



## Variates and Manipulative Skills on Computer Operations of High School Students of the University of Eastern Philippines System

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### *Author's contribution*

*The sole author designed, analyzed, interpreted and prepared the manuscript.*

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### **ABSTRACT**

This study aimed at examining the varieties and manipulative skills in computer operations of fourth year high school students of the University of Eastern Philippines System. A self-structured closed questionnaire with 5-point Likert scale was designed for data collection from a sample of 80 high school students and 6 teachers. This study employed the descriptive –correlational survey type of research design, Statistical tools such as frequency counts, percentages, mean, ranking and multiple regression were used to interpret and analyze the data. Findings revealed that the students were more skilled in terms with their manipulative skills in computer operations, more favorable attitudes while working in computer operation, and a very good academic performance showed in English, Mathematics, and Computer subjects.

*Keywords: Variates; manipulative skills; computer operations.*

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## **1. INTRODUCTION**

Many authorities in the field of education agreed that at any time an individual can learn and develop manipulative skills like computer operations of they will display concerted effort, and interests and perseverance through constant correct practice with a dedication to cope up with the rigors of life for the continuing development of the program of activity [1]. The use of the device in the actual learning computer of lesson needs conceptual skills. This means that one must have the ability to translate knowledge into practice in solving complex problems with the desired results in the performance towards a certain level of attaining the manipulative skills involving the special ability of proficiency.

Realistic change of each students' behavior and attitude requires evaluation by the school administration to emerge high scholastic performance. The ability to think conceptually, critically and analytically is a vital concern in education. Mastery learning is a cognitive undertaking that is relatively inherent within the behavior of the learner who must pursue to experience himself to a certain level of satisfaction. This means that a behavior change indicates the learning takes place and the attainment of manipulative skills changes behavior too. Computer education is a modern development in science and technology, with the electronic device providing the process of manipulation like storing and processing data [2].

Man had shown wider acceptance of the significance of the device in life and work to both young and adults. People nowadays are very eager to be familiar and to have a computer unit in every home for family use, with the desire to acquire manipulative skills, and try to venture doing computer operations themselves for they feel adept in their own ways to use the gadget. The attainment in manipulative skills to the fullest development of proficiency requires a special attitude in every individual. The academic performance of students and their manipulative efficiency in computer operations as a field of study in the high school curricular program added responsibility to teachers and school administration as well. Hence, evaluation needs specific areas in providing teaching-learning program, like a good and adequate learning environment meaningful to them.

Parents nowadays, feel the necessity to prepare their children's to prepare them to acquire the much-needed skills for good job opportunities.

The effort of the government to support the students to attain certain level skills provided by CHED, TESDA, and DepEd, as training institution [3].

A purge policy has been issued along this line concomitant to its vision, goals and objectives in line with the national industrialization task and programs cherished to uphold and turning out graduates to be fully aware and computer literate to keep them abreast the advancement of science and technology. Individual students should be serious if given varied opportunities by the government to learn a trade in keeping them employable anywhere in the world today. While the government is spending huge amounts of budget for education, parents too must find ways within this vision of success, the education of children, towards enhancing significant opportunities for a productive and useful life.

The graduates are expected to serve the industrialization agenda of the government. The high-level awareness of employment abroad is indeed very clear. Only few care working in domestic agencies; greater number are inclined abroad. Many crucial issues that influence young people to study technical education is that they want to land better jobs anywhere in the world for the socio-economic status advancement of their family.

The main purpose of this study was to find out the variates and manipulative skills on computer operations of high school students in the University of Eastern Philippines system. Specifically, the study was aimed to: Determine the profile of the respondents in terms of: age, sex, educational attainment of parents, monthly income of parents, possession of the family /personal computer, computer literate household; Know the level of manipulative skill of the respondents on computer operations; Determine the attitude affecting the manipulative skills of the respondents in computer operations; Know the level of academic performance of the respondents in computer operations; Know the problem that affected most the manipulative skills on computer operations of the respondents; Determine the significant relationship between the respondents' profile and the level of manipulative skills on computer operations of the respondents; and Determine the significant relationship between the manipulative skills to the level of attitude, academic performance and problems encountered by the respondents.

