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English Language Proficiency of Science and Mathematics Teachers: A Basis for English Enhancement Program

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ABSTRACT

The study was an attempt to assess the English language proficiency of Mathematics and Science teachers. The respondents of the study were 38 Mathematics teachers and 34 Science teachers from a Higher Education Institution. The data were gathered using self-constructed test as the research instrument. Its validity and reliability using index of discrimination and Spearman Brown Prophecy Formula, respectively. As the study employed the quantitative non-experimental design, analysis and interpretation were made using frequency, percent, mean standard deviation, Pearson product-moment coefficient of correlation r. analysis of variance and t-test. Nearly 2 out 5 Mathematics and Science Teachers were master's degree holders and almost the same number were baccalaureate degree holders. Both groups of teachers were found to have average level of English language proficiency in reading and writing skills, but below average level in grammar, specifically subject-verb agreement, preposition, and vocabulary. In all these skills, the Mathematics and Science teachers have the same level of proficiency. Among the three skills, those of reading and writing were significantly higher than grammar.Teachers with higher educational attainment, longer teaching experience and have passed licensure examination were those with higher level of English language proficiency in general, and in trichotomized component of reading skills, writing skills, and grammar. As an output of the study, an English enhancement program, focused on grammar was developed which can be accessed on-line.

KEYWORDS

English profeciency; science; mathematics

INTRODUCTION

The principle which had been studied in the past claimed that language affects the competent skills of the learners by learning in their selves or with the connection of group or people (Macado, K. M., & Diano Jr., F. M, 2021). In the Philippines, almost all of the subjects are taught in English and most of the examinations in schools are written in English, even board examinations. Hence, we cannot deny the fact that English language plays an important role in our country most especially in the academe. The knowledge in grammar is basic in comprehension it is used in context. In fact, it is a strong component of all process related to reading cmprehension, grammar is also included as one of the skills to be developed in context. Sentences are taken in context, with the chosen selections used as a springboard to the lesson Surot (2004).

Teachers who teach Science and Mathematics use English as a medium of instruction in the classroom. Having observed classes in Science and Mathematics, there are some teachers

who would use both English and Filipino as a medium of instruction in the classroom. Hence, students themselves would not speak in English anymore, but would speak in Filipino. The worst case scenarion is that they speak in pure Filipino. Also, having checked the lesson plan of teachers, there are also evidences of grammatical error on the said lesson plan. It is in this premise that the researchers undertook this study. The aim of this study was to determine the English proficiency level of the teachers teaching Mathematics and English, if so, which aspects of the English language cause them particular difficulty. Those grammar items identified as problematic would be included in a professional development program specifically devised for teachers at that centre.

The main purpose of this study was to present a Development Program, through an English Enhancement Program for teachers of Science, and Mathematics to help improve their English language communication skills.

Specifically, this study sought to answer the following questions:

1. What are the educational attributes of the respondents in terms of the following?
   1.1 Educational background
   1.2 Length of experience in education
   1.3 Government Eligibility
2. What is the proficiency level of the respondents in English on the following areas?
   2.1 Reading Skills
   2.2 Writing Skills
   2.3 Grammar
3. Is there a signficant difference among the levels of proficiency in English of the respondents on the following?
   3.1 Reading Skills
   3.2 Writing Skills
   3.3 Grammar
4. Is there a significant correlation between the educational attributes of the respondents and the level of English language proficiency in each of the following:
   4.1 Reading skills
   4.2 Writing skills
   4.3 Grammar
5. Is there significant correlation between grammar and
   5.1 Reading skills
   5.2 Writing skills
6. Is there a significant difference between the English Proficiency level of Mathematics and Science Teachers?
7. What English enhancement development program may be developed as a result of the study?

Conceptual Framework

The study of Van Canh and Renandya (2017) clearly supports the idea that teachers need to have good level of English language in order to deliver the lesson effectively. Special focus on the teaching of Mathematics and Science was the concern in the study of Yahaya et.al. (2017). The present study was conceptualized and guided by the results of the aforementioned studies. The conceptual model is presented below.

