

A Cross-Sectional Analysis on the Level of Critical Thinking Skills of Students in the College of Management and Technology at CEU Malolos

Josan D. Tamayo, MIT, Jay-Arr C. Tayao, MIT, Marcos Y. Lopez, Ph.D, Margarita J. Mangalile, MBA

Centro Escolar University-Malolos, College of Management and Technology, City of Malolos, Bulacan, Philippines

Abstract- This study deals with “A Cross-Sectional Analysis on the Level of Critical Thinking Skills of Students in the College of Management and Technology at CEU Malolos”. Critical thinking is one of the 21st century education skills required in the tertiary level students and a particularly with high impact of importance in the field of education. Training skills related to critical thinking is so important that some scholars called it the main objective of university education and experience. Cross-sectional analysis will be used in the study to compare the critical thinking skills among students in the College of Management and Technology of Centro Escolar University in Malolos, Bulacan, Philippines. The sample and respondents of the study includes a total of 277 students from first year to fourth year enrolled in the different academic programs under the College of Management and Technology during the Academic Year 2013-2014. In determining the level of their Critical Thinking Skills the instrumentation is the CEU-Lopez Critical Thinking Test (Lopez, 2012) that is multi-aspect general knowledge critical thinking test designed for tertiary students in the Philippines and in Asian Context. Data was analyzed in the two levels of descriptive and inferential statistics with the help of SPSS software. In descriptive level, statistic traits such as frequency, mean and standard deviation were used to describe data. In inferential level, T- test was applied.

Index Terms- critical thinking, critical thinking skills, assessment, cross-sectional analysis.

I. INTRODUCTION

College educational institutions across the world are being challenged to improve mode of instructions to their undergraduate students, a future workforce that will have the knowledge and necessary skills to meet the growing demands of modern careers in the 21st century that will contribute to the globally challenge economy. Indeed, a college education has never been more necessary for productive participation in society. Employers like Business Process Outsourcing industry now seek individuals who are able to think critically and communicate effectively in order to meet the requirements of the new knowledge economy (Hart Research Associates, 2006; Levy & Murnane, 2004) and in the growing demand of business analytics and intelligence. Therefore, the skills taught in higher education are changing; less emphasis is placed on content-specific knowledge and more is placed on critical-thinking skills,

such as: analytic and quantitative techniques and reasoning, problem solving, and written communication.

The development of critical thinking is considered to be an essential component of the general education of college students (Ash, Clayton, and Atkinson, 2005; Renaud and Murray, 2007; Schamber and Mahoney, 2006; Stupnisky, Renaud, Daniels, Haynes, and Perry, 2008; Tsui, 2002; Solon, 2007). The College of Management and Technology of Centro Escolar University in Malolos, Bulacan is a Level III Re-Accredited status by the Philippine Association of Colleges and University Commission on Accreditation, certified by FAAP. The college aims to develop and produce top caliber business leaders and IT professionals equipped with critical thinking skills, offering courses such as B.S. in Business in Administration major in Management with Service Management in BPO, Management Accounting, Marketing Management, Financial Management, and B.S. in Information Technology.

The question is whether or not these desired gains are at favorable levels. Several researchers conclude that critical thinking may not be at an acceptable level when students leave college. Even more distressing is Norris' (1985) conclusion that competence in critical thinking is lower than it should be at every stage of schooling. Also, they found that although seniors outperform freshmen at analyzing articles, they show “major deficiencies” in their performance. Moreover, Keeley (1992) found that both freshmen and seniors show “poor performance” at identifying assumptions. It seems clear that students could benefit from a curriculum that emphasizes the importance of improving critical thinking as learning institutions, educators, and students are in agreement that improvements in critical thinking is desirable. A possible answer to the problem would be to offer students specific courses to improve critical thinking skills. In fact, there is no scientific basis to support the notion that one particular course, other than a critical thinking type of course, can make any positive measurable difference to increase critical thinking (Solon, 2007). The above alternative may not be highly effective as some students will be unable to generalize the learned skills outside the classroom. A second alternative would be to promote faculty initiatives to enhance critical thinking.