## 2. METHODOLOGY

This study was conducted in the three campuses of the University of Eastern Philippines system. Due to the integration of UEP-PRMC campus and also of the UEP-LNTS, the enrollment of the high school was limited to only 25 students. With the passage of the new law integrating some CHED supervised institution, the former Pedro Rebadulla Memorial Agricultural College (PRMC) in Catubig, and the Laoang National Trade School (LNTS) are now under the umbrella of the University of Eastern Philippines system, Catarman, Northern Samar.

This study utilized the descriptive-correlational survey method wherein the data and information are taken from the three high school departments of the University of Eastern Philippines were analyzed. All data were derived through the survey questionnaire based from the statements of the problem of this study. To determine the extent of manipulative skills, questions were premised on the seven-item on the statement of the problems in this study.

### 2.1 Data Collection Tools

To determine the extent of manipulative skills questions were premised on the seven-item on the statement of the problems indicated in the survey questionnaire formulated in such a way that the needed data be put in place in the instrument, namely, profile of the respondents, and the manipulative skills on computer operations of the respondents with the following subject areas in the study of computer lessons for high school curriculum, that is, Microsoft windows, Microsoft words, Microsoft excel, and Microsoft Power point, with adjectival indicators ranges from 1-5 scoring to determine the level of mastery on computer operations of the respondents.

The respondents of this study involved eighty (80) high school students of the University of Eastern Philippines main, PRMC campus and Laoang Campus. These respondents were taken randomly from fourth year high school students only. The respondents were eighty (80) considering the maximum number of students per class is only 25-30. The three campuses has: UEP-Main (27), UEP-Laoang (28), and UEP-Catubig (25), a total of eighty (80) students. To validate the performance of the students, six (6) teachers were involved to answer survey questionnaire for comparison and to justify the

validity of answers made by the student-respondents, particularly within the areas of academic performance. The fourth-year high school students of the University be involved in this study were determined based on their demographic profile, academic performance, attitude affecting mastery of computer operation, problems encountered, and the possible suggestions that may be offered for the improvement of the teaching-learning program in the field of computer education.

The respondents in this study were taken from the three campuses of the University of Eastern Philippines system. Considering the limited enrolment purposive sampling technique was availed to determine the total populations. At first the researcher took the list and names of the fourth year enrolled during the school year 2008-2009. Data gathering relied primarily on the researchers' prepared survey questionnaire distributed personally to the respondents.

A prepared survey questionnaire was the main instrument in the data gathering tool which will consist of two parts. Part 1 focused on the profile of the respondents, part 2 included the manipulative skills in terms of Microsoft windows, Microsoft word, Microsoft Excel and Power point, part 3 included the level of attitude, part 4 included the academic performance and part 5 included the problems encountered by the Fourth Year students.

Frequency counts and percentage were used to present the data in table forms to have the appropriate tabular and textual itemization and discussion. Items that needed the computation for mean score and ranking were presented also in table forms, most especially in the demographic profile of the respondents within the limits also of the independent and dependent variables.

To determine and test the working hypothesis, the multiple regression analysis was be used.

For percentage and mean, the following computation were used:

$$P = n/N \quad (100\%)$$

Where,

P=Percent.

n =Score.

N= Total population.

For mean computation

$$M = \frac{Ex}{n}$$

Where,

M= score.

Ex= sum of score.

n = score.

To determine the working hypotheses the data were tested through regression statistical analysis .05 levels.

### 3. RESULTS AND DISCUSSION

In this study, Table 1 presents the frequency distribution on the profile of the least 8 or 10 percent had ages ranging from 13-14 years old. In terms of sex majority 47 or 59 percent were female and 33 or 41 percent were male.

