
Mathematics Teachers' Teaching Efficacy, Irrational Beliefs, and Students' Academic Achievement

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ABSTRACT

This study was conducted to determine the Mathematics teachers' teaching efficacy and irrational beliefs and their relationships to the academic achievement of students in all public secondary schools of Quality Learning Circle 1 in the province of Zamboanga del Sur during the School Year 2018-2019. It utilized the descriptive correlational research design with the questionnaire-checklist as data gathering instrument and the descriptive and inferential statistics as data analysis tools.

The results of the study disclosed that greater majority of the teacher-participants had a medium sense of teaching efficacy and high irrational beliefs. Majority of the student-participants had demonstrated progress in attaining mastery of basic competencies in Mathematics. There was no significant relationship between the teacher-participants' teaching efficacy and the student-participants' academic achievement. Furthermore, an insignificant relationship existed between the teacher-participants' irrational beliefs and the student-participants' academic achievement.

This study recommends that the school administrators regularly send their teachers to trainings and seminar-workshops to enhance their teaching efficacy level as well as conduct consultation and counseling activities to effectively help teachers deal with their irrational beliefs. Students should exert more effort in studying their lessons in order to reach the desired mastery level.

KEYWORDS: *teaching efficacy, irrational beliefs, academic achievement, Philippines*

INTRODUCTION

Teacher burnout, low teacher self-efficacy and irrational thoughts are experienced by the majority of the teachers in the teaching professional. According to the Social Cognitive Theory, efficacy reflects a person's beliefs in his or her ability to exercise control over. His or her level of functioning and over events affecting his/her life. The more strongly a teacher holds irrational beliefs, the less effective he or she may be in implementing effective treatment in the classroom. Irrational beliefs also play a significant role in the consultative process among teachers. The potential effects that the teaching efficacy and irrational beliefs of teachers have on the academic achievement of students could not be undermined.

Furthermore, the urgency to address the problems on the low teaching efficacy and irrational beliefs of teachers had encourage the researchers to undertake a study in order to gain valuable insights that would serve as practical guide to school administrators and other

school's stakeholders in planning and implementing various developmental programs and activities which are aimed at not only reducing the irrational beliefs but also, more importantly, enhancing the teaching efficacy of teachers and the students' academic achievement.

Statement of the Problem

This quantitative-correlational study was conducted to assess the teaching efficacy and irrational beliefs of Mathematics teachers and the academic achievement of students in all public secondary schools of Quality Learning Circle I (QuaLCi I) in the province of Zamboanga del Sur for School Year 2018-2019. Specifically, it endeavored to determine the teaching efficacy level of the Mathematics teacher-participants in terms of Mathematics teaching outcome expectancy; and personal mathematics teaching efficacy; the level of irrational beliefs in terms of self-downing attitudes, low frustration tolerance attitudes, attitude toward school organization and authoritarian attitudes toward students; the academic achievement of the student-participants based on their first and second grading mean percentage scores in Mathematics; significant relationship between the Mathematics teacher-participants' teaching efficacy and the student-participants' academic achievement; and significant relationship between the Mathematics teacher-participants' irrational beliefs and the student-participants' academic achievement.

METHODOLOGY

The quantitative-correlational research design was used with the questionnaire-checklist as the data-gathering tool. The participants involved in the study were 63 Grades 7, 8, 9 and 10 Mathematics teachers from the public secondary schools of Dumingag, Mahayag, and Josefina, Zamboanga del Sur during the School Year 2018-2019. Frequency and percentage distribution were used to describe the quantitative data of the study. Tests of inference were done using the chi-square tool.

RESULTS AND DISCUSSIONS

Teaching Efficacy Level of the Teacher-Participants

Table 1 presents the data which reflect the teaching efficacy level of the Mathematics teacher-participants. The results show that out of the 63 teacher-participants, 53 or 84.13 percent have obtained raw scores which range from 43-75 which have the corresponding description of "medium efficacy"; eight or 12.70 percent have garnered raw scores which range from 76-105, having the corresponding description of "high efficacy"; and only two or 3.17 percent have yielded raw scores which range from 21-42, described as "low efficacy."

Analysis of the foregoing findings clearly reveal that greater majority of the teacher-participants possess a medium sense of teaching efficacy in Mathematics. The findings further indicate that the teacher-participants generally perceived that they have the adequate competence to effectively teach Mathematics concepts and skills to their students. They also tend to exert effort in planning and preparing their daily lessons and class routines as well as in providing classroom-based tasks and activities that could help their students to learn Mathematics easily. Furthermore, the given findings are supported from one of the claims of Bates, Kim, and Latham [1] that teachers who have an adequate sense of Mathematics

teaching self-efficacy are likely to try different strategies when teaching, reflect on their teaching when students don't learn, and are confident in their ability to teach Mathematics.

Table 1. *Teaching Efficacy Level of the Teacher-Participants*

Range	Descriptions	Frequency	Percentage
76 – 105	High Efficacy	8	12.70
43 – 75	Medium Efficacy	53	84.13
21 – 42	Low Efficacy	2	3.17
Total		63	100.00

Irrational Beliefs Level of the Teacher-Participants

Table 2 displays the data which reflect the level of the irrational beliefs of the teacher-participants as to self-downing attitudes, low frustration tolerance attitudes, and authoritarian attitudes toward students.

Based on the table shown, the results reveal that among the 63 teacher-participants involved, 40 or 63.49 percent of them have yielded raw scores which range from 74-110 which have the corresponding description of “high”; and 23 or 36.51 percent of the same group have earned raw scores which range from 37-73, having the corresponding description of “medium.”

