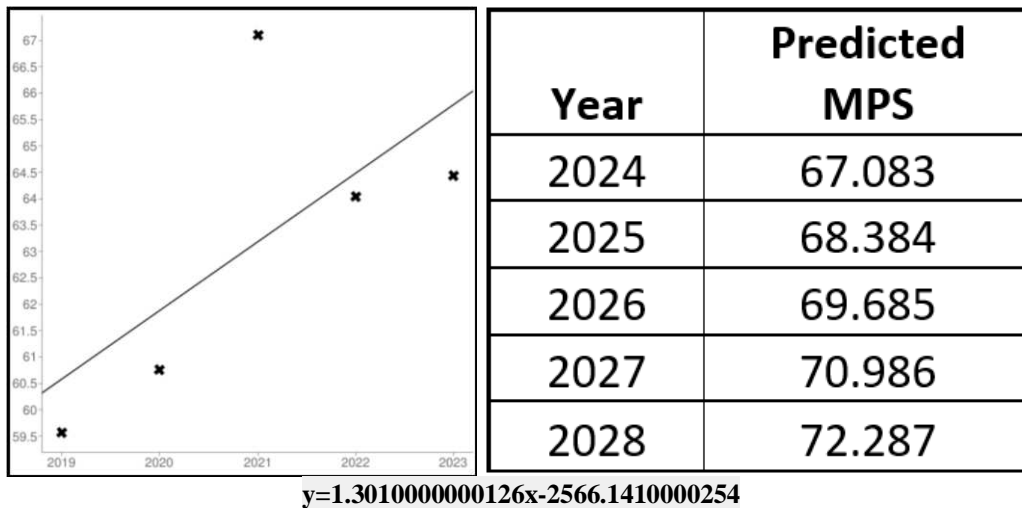


The two presentations above show the best line fit for Mathematics MPS, as generated by the previous five years data, the corresponding equation of the line, and the predicted MPS for the next five years for Key Stage 1 and 2. It can be seen that for the year 2028, the predicted Mathematics MPS for KS 1 is 82.102, while for KS 2 is 81.952.