On the educational attainment of parents 3- or 38 percent were BS degree holder and the least was 1 or 1 percent who obtained PhD. Degree. Others, 21 or 26 percent had Master's degree program. It also shows a greater number 29 or 36 percent having monthly income of Ph15, 000- Ph 19,000 and the least, 9 or 11 percent earned Php 9, 000 and below monthly. As to the number of brothers and sisters, 48 or 60 percent had 2-3 children and the least, 10 or 12 percent had only one child. Most of the household 54 or 60 percent possessed a family computer, and those who confirmed that they know computer operation were 66 or 83 percent, while 14 made and the opposite observation. Respondents also affirmed that 43 or 54 percent among the household members were moderately literate, while 25 or 31 percent were adequately literate, while 9 were less literate; however, there was 3 or 4 percent who considered themselves highly literate in computer operations.

**Table 1. Frequency distribution on the profile of the respondents**

Profile	Frequency	Percent
Age		
15-16 years	72	90
13-14 years	8	10
Total	80	100
Sex		
Male	33	41
Female	47	51
Total	80	100
Educational Attainment		
PhD /Ed.D degree holder	1	1
Master's Degree	21	26
BS degree with MA units	13	16
BS degree holder	30	38
Undergraduate	15	19
Total	80	100
Family Income		
Ph 25,000 and above	13	16
Ph 20,000 – Ph 24,000	8	10
Ph 15,000 – Ph 19,000	29	36
Ph 10,000 – Ph 14,000	21	26
Ph 9,000 and below	9	11
Number of siblings in the family		
4 and above	22	28
2-3 children	48	60
1 child only	10	12
Total	80	100
Possession of family personal computer		
One unit with complete accessories	54	51
Two units with complete accessories	26	32
Total	80	100

### 3.1 Level of Manipulative Skills in Computer Operation

Majority of the Programs in the computer used by the students revealed that they are already familiar with the different windows environment and basics of MS Word, MS Excel and Power point. The findings of this study supports the study of Salas and Cannon Bowers [4] that computer skill training, in particular, has been ranked as the most important issue in human resource development by a national survey. Of the more than \$55 billion spent annually on formal training activities by U.S. organizations, computer skill training is the most frequent type of training provided more frequently than supervisory training, communication training, and sales training. Investing in more and better computer skill training has been named one of the most profitable avenues toward achieving the

productivity and quality gains sought by organizations investing in information technology.

### 3.2 Level of Attitude in Computer Operations

Table 3 shows the mean distribution of the of the respondents' level of attitude towards computer operations. Data revealed out of 12 items indicator, all were rated "More favorable" with a mean score of 3.92.

### 3.3 Problems Encountered in Computer Operation

Table 5 shows the mean distribution of the problems encountered in Computer Operations by the respondents. Data revealed that out of 10 items, students indicated "Serious" with a grand mean of 3.34.

**Table 2. Frequency distribution on the level of manipulative skills in computer operation**

Name of the program	Mean	Interpretation
Microsoft windows	3.85	More skilled
Microsoft word	4.15	More skilled
Microsoft excel	4.0	More skilled
Microsoft power point	3.98	More skilled

**Table 3. Frequency distribution on the level of attitude in computer operation**

Attitude	Mean	Interpretation
1. Eagerness	4.0	More favorable
2. Willingness	3.96	More favorable
3. Excitement	4.16	More favorable
4. Thankfulness	4.06	More favorable
5. Consciousness	3.96	More favorable
6. Amused	3.65	More favorable
7. Determination	3.96	More favorable
8. Fulfilment	4.01	More Favorable
9. Satisfaction	4.06	More Favorable
10. Awe	3.75	More Favorable
11. Inspired	3.98	More Favorable
12. Awe	3.54	More Favorable
Grand Mean	3.92	More Favorable

