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EFFECT OF CRITICAL THINKING INFUSION ON STUDENTS PERFORMANCE IN ENGLISH: IMPLICATIONS TO ENHANCE TEACHING-LEARNING INSTRUCTIONS

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ABSTRACT

English is an academic discipline taught in primary, secondary and post-secondary education in English-speaking countries. This study aimed to determine the effect of infusion of critical thinking into English lessons and impact on students' performance in written output of selected Grade 8 students of Sta. Maria High School, Sta. Maria, Macabebe, Pampanga, during the first quarter of S.Y. 2019- 2020. A quasi-experimental, non-equivalent control group design was utilized. The following conclusions were drawn from the findings presented: (1) The gender of respondents in experimental and control groups did not affect their performance in English while both male and female respondents in the experimental group enhanced their critical thinking ability to improve their performance in English. The academic performance of the respondents during the first semester showed that the two groups are similar. Majority of the respondents from the experimental group and from the control group got an average grade of satisfactory rating. The level of critical thinking skills of the respondents from experimental and control groups need to develop. Most of the respondents belong to beginner thinker in five sections of critical thinking; (2) The infusion of critical thinking in teaching English helped the students to think critically, to comprehend, to have a deeper understanding of English concepts, and to perform well in English examinations; (3) There was a significant difference between the infusion of critical thinking and impact on students' performance in English lessons; (4) There is no significant difference between the gender of the respondents and

their performance in English after the infusion of critical thinking; and (5) The infusion of critical thinking was an effective means of enhancing students' performance, and prepares the students to solve problems in daily living and decision making.

Keywords: Critical Thinking Infusion; Students' Performance; English.

INTRODUCTION

English is an academic discipline taught in primary, secondary and post-secondary education in English-speaking countries. It includes the study of literature, compositions, language arts and sociolinguistics. This process involves critical thinking because it would enable one to take reliable and valid decisions, act ethically, and be able to adapt to changes in any given environment.

According to Chuwuyenum (2013), critical thinking is a complex concept that involves cognitive skills and affective dispositions, and this has affected the way some teachers impart the concept to the students. It also appears that some teachers find it difficult to infuse the concept into their teaching so that students can learn not only what to think but also how to think critically, therefore, students find it difficult to comprehend the concept and perform below average in English test and examinations.

Critical thinking includes five sections of skills these are inference, analyzing arguments, assumptions, deduction and interpretations.

Critical thinking is the intellectual discipline process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action. In its exemplary form, it is based on universal intellectual values that transcend subject matter divisions: clarity, accuracy, precision, consistency, relevance, sound evidence, good reasons, depth, breadth, and fairness.

Moreover, Chuwuyenum (2013) stated that critical thinking teaching strategies are active processes in promoting and enhancing students' performance in schools. Listening to lectures in the classroom, to most students is a passive activity because students do not have the opportunity to ask questions when the lecture takes place, and this makes the class dull. The intellectual skills of critical thinking-analysis, synthesis, reflection, etc.-must be learned by performing them. The following critical thinking strategies and classroom techniques are suggested: teaching instruction, simulation, term papers, homework, and examinations. Therefore, the teacher should emphasize students' active intellectual in teaching English.

Based on Valdez (2016), English education has long been recognized as a major factor in development, prompting nations to emphasize this in their national agenda. An alarming observation of Filipino students reveals that they excel in knowledge acquisition but fare considerably low in lessons requiring higher order thinking skills. The low understanding level accompanied by discouraging achievements of the students in English has become a cause of great concern of our country and has bothered badly the educators.

English, as an important subject in modern society is useful in schools, workplaces, businesses and for personal decision-making. English is seen to be a language for everyday use whether in the market place, school or even at home. Despite the important role of English in the society some students lack interest in the subject and perform poorly in it.

The reason for the continued poor performance of students in English could be attributed to the students' inability to think critically and analyze English lessons systematically.

Due to this fact, this study aimed to determine the effect of infusion of critical thinking into English lessons and impact on students' performance in written output of selected Grade 8 students of Sta. Maria High School, Sta. Maria, Macabebe, Pampanga, where the researcher practice teaching profession for almost 7 years.