Statement of the Problem

The study aims to determine the level of critical thinking skills of the students in the College of Management and Technology using Cross-Sectional Analysis. Specifically, the study aims to answer the following questions:

1. What is the level of critical thinking skills of students in the College of Management and Technology in terms of year level?
 - Freshmen;
 - Sophomores;
 - Juniors;
 - Seniors?
2. What is the level of Critical thinking Skills of the respondents in terms of:
 - Deduction;
 - Credibility;
 - Assumptions;
 - Induction;
 - Meaning/Fallacies; and
 - Critical Thinking Skills (as a whole)?
3. Do the Critical Thinking Skills per dimension have a significant effect on the result of the Critical Thinking Test per year level?

Significance of the Study

The result of this study will give important information for consideration by some educational sector as basis for improvement of Critical Thinking skills in computer programming.

To the *Learners*, this study will give them an idea on the importance of knowing critical thinking as one of the factor of student's in the tertiary level or in college education. They can improve their academic performance by improving the level of their critical thinking. This study will serve as their basis on

understanding their capacity in enrolling the courses under the College of Management and Technology

To the *Teachers*, this study will knowing the level of critical thinking skills of their students and it will help them to understand how they can improve their student's academic performance.

To the *School Administrators*, the result of the study will provide them with empirical basis in making instructional materials, modules and methods that can improve the critical thinking skills of the students. Knowing that the student's performance depends on his critical thinking skills, they will provide teachers with better directions to follow so that they can give quality education to their students.

To the *Curriculum Planner and Developer*, this study will give them an idea in formulating policies that can improve the critical thinking skills of the students enrolling the college education.

To the *Future Researchers and Text Book Writers*, the result of this study may serve as guide to other similar studies in the future. They can apply the concept and importance of critical thinking in their research study.

II. CONCEPTUAL FRAMEWORK

The Cross-Sectional Analysis on the Level of Critical Thinking Skills of Students in the College of Management Technology – CEU Malolos perceived by the conceptual framework on Figure 1. It represents the Critical Thinking Skills of the CMT-CEU Malolos Students per Year Level and the five (5) dimensions of Critical Thinking such as Deduction, Credibility, Assumption, Induction and Meaning and Fallacies.

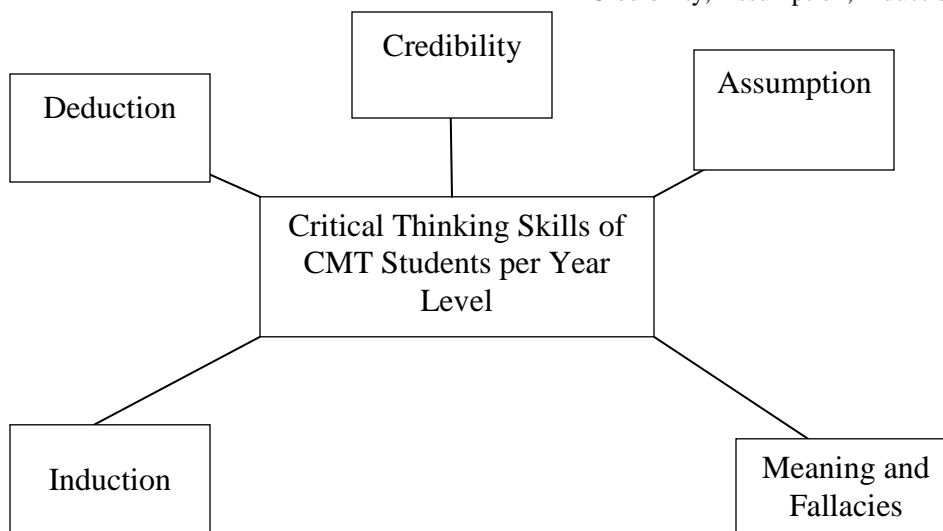


Figure 1: Conceptual Framework of the Cross-Sectional Analysis on the Level of Critical Thinking Skills of Students in the CMT - CEU Malolos

Research Methodology

Research Methodology describes the research design, the population and sample size of the respondents, the sampling technique, the description of the respondent, the research locale, the instrumentation, the data gathering procedure, and the statistical treatment of data used by the researcher.