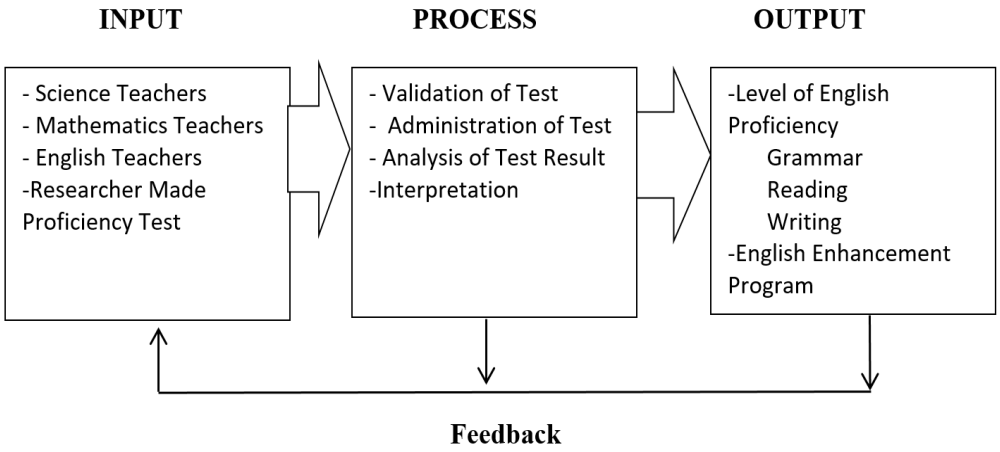

Figure 1. Research Paradigm

Figure 1 presents the framework of the study. The results of the proficiency test will be correlated and the weaknesses of the respondents will provide the data for planning and designing a development program.

The output of the study were considered in terms of the constructed research instrument and the respondent teachers.

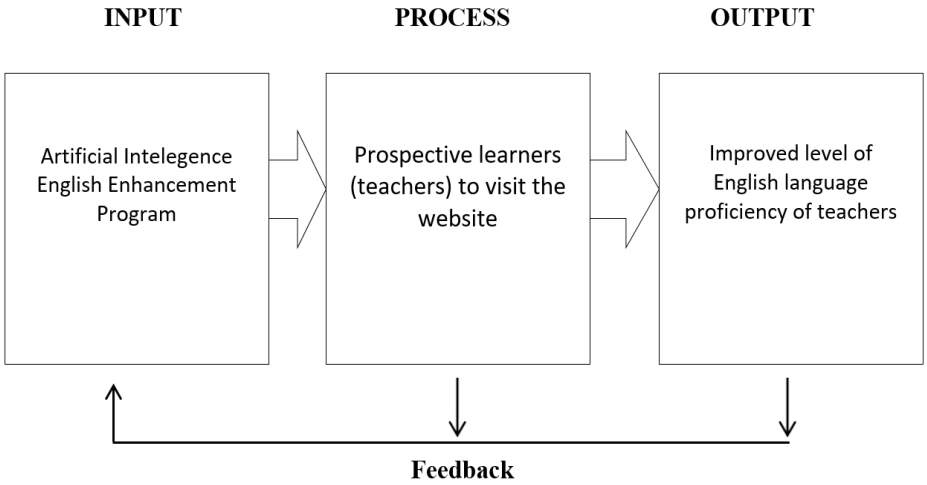

Figure 2. Operational Framework

Figure 2 presents the framework of the study. Teachers will log in at the Artificial Intelligence English Enhancement Program for Teachers, there will be an online lecture and exercises that will help improve the English language proficiency of the teachers.

The learner is expected to learn throough the online program on subject – verb agreement and vocabulary. After the lecture, the learner is supposed to answer exercises. There are 150 items on subject – verb agreement and 110 items on vacabulary. The learner is considered as having learned the lesson if he/she has obtained two – thirds or 67.0% of the total test item on each area.

RESEARCH METHODS

This research utilized the descriptive type of research in developing an English Enhancement Program (EEP) for teachers who are teaching Science and Mathematics. This was used because according to Calderon and Gonzales (2010), descriptive research describes and involves the description, recording, analysis and interpretation of the present nature

composition or process of phenomena. It also describes the present and prevailing situations, their analysis and their causes and effects. In this study, the EEP will be described based from the result of the English Proficiency Test. Thus, a descriptive study may result in a proposed program or in the development of instruments used.