METHOD OF RESEARCH

A quasi-experimental, non-equivalent control group design was utilized. The design included both pre-test and post-test data gathering on two samples to making it an independent sample design. The experimental group infuses critical thinking while traditional method for control group. Before the infusion of critical thinking a pre-test was conducted for both groups with the same test. The pre-test served as a base line data. After the infusion of critical thinking the post-test was conducted to both experimental and control groups with the same instrument used during the pre-test. The results of the post-test served as the end line of the data.

The critical thinking into content instruction stood in sharp contrast to the use of stand-alone courses as the primary vehicle for introducing students to critical thinking skills and giving them practice in using them. It is typically, the approach adopted when wide ranging thinking objectives were set across-the-curriculum.

According to Bellanca (2014), to infuse is defined as to "instill or to integrate into". The students integrate new data on prior knowledge into an idea that they already hold. The "integration" of new and old knowledge changes or expands the original idea. The new ideas were ***infused*** into the prior understanding.

Additionally, critical thinking approach, the teachers infuse in different ways. In contrast to those who rely on the passive "rub off" effect which relies only on the curriculum content being more rigorous, all infusers do spotlight the critical thinking students were expected to apply to their learning of the content.

The approach called Thinking-Based Learning involved teachers designing lessons where the thinking skills and the curriculum content were taught simultaneously. The students were introduced explicitly to strategies for more skillful thinking, and then prompted to use these strategies to think about the content they are learning. By putting an emphasis on higher-order thinking into content instruction, deeper understanding is reported, and more students engaged interest in what they are learning. When infusion was accompanied with the introduction of explicit thinking strategies, together with highly scaffold guidance by the teacher, and prompted reflective metacognition and strategic planning by the students about how they will engage in the same sort of thinking skill (preparation for transfer), a very powerful learning environment for teaching thinking was created.

RESULTS AND DISCUSSIONS

Table 1
Percentage Distribution of Respondents in terms of Gender

Gender	Experimental group		Control group			
	n	%	n	%	Total	Percentage
Male	20	29.41	23	33.82	43	63.23
Female	15	22.06	10	14.71	25	36.77
Total	35	51.47	33	48.53	68	100

Table 1 shows the percentage distribution of experimental group and control group in terms of gender. A total of 68 respondents in the study 43 or 63.23% were male respondents and 25 or 36.77% were female respondents. The experimental group with 35 or 51.47% respondents composed of 20 or 29.41% males and 15 or 22.06% females with a total of 33 or 48.53% respondents from control group with 23 or 33.82% males and 10 or 14.71% females.

It means that majority of the respondents were male in both experimental and control group. This was confirmed by the registrar office of Sta. Maria High School, Sta. Maria, Macabebe, Pampanga that most of the Grade 8 enrollees of the school were male students.

Table 2
Academic Grade of Respondents in English during the First Quarter 2019-2020

Performance descriptors	Experimental group		Control group			
	n	%	n	%	Total	Percentage
Outstanding	2	2.94	6	8.82	8	11.76
Very satisfactory	7	10.29	8	11.76	15	22.05
Satisfactory	16	23.53	11	16.18	27	39.71
Fairly satisfactory	10	14.72	8	11.76	18	26.48
Total	35	51.48	33	48.52	68	100

Table 2 revealed that 8 or 11.76% participants got an outstanding performance, 2 or 2.94% of them were from experimental group and 6 or 8.82% of them were from control group. Fifteen or 22.05% of the respondents acquired very satisfactory rating in their academic performance, 7 or 10.29 of them were from experimental group while 8 or 11.76% were from control group, 27 or 39.71 respondents got satisfactory rating, 16 or 23.53% were from experimental group and 11 or 16.18% of them were from control group, and the remaining 18 or 26.48% respondents reached fairly satisfactory rating, 10 or 14.72% were from experimental group and 8 or 11.76% were from control group.