Research Design

The purpose of the study is to determine the level of critical thinking skills of the students in the College of Management and Technology, thus the *cross-sectional analysis* is used and purposive sampling to select the respondents. This method includes giving standardized critical thinking test to determine

the profile, the scores and the level of critical thinking of the respondents.

The respondents includes a total of 274 students from first year to fourth year enrolled in the different academic programs under the College of Management and Technology during the Academic Year 2013-2014 of Centro Escolar University-Malolos. To measure the critical thinking skills of the respondents, the researcher used the CEU-Lopez Critical Thinking Test as the main data-gathering instrument in this study and using the Non-Science and University Norm of the said critical thinking test.

Mean is used to get the scores of the grades of the respondents. The level of critical thinking skills is obtained by getting the mean of their scores per dimensions of the test, the researchers then identified if there is a significant difference on the level of critical thinking skills of the respondents per year level and per dimension.

III. PRESENTATION, ANALYSIS, AND INTERPRETATION OF DATA

This portion of the study presents and analyzes the data gathered in relation to the general problem of the study. It is organized in accordance with the sequence of sub-problems as stated in the Statement of the Problem. Based from the gathered data from the survey tool interpretations were derived. In order to calculate the corresponding statistic treatment IBM SPSS Statistic Editor was utilized in the interpretation of data.

Level of critical thinking skills of CMT - CEU Malolos students in terms of year level.

Table 1 shows the result of the critical thinking skills of CMT students and it is stated in the table the calculated weighted mean of 26.5056 for Freshman students which means in the verbal description of Beginning Thinker. Sophomore students have a calculated weighted mean of 28.7869 which according to the Local Norm of the CEU-Lopez Critical Thinking Test has a verbal description as Beginning Thinker.

Table 1: *Weighted Mean for Year Level Critical Thinking Test*

Year Level	Mean	Std. Deviation	Verbal Description
Freshmen	26.5056	6.13508	Beginning Thinker
Sophomores	28.7869	6.74812	Beginning Thinker
Juniors	28.6338	6.19502	Beginning Thinker
Seniors	33.0566	7.12367	Practicing Thinker

Above table also shows that Junior students of CMT – CEU Malolos likewise can be considered as Beginning Thinker. The calculated weighted mean of 28.6338 is categorized as Beginning Thinker by the Local Norm of the CEU-Lopez Critical Thinking Test. As for the Senior students of CMT – CEU Malolos whose Critical Thinking Skills results has a calculated weighted mean of 33.0566 or a verbal description of Practicing Thinker as shown on the table.

Level of critical thinking skills of CMT students per dimension of Critical Thinking Test.

The critical thinking skills of CMT students as shown in Table 2 in terms of Deduction has a calculated weighted mean of 6.8796, Induction meanwhile has a weighted mean of 3.6314 both fall under the verbal description of Challenged Thinker. In terms of Credibility, a calculated weighted mean of 6.3029 or a verbal description of Practicing Thinker. And Assumptions and Meaning/Fallacies both fall under the verbal description of Beginning Thinker have a calculated weighted mean of 6.1460 and 5.8723 respectively. As a whole students of CMT CEU-Malolos fall under the verbal description of Beginning Thinker for the calculated weighted mean of 28.8321.