4.37. Mathematics MPS Best Line Fit of KS3 and Prediction for Next 5 Years

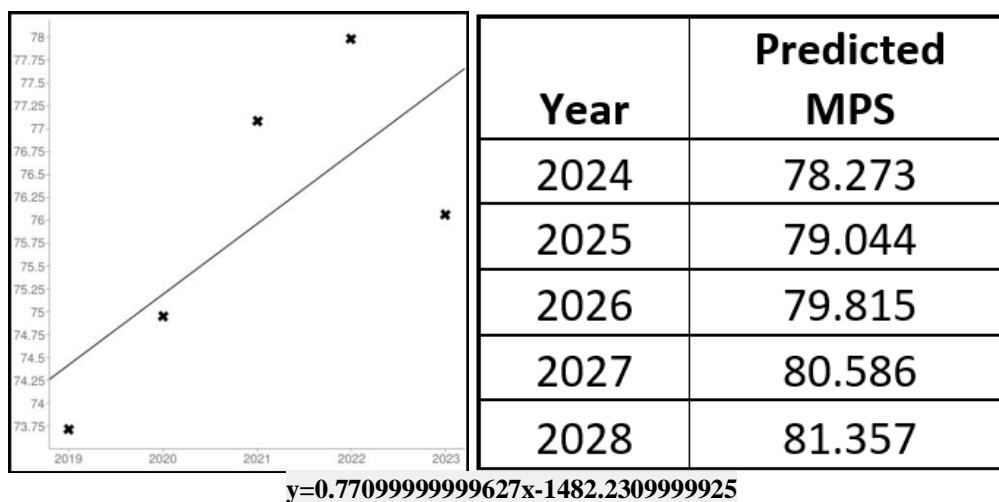


4.38. Mathematics MPS Best Line Fit of KS4 and Prediction for Next 5 Years

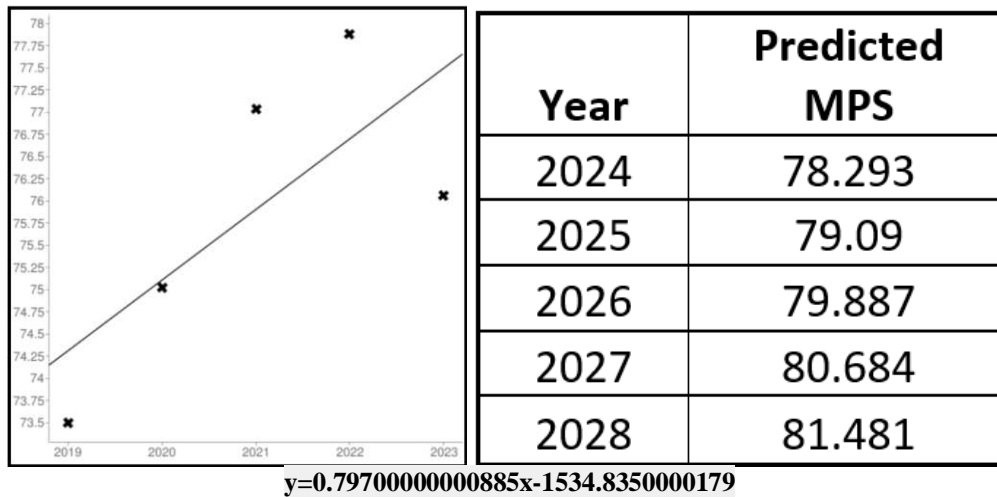


The two presentations above show the best line fit for Mathematics MPS, as generated by the previous five years data, the corresponding equation of the line, and the predicted MPS for the next five years for Key Stage 3 and 4. It can be seen that for the year 2028, the predicted Mathematics MPS for KS 3 is 77.927, while for KS 4 is 72.287.