Analysis of the preceding findings evidently indicate that majority of the teacher-participants possess a high level of irrational beliefs. According to Ellis [2], having high irrational beliefs, the teacher-participants hold negative outlook about their school as an organization and its members as well as demonstrate controlling attitudes toward their students. Furthermore, the given findings support another claim of Bernard [3] that teachers with high irrational beliefs tend to make rigid demands of themselves for achievement and approval as well as take personally lack of accomplishment and criticism.

Table 2. *Irrational Beliefs Level of the Teacher-Participants*

Range	Descriptions	Frequency	Percentage
74 – 110	High	40	63.49
37 – 73	Medium	23	36.51
22 – 36	Low	-	-
Total		63	100.00

Academic Achievement of the Student-Participants

Table 3 vividly displays the data which reflect the academic achievement of the student-participants based on their Mean Percentage Scores (MPS) during the first and second grading examinations in their Mathematics subject.

Based on the table presented, the results disclose that 46 or 73.02 percent of the classes have obtained MPS of 66-85, described as “Moving Towards Mastery”; 17 or 26.98 percent, 35-65, “Average,” and no class has earned MPS which can be described as “Mastery,” “Closely Approximating Mastery,” “Low,” “Very Low,” and “Absolutely No Mastery.”

Analysis of the foregoing findings clearly elucidate that majority of the student-participants have an academic achievement which is at the “Moving towards mastery” level. The findings also reveal that the students have shown progress in attaining mastery of the basic competencies in Mathematics. Furthermore, the given findings strongly support one of the claims of Armstrong [4] that teachers’ teaching efficacy is found to be a strong source for forecasting Mathematics learning and achievement.

Table 3. *Academic Achievement of the Student-Participants*

Mastery	Achievement Level	Frequency	Percentage
Mastered	(96-100%)	-	-
Closely Approximating mastery	(86-95%)	-	-
Moving Towards Mastery	(66-85%)	46	73.02
Average	35-65%)	17	26.98
Low	(15-34%)	-	-

Table 4. *Tests for Significance of the Relationship Between the Teacher-Participants’ Teaching Efficacy and the Student-Participants’ Academic Achievement*

Variables	Chi-Square Value	Critical Value	Decision
Teaching Efficacy and Students Academic Achievement	0.02	3.84	Do not Reject Ho.

The computed chi-square value of 0.02 is less than the critical value of 3.84 with one degree of freedom at the 0.05 level of significance. Therefore, there is a sufficient proof to accept the null hypothesis.

The foregoing result indicates that there is no close association between the teaching efficacy of the teacher-participants and the academic achievement of the student-participants. The result further suggests that the teaching efficacy of the teacher-participants does not significantly affect the academic achievement of the student-participants. Although the previous numerical results on teaching efficacy clearly indicate that the teacher-participants generally hold a medium or moderate sense of teaching efficacy, it can be accurately inferred

that the teacher-participants' level of perceived competence or general ability to teach Mathematics is not that sufficient to improve the academic achievement of the student-participants or enhance the student-participants' mastery of the basic competencies in the Mathematics subject. Furthermore, the given result does not support one of the claims of Tschannen Moran and Woolfolk Hoy [5] that teachers' teaching efficacy beliefs develop the students' mathematical verbal learning skills and Mathematics achievement from elementary to secondary and tertiary levels.

Table 5. *Tests for Significance of the Relationship Between the Teacher-Participants' Irrational Beliefs and the Student-Participants' Academic Achievement*

Variables	Chi-Square Value	Critical Value	Decision
Irrational Beliefs and Students Academic Achievement	0.22	3.84	Do not Reject Ho.

As evidently shown, the computed chi-square value of 0.22 is less than the critical value of 3.84 with one degree of freedom at the 0.05 level of significance. Thus, there is an enough evidence to accept the null hypothesis.

The preceding result clearly implies that there is no direct association between the irrational beliefs of the teacher-participants and the academic achievement of the student-participants. The result also indicates that the irrational beliefs that are held by the teacher-participants do not substantially affect the academic achievement of the student-participants in Mathematics. Furthermore, the given result does not strongly support one of the claims of Terjesen and Kurasaki [6] that the irrational beliefs have become one of the potential mediators between teacher stress and efficacy.

CONCLUSIONS AND RECOMMENDATIONS

In the light of the findings derived from the study, the following conclusions are hereby drawn: 1) The teacher-participants have adequate self-perceived ability to teach Mathematics effectively; 2) The teacher-participants highly manifest rigid, inconsistent, and unrealistic beliefs toward themselves, students, school organizations, and work; 3) The student-participants have demonstrated progress in attaining proficiency of the basic competencies in Mathematics; 4) The teacher-participants' teaching efficacy is not closely associated with the student-participants' academic achievement; and 5) The teacher-participants' irrational beliefs are not closely linked with the student-participants' academic achievement.

Based on the findings of this study, the following recommendations are hereby formulated: 1) That the school administrators regularly send their teachers to trainings and seminar-workshops to enhance their teaching efficacy level as well as conduct consultation and counseling activities to effectively help teachers deal with their irrational beliefs; 2) That the teacher-participants actively participate in the trainings and seminar-workshops, as well as in consultation and counseling activities to improve their teaching efficacy and reduce their irrational beliefs; 3) That the student-participants exert more effort in studying their lessons

in order to reach the desired mastery level; and 4) That a similar study be conducted in other clusters and to include the identification of factors affecting teaching efficacy and irrational beliefs.

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