Table 2: *Weighted Mean for each Aspect of Critical Thinking Test*

Aspect of Critical Thinking	Mean	Std. Deviation	Verbal Description
Deduction	6.8796	2.36041	Challenged Thinker
Credibility	6.3029	2.55192	Practicing Thinker
Assumptions	6.1460	2.70947	Beginning Thinker
Induction	3.6314	1.94595	Challenged Thinker
Meaning/Fallacies	5.8723	2.23240	Beginning Thinker
Critical Thinking Skills (as a whole)	28.8321	6.84744	Beginning Thinker

Table 3: Summary of Aspects of Critical Thinking and Verbal Description per Year Level

[1] Aspects of Critical Thinking	[2] First Year		[3] Second Year		[4] Third Year		[5] Fourth Year	
	[6] WM	[7] VD	[8] WM	[9] VD	[10] WM	[11] VD	[12] WM	[13] VD
[14] Deduction	[15] 6.34	[16] BT	[17] 6.50	[18] BT	[19] 7.30	[20] BT	[21] 7.62	[22] BT
[23] Credibility	[24] 5.75	[25] PT	[26] 6.62	[27] PT	[28] 6.02	[29] PT	[30] 7.22	[31] PT
[32] Assumption	[33] 5.58	[34] BT	[35] 6.36	[36] BT	[37] 5.81	[38] BT	[39] 7.28	[40] PT
[41] Induction	[42] 3.52	[43] CT	[44] 3.44	[45] CT	[46] 3.50	[47] CT	[48] 4.18	[49] BT
[50] Meaning	[51] 5.29	[52] BT	[53] 5.85	[54] BT	[55] 5.97	[56] BT	[57] 6.73	[58] BT
[59] Total Score	[60] 26.50	[61] BT	[62] 28.78	[63] BT	[64] 28.63	[65] BT	[66] 33.05	[67] PT

Table 3 shows the summary of the verbal description of each year level Critical Thinking Skills.

Significant effect of the Critical Thinking Skills per dimension to the Critical Thinking Test per year level.

It can be perceived from Table 4 that Credibility dimension of the Critical Thinking Skills has the highest F value for the Freshmen while both Credibility and Assumption has zero (0) significance value to the Critical Thinking Skills of the Freshman students. Other three (3) dimensions such as Deduction with significance value of 0.183, Induction with significance value of 0.028 and Meaning/Fallacies have significance value of 0.003 to the Critical Thinking Skills of the Freshman students.

For the Sophomore students, Induction has the highest F value. Assumption and Induction both have no significance value to the Critical Thinking Skills of the Sophomore students. While the aspects of Deduction has 0.093 significance value, .011 significance value for Credibility and Meaning/Fallacies has 0.151 significance value to the Critical Thinking Skills of the Sophomore students.

Table 4: ANOVA for each Year Level Critical Thinking Skills and Dimension

FRESHMEN		Sum of Squares	df	Mean Square	F	Sig.
DEDUCTION	Between Groups	128.819	23	5.601	1.332	.183
	Within Groups	273.383	65	4.206		
	Total	402.202	88			
CREDIBILITY	Between Groups	290.746	23	12.641	3.370	.000
	Within Groups	243.816	65	3.751		
	Total	534.562	88			
ASSUMPTION	Between Groups	404.100	23	17.570	2.947	.000
	Within Groups	387.518	65	5.962		
	Total	791.618	88			
INDUCTION	Between Groups	105.281	23	4.577	1.849	.028
	Within Groups	160.899	65	2.475		
	Total	266.180	88			
MEANING	Between Groups	185.947	23	8.085	2.450	.003
	Within Groups	214.457	65	3.299		
	Total	400.404	88			
SOPHOMORE		Sum of Squares	df	Mean Square	F	Sig.
DEDUCTION	Between Groups	173.979	24	7.249	1.618	.093
	Within Groups	161.267	36	4.480		
	Total	335.246	60			
CREDIBILITY	Between Groups	266.695	24	11.112	2.331	.011
	Within Groups	171.633	36	4.768		
	Total	438.328	60			
ASSUMPTION	Between Groups	274.732	24	11.447	3.512	.000
	Within Groups	117.333	36	3.259		
	Total	392.066	60			
INDUCTION	Between Groups	230.716	24	9.613	4.104	.000
	Within Groups	84.333	36	2.343		