4.39. English MPS Best Line Fit of KS1 and Prediction for Next 5 Years

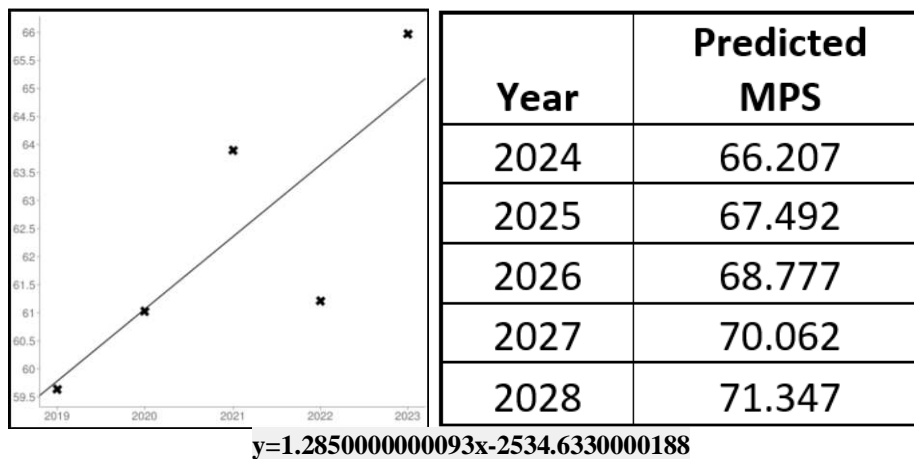


4.40. English MPS Best Line Fit of KS2 and Prediction for Next 5 Years

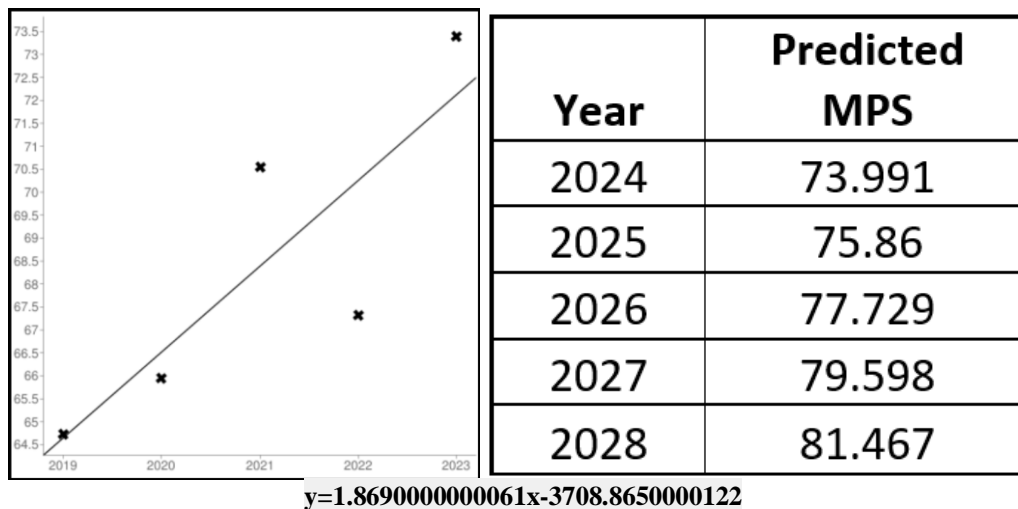


The two presentations above show the best line fit for English MPS, as generated by the previous five years data, the corresponding equation of the line, and the predicted MPS for the next five years for Key Stage 1 and 2. It can be seen that for the year 2028, the predicted English MPS for KS 1 is 81.357, while for KS 2 is 81.481.

4.41. English MPS Best Line Fit of KS3 and Prediction for Next 5 Years



4.42. English MPS Best Line Fit of KS4 and Prediction for Next 5 Years



The two presentations above show the best line fit for English MPS, as generated by the previous five years data, the corresponding equation of the line, and the predicted MPS for the next five years for Key Stage 3 and 4. It can be seen that for the year 2028, the predicted English MPS for KS 3 is 71.347, while for KS 2 is 81.467.

5. Conclusion, Recommendations and Reflection

5.1. Conclusion

This study lines up the following salient findings:

1. School size and curricular classification significantly affect numeracy skill as evidenced by Mathematics mean percentage score.
2. School size, curricular classification and OPCRf rating significantly affect literacy skill as evidenced by English mean percentage score.
3. Various educational factors are not significantly correlated to numeracy skill as evidenced by Mathematics mean percentage score.
4. Student-related factor is significantly correlated with literacy skill evidenced by English mean percentage score.
5. If the score patterns reflect the historical trends, the numeracy skill of learners in terms of Mathematics mean percentage score in the year 2028 for Key Stage 1 is 82.102, KS2 is 81.952, KS3 is 77.927, and KS4 is 72.287.
6. If the score patterns reflect the historical trends, the literacy skill of learners in terms of English mean percentage score in the year 2028 for Key Stage 1 is 81.357, KS2 is 81.481, KS3 is 71.347, and KS4 is 81.467.

5.2. Recommendations

Based on the findings resulting from this exploration, the following recommendations were laid down to target people:

1. **School heads** should implement projects that focus mainly on numeracy and literacy enhancement for learners, and having a rigid monitoring and evaluation of such projects so as to ensure that every learner will have assistance on those two aspects. The following proposed projects are given below:

a. Proposed Program for Numeracy, **Project ONE (Overcoming Numeracy Enigma)** - Using manipulative tools can be a great way to help learners understand and apply abstract concepts in math. Use questions and prompts to facilitate this exploratory learning process. By encouraging exploration, discussion, and real-world applications, teachers can help learners develop their problem-solving skills and have fun while doing it. As such, it is important to consider each student's individual needs and choose manipulative tools that are best suited for their individual learning style. Thus, teachers should employ manipulatives. These tools may also help pupils visualize mathematical concepts. Manipulative tools work best when teachers know how to use them and pick the best activities for their students.