The respondents with outstanding rating got an average grades from 90-100 passing grade, respondents reached very satisfactory rating got an average grades from 85-89 passing grade, respondents with an average

from 80-84 reached satisfactory rating, while respondents with an average grade from 75-79 belong to satisfactory rating.

The grades of the respondents were computed using revised grading system under K-to-12 curriculum, Dep. Ed order no. 8, s 2015. The scores were collected in raw score form, the total percentage scores (PS) and the weighted scores (WS) was generated in all the components: written output 25%, performance tasks 50% and quarterly assessments 25%. After quarterly assessment and after recording all summative tests, the summation of all weighted scores (WS) was the initial grade and transmuted to corresponding descriptors: outstanding, very satisfactory, satisfactory, fairly satisfactory, and did not meet the expectations.

The data shows that during the first quarter most of the respondents reached an average passing grade from 85-89 with a very satisfactory rating. The average grade of experimental group was 82.89 while the average grade of control group was 83.30 and the difference between the averages of the two groups was only 0.42 it means that two groups were comparable in terms of their academic performance during the first quarter. The average grades of both groups also showed that both groups need to improved their academic performances in English.

This was supported by Valdez (2016) that teachers found the relatedness of students' performance in English despite of low performance in the subject. Therefore, an intervention program must be implemented to address the unique needs of pupils to ensure greater proficiency in English.

Table 3
Percentage Distribution of the Respondents According to the Level of Critical Thinking in Inferences

Level of critical thinking	Inferences					
	Experimental group		Control group			
	n	%	n	%	Total	Percentage
Level 3	0	0.00	0	0.00	0	0.00
Level 2	20	29.41	10	14.70	30	44.11
Level 1	15	22.06	23	33.82	38	55.89
Total	35	51.47	33	48.53	68	100

Respondents with level 1 in inference can identify the facts in problem, less appropriate in revealing prerequisite (concept/theorem/data), and solve problems based on the concept-theorem which is not appropriate.

Respondents with level 2 in inference can identify the facts in problem, revealing the prerequisite knowledge appropriately, can solve the problem but still less accurate in every stage implemented.

The result shows that the inference level the respondents fell under level 1 and level 2 only, no one can reached level 3. It means that inference level of both experimental and control groups were not fully develop they were less clear in identifying the facts in issue, it also seen the low ability of students to formulate the basic problem with the information known to the problem and not been able to draw conclusion from observed or supposed facts.

The data supported by Farhad GhorbanDordiNejada & Heydarib (2012) showed that there was a close relationship between reading comprehension and critical thinking skills in inference. The reading and thinking and especially critical thinking were interconnected, and they were dependent on each other closely. Making inference, getting the main idea and reaching to the conclusions based on details, assumptions, arguments and premises are common to both reading comprehension and critical thinking processes.

Table 4
Percentage Distribution of the Respondents According to the Level of Critical Thinking in Assumptions

Level of critical thinking	Assumptions					
	Experimental Group		Control group			
	n	%	n	%	Total	Percentage
Level 3	1	1.47	2	2.94	3	4.41
Level 2	23	33.82	20	29.41	43	63.23
Level 1	11	16.18	11	16.18	22	32.36
Total	35	51.47	33	48.53	68	100

Respondents with level 1 in assumptions can identify the facts in problem, less appropriate in revealing prerequisite (concept/theorem/data), and solve problems based on the concept-theorem which is not appropriate.

Respondents with level 2 in assumptions can identify the facts in problem, revealing the prerequisite knowledge appropriately, can solve the problem but still less accurate in every stage implemented.

Respondents with level 3 in assumptions can identify the facts provided clearly, able to mention the concept/theorem prerequisite material, able to plan and carry out planning accurately and properly.

The result shows that majority of the respondents fell under level 2 in assumption out of 68 respondents only 3 respondents reached level 3, 1 from experimental group and 2 from control group. It means that majority of the respondents need to develop their critical thinking skills in assumptions it also shown that most of the respondents vague and lacking in evaluating logical arguments used in examining the given facts and not prepared in judging the credibility or value an assessment, methods for given purpose in relation to rules, principles and procedures.