Participants

The Teachers of Science and Mathematics who are teaching in selected higher education institution were chosen as the respondents of the study. There are thirty eight Mathematics and thirty four Science teacher respondents. A total of seventy two teacher respondents comprised this study.

Research Instrument

The researcher constructed a 66 – item multiple choice test using the split-half design. The items covered reading and writing skills, and grammar on subject-verb agreement, prepositions and vocabulary. The areas of grammar were based on previous studies which reveal these areas where difficulty was experienced. It underwent validation and reliabity test.

RESULTS AND DISCUSSION

1. Among the Mathematics teachers, 42.1% have earned only baccalaureate degree while 39.5% have finished their master's degree. Among the Science teachers, 44.1% and 35.3% have finished their baccalaureate and master's degree, respectively. With the longest teaching experience of at most 11 years, the average length of teaching experience were 8.2 years and 11.9 years for mathematics and science teachers, respectively. The length of teaching experience of the science teachers are spread over a wider range than those of the mathematics teachers as depicted by the standard deviations. Those who have passed either the Licensure Examination for Teachers comprise 65.8% of the mathematics teachers 61.8% of the science teachers. Presumably the rest have not yet passed any government examination.
2. The scores obtained by the mathematics teachers in the English Proficiency Test yielded mean scores of 6.74 (56.2 %) and 7.37 (61.4 %) on Reading and Writing Skills, respectively. The mean scores of the Science these two areas are 6.94 (57.8 %) and 6.9 (57.5 %) yielding the overall result of 6.83 (56.9 %) and 7.13 (59.4 %) for the two groups of respondents.
3. The analysis of variance indicated the existence of significant difference in the proficiency levels of the two groups of teachers in the reading and writing skills and the three areas in grammar. The t-test identified the areas which significantly differ. The t-values that exceed the critical values are those between reading skills and subject-verb agreement, between writing skills and subject-verb agreement, and between writing skills and vocabulary.
4. The highest educational attainment, length of teaching experience and government examinations passed significantly correlate with the level of English language proficiency at 5% level of significance for both group of respondents. This assertion is supported by the computed values of ***r*** which exceed the critical values.
5. Based on the computed values of r, grammar was moderately but significantly correlated with the reading and writing skills of both the math and science teachers. Thus, grammar tends to help in reading and writing on the other hand, reading and writing skills may also enhance knowledge in grammar.

6. The t-test was used to determine the significant difference that exists between the English language proficiency levels of the mathematics and science teachers using the means in terms of percent, it was found that the t-values in all the five areas of proficiency do not exceed the critical values at 5 % level of significance. The results point to the differences which are not statistically significant.

CONCLUSION

The findings of the study served as basis for the following conclusions:

1. The respondent Mathematics and Science teachers are predominantly baccalaureate degree holders while master degree holders are lesser in number. The Science teachers have longer experience of teaching of nearly 12 years than the Mathematics teachers who have served for an average of 8 years.
2. The Mathematics and Science teachers have average level of English language proficiency in reading and writing skills. But they have below average level of proficiency on subject-verb agreement, prepositions and vocabulary.
3. The levels of reading and writing skills of the teachers are the same, but these are significantly higher than skills on subject-verb agreement. The levels of proficiency on subject-verb agreement, prepositions, and vocabulary are equally low.
4. Higher educational attainment, longer teaching experience and being licensed teachers are contributory to the teachers' level of English language proficiency for both the Mathematics and Science groups. Moreover, These attributes specifically bring about relatively higher level of proficiency in their reading skills, writing skills, and grammar.
5. The proficiency in grammar, though relatively lower, moderately contributes to the proficiency in reading and writing skills for both the mathematics and science teachers.
6. The levels of English language proficiency of Mathematics and Science teachers are the same in all the areas of proficiency.
7. An English Enhancement Development Program is proposed

Recommendation

Based from the data gathered and conclusions drawn, the following are hereby recommended:

1. Teachers are encouraged to pursue advanced studies and to be licensed for them to be the best qualified particularly for teaching in the tertiary level.
2. Teachers are encouraged to undergo training particularly on English language communication skills.
3. While English language proficiency is a factor in effective teaching of subject areas where the medium of instruction is English, students should likewise be honed on English language proficiency.
4. Future research on the level of English language proficiency of teachersand students of subjects taught in English.

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