	Total	315.049	60			
MEANING	Between Groups	95.372	24	3.974	1.455	.151
	Within Groups	98.300	36	2.731		
	Total	193.672	60			
JUNIOR		Sum of Squares	df	Mean Square	F	Sig.
DEDUCTION	Between Groups	226.566	24	9.440	3.045	.001
	Within Groups	142.617	46	3.100		
	Total	369.183	70			
CREDIBILITY	Between Groups	184.644	24	7.693	2.279	.008
	Within Groups	155.300	46	3.376		
	Total	339.944	70			
ASSUMPTION	Between Groups	219.403	24	9.142	2.641	.002
	Within Groups	159.217	46	3.461		
	Total	378.620	70			
INDUCTION	Between Groups	144.930	24	6.039	2.650	.002
	Within Groups	104.817	46	2.279		
	Total	249.746	70			
MEANING	Between Groups	171.627	24	7.151	2.378	.006
	Within Groups	138.317	46	3.007		
	Total	309.944	70			
SENIOR		Sum of Squares	df	Mean Square	F	Sig.
DEDUCTION	Between Groups	175.369	24	7.307	1.255	.280
	Within Groups	163.083	28	5.824		
	Total	338.453	52			
CREDIBILITY	Between Groups	302.516	24	12.605	4.481	.000
	Within Groups	78.767	28	2.813		
	Total	381.283	52			
ASSUMPTION	Between Groups	219.338	24	9.139	2.217	.022
	Within Groups	115.417	28	4.122		
	Total	334.755	52			
INDUCTION	Between Groups	109.197	24	4.550	1.747	.078
	Within Groups	72.917	28	2.604		
	Total	182.113	52			
MEANING	Between Groups	263.819	24	10.992	2.513	.010
	Within Groups	122.483	28	4.374		
	Total	386.302	52			

For Junior students four (4) aspects of Critical Thinking skills have significance value to the Critical Thinking Skills. Credibility, Assumption, Induction and Meaning/Fallacies have 0.008, 0.002, 0.002 and 0.006 significance value respectively. But the Deduction aspect has no significance value to the Critical Thinking Skills of Junior students. Deduction has the highest F value for Junior students.

Lastly, for Senior students Critical Thinking Skills the highest F value is the Credibility aspect, also this aspect has no significance value. While the remaining four (4) aspects all has significance value of 0.280 for Deduction, 0.022 for Assumption, 0.078 for Induction and 0.010 for Meaning/Fallacies.

IV. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter provides a summary of the findings of the study, the conclusions based upon the obtained results, as well as the recommendations forwarded in the light of the conclusions arrived at.

Using the descriptive method of research, the study sought to investigate the Cross-Sectional Analysis on the Level of Critical Thinking Skills of Students in the College of Management and Technology at CEU Malolos.

Summary of Findings

1. The level of critical thinking skills of CMT - CEU Malolos students for Freshmen has a weighted mean of 26.5056, Sophomores has 28.7869 weighted mean, Juniors has 28.6338 weighted mean all interpreted as verbal description of

Beginning Thinker. While Seniors has the highest weighted mean of 33.0566 which is interpreted as verbal description of Practicing Thinker. It can be noted that mean escalated as the year level of the respondents increase. It can also be concluded that Senior students' four year of education exposure enhances their Critical Thinking Skills. While for Freshmen, Sophomores and Juniors although there are slight differences from their weighted mean three year levels fall under Beginning Thinker.