This was agreed by Visande (2014) the development of critical thinking skills was important, there was a significant relation between critical thinking and mental activities of student that entailed the domains of the NCBTS that has a big influence on the critical thinking skills of students

Table 5
Percentage Distribution of the Respondents According To The Level of Critical Thinking in Deductions

Level of critical thinking	Deductions					
	Experimental group		Control group			
	n	%	n	%	Total	Percentage
Level 3	0	0.00	2	2.94	2	2.94
Level 2	31	45.59	23	33.82	54	54.41
Level 1	4	5.88	8	11.76	12	17.64
Total	35	51.47	33	48.52	68	100

Respondents with level 1 in deductions can identify the facts in problem, less appropriate in revealing prerequisite (concept/theorem/data), and solve problem based on the concept-theorem which is not appropriate.

Respondents with level 2 in deductions can identify the facts in problem, revealing the prerequisite knowledge appropriately, can solve the problem but still less accurate in every stage implemented.

Respondents with level 3 in deductions can identify the facts provided clearly, able to mention the concept/theorem prerequisite material, able to plan and carry out planning accurately and properly.

The results show that 4 respondents from experimental group and 8 respondents from control group reached level 1, most of the respondents fell under level 2 in deductions, out of 68 respondents only 2 respondents from control group reached level 3. It means that most of them can identify the fact or known the needed facts in making decisions, precise and clear in expressing the prerequisite knowledge, capable in making plans, and can solve the problem but not able to distinguish between conclusions based on valid logic. It also seen that many of the respondents need to enhance their critical thinking skills in deductions so that they can justify the reasons in terms of the given facts used in arriving conclusions.

This was supported by Tsai, Chen, Chang, & Chang (2013) that enhancing the critical thinking among students helped the students better understand the scientific process as well as encouraging students to become more experimental and questioning of the different aspects of the Sciences.

Table 6
Percentage Distribution of the Respondents According To The Level of Critical Thinking in Interpreting Information

Level of critical thinking	Interpreting information					
	Experimental group		Control group			
	n	%	n	%	Total	Percentage
Level 3	3	4.41	5	7.35	8	11.76
Level 2	29	42.65	19	27.94	48	70.59
Level 1	3	4.41	9	13.24	12	17.65
Total	35	51.47	33	48.53	68	100

Respondents with level 1 in interpreting information can identify the facts in problem, less appropriate in revealing prerequisite (concept/theorem/data), and solve problems based on the concept-theorem which is not appropriate.

Respondents with level 2 in interpreting information can identify the facts in problem, revealing the prerequisite knowledge appropriately, can solve the problem but still less accurate in every stage implemented.

Respondents with level 3 in interpreting information can identify the facts provided clearly, able to mention the concept/theorem prerequisite material, able to plan and carry out planning accurately and properly.

The result shows that 8 of respondents reached level 3 of interpreting information 3 from experimental group and 5 from control group, in this level, respondents can identify clearly the fact in the given problem, it can be seen also their ability to plan in solving problem based on the facts given, prerequisite knowledge, clear procedures and can provide a logical reason, but the few numbers of respondents reached level 3 was not enough to conclude that respondents had a high level in interpreting information, since majority of the respondents fell under level 2, this means that still a need to push the critical thinking in interpreting information towards higher order thinking skills.

This was agreed by Ramos, Dolipas, & Villamor (2013) push teachers toward higher-order thinking skills in the classroom. Instruction in thinking skills promotes intellectual growth and fosters academic achievement gains. It can be noted from the results that the higher the level of HOTS of students, the better their performance.

Table 7
Percentage Distribution of the Respondents According To the Level of Critical Thinking in Analysing Arguments

Level of critical thinking	Analysing arguments					
	Experimental group		Control group			
	n	%	n	%	Total	Percentage
Level 3	3	4.41	0	0.00	3	4.41
Level 2	29	42.65	25	36.76	54	79.41
Level 1	3	4.41	8	11.76	11	16.17
Total	35	51.47	33	48.52	68	100

Respondents with level 1 in analysing arguments can identify the facts in problem, less appropriate in revealing prerequisite (concept/theorem/data), and solve problems based on the concept-theorem which is not appropriate.