**Table 4. Frequency distribution on the academic performance of the respondents**

Performance	Frequency	Percent
Very good	58	73.5
Good	22	27.5
Total	80	100%

**Table 5. Problems encountered by the respondents**

<b>Problems encountered</b>	<b>Mean</b>	<b>Interpretation</b>
1. Nervousness	3.29	Serious
2. Lack of time	3.60	More serious
3. Limited units of Computer	3.61	More serious
4. Conflict towards Instruction	2.95	Serious
5. Lack of Cooperation	2.95	Serious
6. Health Problems	3.26	Serious
7. Disturbance	3.45	More serious
8. Lack of program/software	3.69	More serious
9. Personal Problem	3.39	Serious
10. Unfamiliarity	3.23	Serious
Grand Mean	3.34	Serious

### **3.4 Test of Relationship Between the Respondents' Profile and the Level of Manipulative Skills in Computer Operations**

To test the null hypothesis that there is no significant relationship between manipulative skill and computer operation and profile of the respondents, multiple regression was used.

Table 6 presents the summary results on the relationships between the (dependent variable) manipulative skills in computer operation and (independent variables) profile of the respondents in terms of age, sex, educational attainment of the parents, family income, number of siblings, possessions of the computer and computer literate household. Out of 10 independent variable, the age was found to be significantly related.

#### **3.4.1 Age**

In terms of Age, it was found to be significantly related to manipulative skills with the F value of .495 which is greater than its significant F of .484. Therefore, the null hypothesis was rejected. This implies that regardless of age, manipulative skills are affected.

#### **3.4.2 Sex**

In terms of sex, it was found not significantly related to the manipulative skills with the F value of 9 which is less than the significant F or .664, therefore the null hypothesis was accepted. This implies that irregardless of sex, the manipulative skills are not affected.

#### **3.4.3 Educational attainment**

With regards to educational attainment, it was found not significantly related to manipulative skills with the F value of .267 which is less than

its significant F of .607; therefore, the null hypothesis was accepted that regardless of educational attainment, the manipulative skills are not affected.

#### **3.4.4 Family income**

In terms of family Income, it was found not significantly related to the manipulative skills with the F value of 0 which is less than its significant F of .975.

Therefore, the null hypothesis was accepted that there was no significant relationship between family income and the manipulative skill of the respondents.

#### **3.4.5 Number of siblings in the family**

With regard to the number of siblings in the family, again it was f More Favorable found not significantly related to manipulative skills with the F value of .0 which is less than its significant F of .576. Therefore, the null hypothesis was accepted. This implies that despite on the number of siblings, the manipulative skills are not affected.

#### **3.4.6 Possession of the family computer**

In terms of possession of the family computer again, it was found not significantly related to manipulative skills with the F value of .314 which is less than its significant F of 576. Therefore, the null hypothesis was accepted. This implies that there is no significant relationship between possession of the family computer and manipulative skills of the respondents.

#### **3.4.7 Computer literate in the Family**

In terms of computer literate in the family, again it was found not significantly related between the f value of .0 which is less than the significant F of .986. Therefore, the null hypothesis was accepted.

This implies that there was no significant relationship between having computer literates in the family and manipulative skills of the respondents More Favorable.

These findings supports Aarts and Dijksterhuis, et. al. [5] study on Social cognitive theory is highly consistent with this developmental account of skill acquisition, specifically identifying the establishment of knowledge structures as a key mechanism governing observational learning. The present research investigated whether modeling-based computer skill training can be improved further by incorporating either of two techniques previously shown to be effective in supervisory skill training: symbolic mental rehearsal (SMR) and reciprocal peer training (RPT). The nature of the skill set used by individuals using computer application software such as word processing, databases, spreadsheets, and electronic mail to perform workplace tasks is thought to be a blend of cognitive and perceptual–motor competencies.

### 3.5 Test of Relationship between the Level of Manipulative Skills and the Level of Attitude, Academic Performance and Problems Encountered

#### 3.5.1 Attitude level

In terms of attitude level, it was found not significantly related to manipulative skills with the F value of .595 which is less than the significant F of.807, therefore, the null hypothesis was accepted. This implies that regardless of attitude level, the manipulative skills are not affected.