2. The level of Critical Thinking Skills of the students of CMT CEU-Malolos can be categorized as Challenged Thinker for the aspects of Deduction and Induction with calculated means of 6.8796 and 3.6314 respectively. Assumptions with weighted mean of 6.1460 and Meaning/Fallacies with weighted mean of 5.8723 both fall under the verbal description of Beginning Thinker. Among the five (5) aspects Credibility is the only aspect falls under the verbal description of Practicing Thinker and a weighted mean of 6.3029. The CMT CEU-Malolos students' critical thinking skills as a whole falls under the verbal description of Beginning Thinker with a weighted mean of 28.8321.
3. The Critical Thinking Skills of the Freshman students has significance value on the aspects of Deduction with significance value of 0.183, Induction with significance value of 0.028 and Meaning/Fallacies has significance value of 0.003 while Credibility and Assumption have no significance value to their Critical Thinking Skills. Sophomore students meanwhile the aspects of Deduction has 0.093 significance value, 0.011 significance value for Credibility and Meaning/Fallacies has 0.151 significance value to their Critical Thinking Skills. On the other hand Junior students' four (4) aspects of Critical Thinking skills have significance value to the Critical Thinking Skills. Credibility, Assumption, Induction and Meaning/Fallacies have 0.008, 0.002, 0.002 and 0.006 significance value respectively. But the Deduction aspect has no significance value to the Critical Thinking Skills of Junior students. For Senior students Credibility aspect has no significance value. While the remaining four (4) aspects all has significance value of 0.280 for Deduction, 0.022 for Assumption, 0.078 for Induction and 0.010 for Meaning/Fallacies.

V. CONCLUSIONS

Based on the findings of the study, the following conclusions were drawn:

1. The students of CMT CEU-Malolos under freshman, sophomore and junior levels are Beginning Thinker when it comes to their Critical Thinking Skills. According to the Local Norm of CEU-Lopez Critical Thinking Test, Beginning Thinker does critical thinking with difficulty and

uncomfortability for this is the stage that an individual just begins learning how to deliberately and consciously apply critical thinking criteria and principles in evaluating arguments and other propositions encountered. While senior level students' Critical Thinking Skills are Practicing Thinker. A practicing thinker according to the Local Norm of CEU-Lopez Critical Thinking Test, regularly and habitually recognizes that improvement in critical thinking requires constant practice in applying critical thinking criteria and principles. In this stage, one recognizes the need to adopt some regimen of practice in deducing and inducing an argument, judging credibility of sources, identifying assumptions, and judging definitions encountered.

2. As per dimension of the Critical Thinking Skills, the students of CMT CEU-Malolos diverse from Challenged Thinker for Deduction and Induction aspects, Practicing Thinker for Credibility and Beginning Thinker for Assumptions and Meaning/Fallacies. It can be noted that CMT CEU-Malolos students are good in judging two contradicting statements and choosing which is more credible.
3. Both freshmen and sophomores Deduction are Challenged Thinker while juniors and seniors are Beginning Thinker. While all year levels are Practicing Thinker in terms of Credibility. Assumption aspect for freshmen, sophomores and juniors are Beginning Thinker while seniors are considered Practicing Thinker. Induction aspects for freshmen, sophomores and juniors are Challenged Thinker and seniors are Beginning Thinker. They are all Beginning Thinker in terms of Meaning/Fallacies.

VI. RECOMMENDATIONS

Based on the findings of the study and the conclusions derived from the study, the following recommendations are hereby forwarded.

1. The study revealed that CMT CEU-Malolos students need to develop their critical thinking skills. As the said skills cover the skills which are indeed vital for the courses offered in the said department. Enhancing their critical thinking skills is being ready to think critically and communicate effectively in order to meet the requirements of the new knowledge economy when they leave the University for the Business World.
2. Educators are encouraged to put emphasis on how to develop the Critical Thinking Skills of their students. Even Credibility which has the highest score from the CMT students should be improved.
3. School Administrators, Curriculum Planner and Developer can further enhance curriculum to provide CMT students instructional materials, modules and methods that can improve critical

thinking skills of the students. Also an entrance examination can be improved by adapting the CEU-Lopez Critical Thinking Test that can be a guide for the students in choosing their courses upon enrolling the college education.