Respondents with level 2 in analysing arguments can identify the facts in problem, revealing the prerequisite knowledge appropriately, can solve the problem but still less accurate in every stage implemented.

Respondents with level 3 in analysing arguments can identify the facts provided clearly, able to mention the concept/theorem prerequisite material, able to plan and carry out planning accurately and properly.

The results show that 11 respondents fell under level 1, many of the respondents fell under level 2 in analysing arguments. Only 3 respondents from experimental group reached level 3 in this section of critical thinking. It means that many of the respondents can examine and clearly established analysing problem but they missed the argumentation. It also shows the numerous numbers of respondents fell under level 1 and level 2 in analysing arguments. This means that many of the respondents need to improve their skills in analysing arguments so that they can identify examining ideas, argument and able to distinguish conclusion with logical consideration.

This was supported by Visande (2014) the development of critical thinking skills and mental activities of student that entailed the domains of the NCBTS that has a big influence on the critical thinking skills of students and the skills and knowledge acquired by students.

Table 8
Pre-test and Post-test Results on Students' Performance in English

Test Results	Experimental Group		Control Group	
	Pre-Test	Post-Test	Pre-Test	Post-Test
Highest scores obtained	17	46	19	40
Lowest Scores Obtained	7	19	6	16
n	35	35	33	33
Mean	12.37	35.46	12.15	28.09
PL	24.74	70.92	24.30	56.18
SD	2.70	6.81	3.18	6.40

The scores of the respondents were determined by summing up the numbers of correct items resulting in a possible score of 0-50.

The pre-test and post-test results showed that the experimental and control groups improved their scores after teaching English lessons. The mean of experimental group increased by 23.09 (pre-test mean was 12.37 and the post-test was mean 35.46), and the mean of control group increased by 15.94 (pre-test mean was 12.15, and the post-test mean was 28.09). It means that both experimental and control group gain knowledge about the lessons during the period of study. But the experimental group infused critical thinking did better in their post-test score and shown more progress in their academic performance in English.

More so, the post-test results showed that the mean difference of two groups differed 7.37 (experimental group 35.46, and control group 28.09). The mean difference in post-test English scores between the experimental and control group could be attributing to acquisitions of knowledge in critical thinking skills which were infused in English lessons. The data revealed that the mean results of experimental group improved by 7.37. It means that the experimental group infused critical thinking in English lessons gain more knowledge than control group counterpart.

This implies that teaching critical thinking was effective for students' thinking and learning development. Similarly, the infusion of critical thinking in English lessons was effective in improving students' performance. It also showed the usefulness of critical thinking skills of the students in understanding English concepts.

This was agreed in the research of Scott and Markert (2011) they found that the critical thinking skills correlated with students' academic success. They concluded that critical thinking skills are factors involved in students' success.

Table 9
Comparison of Post-test Results On Students' Performance in English between Experimental and Control Groups

Data Analysis	Experimental group	Control group
Mean	35.46	28.09
Observations	35.00	33.00
df	66.00	
t Stat	4.60	
P(T<=t) one-tail	0.00	
t Critical one-tail	1.67	

*t is significant at 0.05

The result showed that experimental group gain more knowledge about the lessons during the period of study, the experimental group infused critical thinking did better in their post-test score and shown improvement in their academic performance in English than their control group counterpart.

As displayed in the table there was a mean difference of 7.37 or 7.37% (experimental group 35.46, and control group 28.09), The mean difference in post-test English scores between the experimental and control group could be attributing to acquisitions of knowledge in critical thinking skills which were infused in English lessons and the mean difference was significant, $t(66) = 4.07$, $P=0.00$. Since the t-stat with the value (4.07) was greater than critical value (1.67) it means that there was a significant difference in the infusion of critical thinking in English lessons and written output, therefore the experimental group and control group were not comparable in terms of their performance in English after the infusion of critical thinking.