b. Proposed Program for Literacy, **Project WAVE (Word Amalgamation through Vocabulary Enhancement)** - This project is a reading project which aims to increase the reading level of learners as revealed on the Phil-Iri result. Various reading materials are used in accordance with the needs of students. Flexibility considers and takes into account various aspects that include student characteristics including intellectual, emotional and spiritual abilities as well as obstacles in learning. Teachers provide their self-made reading materials based on the needs of their learners which are well compiled and organized with monitoring tools to find out the progress of the pupils and for assessment purposes. Educational video and power point presentation are also applied during the teaching and learning process particularly in literacy. It's not just pure reading through text, there are unlocking of difficulties and context clues so that pupils are able to understand and interpret the meaning of the sentences and even paragraphs. Aside from employing the usual way of teaching and learning process where there is chalk and board, using charts, flashcards, and other learning materials, group activities, experimenting and others, teachers can also maximize the use of technology in teaching and reading remediation to support good learning in different learning areas. Once their vocabulary is expanded, their knowledge can be applied in solving problems in Math and Science as well as in other disciplines. Moreover, teachers can also use spelling activities every day before the start of their classes as part of their drill and motivation. In this way, it will help a child to develop a strong connection between the letters and their sounds. Learning high-frequency 'sight words' can assist them in both their reading and writing. Even the parents can be involved in assisting learners lagging behind in reading. They are considered as silent heroes because they gave time, effort and concern to children in schools. Indeed, this Project WAVE will assist slow and non-readers, open the door to a number of opportunities for growth and development of every learner to overcome their weaknesses, improve their skills and abilities in reading, and upgrade the literacy level and performance of the school through the assistance of internal and external stakeholders.

2. **Higher education officials** should revisit the student-teacher ratio that is now being implemented on a national level. School size cannot be manipulated, adjusted or controlled, but the aspect of student-teacher ratio can be compared from the international setting, so as the numeracy and literacy level of Philippine education would not lag behind the global standard. Conferences on teaching passion and commitment cum effective strategies for 21st century learners should be made more available especially for key stages 3 and 4,

so as to sustain learners' momentum and very satisfactory performance all throughout their basic education stage of learning. Programs focusing in quality, alongside governance, equity, resilience and well-being should be promoted so that school heads will not just focus on having outstanding OPCR rating as the end goal, but would just look at it as additional reward for providing quality education for the young minds, having the changed lives as the priority.

3. **Future researchers** can replicate this study conducted, looking possibly into other predictive patterns as like quadratic, cubic, exponential and Poisson regression models. They can also conduct connected studies verifying the prediction for five years and matching it with the actual mean percentage scores every year.

5.3. Reflection

This study provides valuable insights into the potential influences of various factors on the academic performance of the learners, with a specific focus on numeracy and literacy skills. It highlights the importance of addressing challenges through targeted interventions and policy reforms to ensure that learners will succeed. The results of the data from five consecutive years in Mathematics and English shed light on how various aspects of a school profile and educational factors can influence academic outcomes differently across different subjects. This reveals significant insights into educational practices within the educational system. Moreover, the predicted results for the next five school years both in Mathematics and in English showed promising outcomes, and to realize excellent results, changes or reforms are needed. These analyses challenge educational leaders to visualize and conceptualize prospective strategies that they could utilize to enhance learners' literacy and numeracy skills. The insightful recommendations or suggestions presented in this study will serve as a valuable reference for developing projects that are specifically aimed at reducing the negative impacts resulting from the previous global crisis. As American politician and former governor of Washington, Christine Gregoire once said, "Education is the foundation upon which we build our future", so is looking into the possible, predictive status of numeracy and literacy can guide educators into preparing for it, either making it realize or providing early solution for the challenges to come.

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