REFERENCES

BOOKS

- [1] Moon, Jennifer CRITICAL THINKING: "An exploration of Theory and Practice" pages 22-23
- [2] Ennis, Robert H. "CRITICAL THINKING" copyright © 1996 by Prentice-Hall, Inc. Simon and Schuster/ A Viacom company upper saddle River, New Jersey. Pages 4-9
- [3] Rugierro, Vincent Ryan "The Art of Critical Thinking: A guide to critical and creative thought" fourth edition copyright © 1995 by Haper Collins Publisher. Pages 1-12
- [4] Chaffee, John THINKING CRITICALLY: A CONCISE GUIDE Boston: Houghton Mifflin, copyright © 2004. page 2
- [5] Buenaflor, Lionel E. THE ART OF CRITICAL THINKING: LOGIC FOR FILIPINO STUDENTS-Mandaluyong City Books atbp. Publication 2004
- [6] Bassham, Gregory. CRITICAL THINKING: A STUDENT'S INTRODUCTION Boston: McGraw Hill, 2002. Pages 1-2

JOURNALS

- [1] Saygo, Lita A. DEVELOPING CRITICAL THINKING SKILLS-Bayambang, Pangasinan. PSU-CRC Faculty Journal, Vol. I No. 1 (Nov-Mar,2002) page 7-8,13.
- [2] Cuchapin, Erlinda D. TYPES OF QUESTIONS ASKED BY BSE STUDENT TEACHERS IN TEACHING MATHEMATICS I – Bayambang, Pangasinan: PSU-CRC Faculty Journal, Vol. I No. 1 (Nov-Mar 2002) page 46
- [3] "Eureka College of Arts and Communication Starch and Research Journal. Vol. I, No.3, 2008 Official Publication of the CAC research and Extension Office" page 25-32
- [4] "CENTRO ESCOLAR UNIVERSITY City of Malolos Official Faculty Research Journal. Vol. XIII, No. 1, 2007-2008" pages 1-7

- [5] "CENTRO ESCOLAR UNIVERSITY City of Malolos Official Faculty Research Journal. Vol. IX, No. 1, 2003-2004" pages 28-35
- [6] Kamali, Islamic Azad University, Journal of Language Teaching and Research Vol. 2, pp. 104-111, January 2011.

THESES

- [1] Cabacang, Maria Cora "Critical Thinking through Sample Activities in English among freshman in the University of Eastern Philippines".
- [2] Lopez, Marcos Y. (2004), "Development and Validation of Critical Thinking Infusion Lessons in Communication Skills for Freshman College Students".
- [3] Lopez, Marcos Y. (2008), "Critical Thinking Ability, Language Proficiency, and Academic Performance of Pharmacy, Nursing, and Dentistry of CEU- City of Malolos"
- [4] Estranero, Fernando N. (2007), "Development of Critical Thinking Skills and Learning Skills in High School Mathematics"
- [5] Angeles, Analyn M.(2012), "Personal and Environmental Factors as Correlates of Teacher's Sense of Self- Efficacy"
- [6] San Pascual, Rowena E. (2003) " Critical Thinking Skills and Academic Achievement in Philippine History and Government"

AUTHORS

First Author – Josan D. Tamayo, MIT, Centro Escolar University-Malolos, College of Management and Technology, City of Malolos, Bulacan, Philippines

Second Author – Jay-Arr C. Tayao, MIT, Centro Escolar University-Malolos, College of Management and Technology, City of Malolos, Bulacan, Philippines

Third Author – Marcos Y. Lopez, Ph.D, Centro Escolar University-Malolos, College of Management and Technology, City of Malolos, Bulacan, Philippines

Fourth Author – Margarita J. Mangalile, MBA, Centro Escolar University-Malolos, College of Management and Technology, City of Malolos, Bulacan, Philippines