The results of the study showed that after the infusion of critical thinking the experimental group gain more knowledge, and understanding in English concepts than their control group counterpart. It also showed that infusion of critical thinking helped the students to enhance their performance in English. With this infusion of critical thinking in teaching and learning process was effective in improving students' performance.

This was supported by study of Chukwuyenum (2013) that a critical thinking skill is effective in improving students' performance. An English teacher stated:

"My students in the experimental group improved a lot. Today, they are more participative, they can analyze our lessons correctly and easily. They likely to enjoy activities that really involves critical thinking skills. Aside from it, they much more likely to participate in school activities as a whole especially when we conducted school debates, English games, etc.".

The secondary school principal observed this as she stated:

"The class that is the experimental group becomes participative and cooperative in our school activities. I can still remember when I sit in with their class, I really feel that they are not just high school learners but seems to be like college students. They speak and rationalize things aloud and confident. Most of their learners were oftentimes seen in the library, reading books and searching for articles. Their outputs are really amazing. Such a great intervention. I am planning to train my teachers in different subject areas to do the same as well".

Table 10
Gender Difference in the Performance in English after the Infusion of Critical Thinking

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	8.166667	1	8.166667	0.150888	0.717477	7.708647
Within Groups	216.4955	4	54.12387			
Total	224.6621	5				

Table 10 illustrates the result of analysis of variance to determine the difference on the performance in English of the experimental group-respondents as to gender. There is a mathematical difference among the mean-perceptions of the respondents regarding their leadership capacity and effectiveness of instructional supports. This difference when subjected to ANOVA, the computed value of 0.15 which is lower than the critical value of 7.71 set at 0.05 level of significance. Male and female learners equally perform efficiently in English in the integration of critical thinking approach in their lessons/concepts in the subject. Regardless of gender, the learners are equally improved themselves thorough continuous learning with the addition of critical thinking approach in the discussion of the concepts in English. There is enough evidence found to accept the hypothesis of the study. Therefore, there is no significant difference between the gender of the respondents and their performance in English after the infusion of critical thinking. In this study, this was determined as one teacher stated that:

"The female and male learners do not differ in their performance in English subject. Both gender love to participate in the subject area. They insist to stand up among the crowd and motivate others to do so.".

IMPLICATIONS TO THE TEACHER, EDUCATION AND RESEARCH

The result of the study implies that there is a need for teacher to infuse critical thinking in teaching English to improve students' performance. This skill may equip the students in drawing conclusion from observed or supposed facts, judging the credibility or value of assessment and methods for given purposes in relation to the rules, principles and procedures, justify the reasons in terms of the given facts used in arriving conclusions, interpreting information or clarifying meaning through categorization and translation, analysing argument or identifying and examining ideas and arguments. They may also serve as a tool used by students in daily lives to solve problems and make valid decisions.

The implication of this study to the education and research is to infuse critical thinking skills in curriculum of teacher's education to formally train teachers of English the rudiments of critical thinking skills on how to integrate into school curriculum for learning and to have a better understanding about critical thinking that would enable them to evaluate students' performance more appropriately in English.

This also implies that infusion of critical thinking in English lessons was effective in improving students' performance.

CONCLUSIONS

1. The gender of respondents in experimental and control groups did not affect their performance in English while both male and female respondents in the experimental group enhanced their critical thinking ability to improve their performance in English. The academic performance of the respondents during the first semester showed that the two groups are similar. Majority of the respondents from the experimental group and from the control group got an average grade of satisfactory rating. The level of critical thinking skills of the respondents from experimental and control groups need to develop. Most of the respondents belong to beginner thinker in five sections of critical thinking.
2. The infusion of critical thinking in teaching English helped the students to think critically, to comprehend, to have a deeper understanding of English concepts, and to perform well in English examinations.
3. There was a significant difference between the infusion of critical thinking and impact on students' performance in English lessons.
4. There is no significant difference between the gender of the respondents and their performance in English after the infusion of critical thinking.
5. The infusion of critical thinking was an effective means of enhancing students' performance, and prepares the students to solve problems in daily living and decision making.

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