This supports the study of Roberts and MacLeod [6]. In SMR, behavioral observation and symbolic coding are followed by mental rehearsal that explicitly relies on these summary verbal codes of the target behavior as a cognitive guide. Two meta-analyses of research outside the context of behavior modeling concluded that mental practice in general has a significant effect on performance, and the effect tends to be stronger for tasks that have a greater cognitive component.

#### 3.5.2 Academic performance

In terms of the academic performance of the respondents, it was found significantly related to manipulative skills with the F value of. 22 which is greater than the significant F of .14; therefore, the null hypothesis was rejected to the manipulative skills accepted. This implies that the academic performance affect manipulative skills. This findings supports the study of Gimilio R. G. [1], Information technology Integration and Student Academic achievement in Mathematics and Science. He found out that manipulative skills has a significant effect in achieving students' academic performance.

#### 3.5.3 Problems encountered

In terms of problem encountered, it was found that attitude of the respondents is not significantly related to manipulative skills with F value of .487 is greater than the significant F of.467. Therefore, the null hypothesis was rejected. This implies that the problems encountered by the respondents affect the manipulative skills.

**Table 6. Summary results on the relationship between manipulative skills level, the dependent variable and the profile of the respondent**

Independent variable	F ratio	Significant	Coefficient of determination	Interpretation
X1 – Age	.495	0.484	0.65%	Significant
X2 – Sex	.9	0.664	0.25%	Not significant
X3 – Educational Attainment	0.267	0.607	0.35%	Not significant
X4- Family Income	0	0.975	0%	Not significant
X5 – no. of siblings	0	0.977	0.00%	Not significant
X6 – Possession of the family computer	0.314	0.576	0.41%	Not significant
X6-computer literate household	0	0.989	0%	Not significant

**Table 7. The summary result on the relationship between the level of the manipulative skills, the dependent variables and attitude level, academic performance and problems encountered**

<b>Independent variable</b>	<b>F-ratio</b>	<b>Significant F</b>	<b>Coefficient of determination</b>	<b>Interpretation</b>
X8- Attitude Level	0.595	0.807%	0%	Not significant
X9 – Academic Performance	0.22	0.14%	2.83%	Significant
X10 – Problems Encountered	0.487	0.467%	0.63%	Significant

#### 4. CONCLUSION AND IMPLICATIONS

Guided by the vital findings of the study, the following conclusion were drawn:

- ❖ The respondents are generally female students. The educational attainment of the parents were BS degree holders, with minimum monthly income who possess a family computer and mostly by with family members who are literate in computer operation. This implies that they were qualified and well experienced in manipulating computer operation.
- ❖ As to the Manipulative performance of the respondents of the four components learned in computer operations more were skilled in Microsoft Offices. This implies that students can deal basic hands-on techniques and can execute basic hands-on technique in their own way of manipulating computer operations.
- ❖ Academic Performance of the respondents are “very good”. This implies that they understand fully and can interpret the needs of computer environment as applied with their other academic subjects.
- ❖ The manipulative skills were significantly related to academic performance and problems encountered in computer operations except the level of attitude. This implies that academic performance and problems encountered influence manipulative skills in computer operation. The higher performance the student achieves, the higher also is his/her manipulative skills in computer operations.

#### 5. RECOMMENDATIONS

Based on the findings the following are herein under recommended:

- ❖ The school administration must give full attention to students’ needs.

- ❖ The school must work hand in hand with the school personnel to provide education with students for a better community.
- ❖ The school should provide more computer units, program/software installed for the benefit of the students to familiarize them with computer education.
- ❖ It is recommended that additional sources of funds be provided to procure additional units.

#### CONSENT AND ETHICAL CONSIDERATIONS

Prior to data collection, the researcher seeks approval from the school heads of the three (3) campuses, with a formal letter approved by the Campus Director to conduct, and administer a survey by using a survey questionnaire to obtain data relevant to the present study. The letter was also approved by the research coordinator, and the proposal was presented during the In-house Review for Proposal Hearing conducted at the UEP-Main campus. As per international standard or university standard, respondents’ written consent has been collected and preserved by the author’s.

#### COMPETING INTERESTS

Author has declared that no competing interests exist.

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