The Correlation between Information Technology Use and Students' Grades in Yanbu University College

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Abstract

This study considers the degree of correlation between students' grades expectation and the use of technology. To approach this issue, anassessment of the degree of Information Technology use among students in Yanbu University College (YUC or College) was used. Correspondingly, the students' grades expectation was also asked. The instrument used in this study was a survey asking the students of their grade expectations and their computer usage.Two academic departments were involved in this sutdy Computer Science (CS) and Management Information System (MIS) and more than 500 students participated in this study. The results showed that the use of Information Technology is a factor in the students' grades improvement

Keywords: Degree of Information Technology use, IT in higher education, Technology and higher education, Correlation, Academic Achievement, Grades.

Introduction

Yanbu University College (YUC) is located in Yanbu Industrial City. A city that has more than 20 manufacuring plants producing wide range of products that are mainly petrolem-driven. YUC offers two types of certification targeted toward awarding students Associate Degree or Bachelor Degree in CS, MIS and other fields. These programs were tailored to fulfillthe manpower needs of this area.

Donoghue et al. (Donoghue and Worton 2005) pointed that students' learning is improved by integrating technology in their educational process. This idea has been examined from various angles that it looks like most of the literature tends to agree with Donoghue. On the practical side, given the variety of theoretical and applied science courses the College offers make it essential that Information Technology be extensively used in its classrooms.

Literature Review

Shoffner (2009) found out that people who use computer for their personal tasks like emails and social media have a higher tendency towards adapting technolgoy in their professional environment.

Harwood et al.(Harwood and McMahon) study which was about the correlation between Video-based Learning Materials and students achivements. He asserted a positive affect between the two variables.

On the other hand, as cited by Harwood et al.(Harwood and McMahon), Berger et al. indicated that accepting technology as is will lead to wastage of the rsources interms of time and money, and finally poor instruction delivary. Based on his recommendations, the involvement of education professionals with all members of

instructional technology team during the technology development process is of imperative necessity for the success of the integration and application of the instructional materials.

It was mentioned by Thomas Fuchs about what is known that the importance of the computer availability at home to increase the performance. Despite of that his study proves the opposite that having computers at home will affect negatively the students' performance especially in math and reading.

Angrist and Lavy claimed that there is no relation between CAI and the students high scores. They supported their point by enforcing the importance of the compatibility between the CAI programs and teaching strategy that used. (Angrist & Lavy 2002)

Research question

The research questions of interest in this paper is related to "how well students are going to achieve if they use technology in learning."

Research hypothesis

The research paper is testing the hypothesis that "Use of Information Technology does not affect students' grade"

Research design

The survey tool used for this study was selected to seek the respondent opinion in determining the effect of technology in students' learning experience at YUC. The survey designed by the researcher was given to the students in both departments as a measurement tool for their use of Information Technologyin these courses and to get their grade expectation. Students were asked to rate their responses on a six-level scale ranging from 0 to 5: 0 (strongly disagree), 1 (disagree), 2 (neutral), 3 (true sometimes) 4 (agree) and 5 (strongly agree). Also, the instrument was designed to get the students expectations of thier grades in the same courses that they measured in the degree of thecnology use.

Population Of The Study

This study was applied to YUC students where specifically two academic departments were involved: Computer Science (CS) and Management Information System (MIS) Departments. More than 500 students from both genders particpated in this study. The courses of interest were mainly lab-driven courses.

Method Of Data Collection

To encourage MIS and CS students to participate in the survey, an annoucement over YUC website was conveniently administered. This convenience sampling had set of questions. The first set was directed with 6 categorical selections "strongly disagree, disagree, neutral, true sometimes, agree and strongly agree." The second set was targeted toward students expected achivements with 9 mutually execlusive responses "A+, A, B+ B, C+ C, D+, D and F."

Data Analysis

The data collected by the survey was analyzed using Excel and SPSS. Excel was used to prepare the data for analysis. SPSS was used to perform the Chi-Square and Correlation. A generation of three data sets have been prepared. The first data set "Question Agreement Dataset" designed with variables (Course, Campus, Section, ResponseType and CountSaying). The second data set "X-Index" prepared with variables (Subject, Male and Female). The third data set "Expected Marks dataset" included variables (Course, Campus, Section, Expectation, Count Expecting).

Using chi square test, we compare the proportions of answers for both the male and the female campus.This paper, given the same degree of freedom of 5, calculated a chi square results of 0.000754784 which implied that they are not dependent.

It has been noticed that most of the answers are clustering around "TrueSometimes." However, the responses are not independent of the courses. There are courses that tend to get a certain type of response.
3a. CS330 and CS101 has a tendency to get many "TrueSometimes."
3b. CS490 has a tendency to get many "Agree."
3c. CS201 and CS203 has a tendency to get many "Neutral."
3d. Surprisingly, "Strongly Disagree" is low among all the courses.

Using Procedure 2.0, expected marks tend to vaguely mimic a bell-curve in CS 101, CS102, CS203 and CS330. However, in CS 490, almost everyone is expecting a high mark, with "C" being the lowest. In particular, in the male campus, the expectation is skewed to the right. Moreover, in the female campus, the expectation is closer to the normal curve. (Procedure 2.0 is a set of spreadsheet steps that prepares the data for further analysis.)

Using Procedure 4.0, when we relate the answers to the first question of "in agreement in the use of information technology" and those of "marks expectation," there seems to be clustering around "True Sometimes" and "Expecting B." (Procedure 4.0 is a set of spreadsheet steps that prepares the data for further analysis.)

Visualization check of Figure 1 and figure 2 shows that usage of computer in learning and expectation of high marks seem to coincide. This synchronization occurs at C_TrueSometimes and ExpectedMarks of B. From the mentioned analysis, it seems that students effectively use information technology. This is clear from their answers where they are really not perfectly sure on the use of information technology, a situation where most answered "true sometimes." This is correlated with their expected marks where most expects a "B", a one-step less than the maximum.

In order to further to check this visual observation, we perform Procedure 201. In this procedure we combined together the result obtained across courses. We likewise combined together the expected marks obtained across courses as well. It has to noted that we removed "F_SD" – "Strongly Disagree" as it can be considered outlier.

We now have a series of numbers presented as table, on the left column as QRES and on the right QEXP. (QRES – as the Response, QEXP – as the Expectation) By doing a line graph, we are able to see the correspondence between these two series.Since

they are related visually, we check statistically using a non-parametric approach using the Spearman's Rho Correlation. (This is used instead of the Pearson's Correlation – applicable to parametric data.)

Using SPSS, we have seen that they are correlated at 0.8 (1.0 is highly correlated.) significant at 10%. This is a very important issue. While in Social Sciences, we normally peg our significance at 5%, for this case, due to the little amount of data, we could stretch our significance at 10%. This suggest a hopeful but careful drawing of conclusion from this result.

Data Discussion (Finding)

In general, it is clear that most responses cluster around "True Sometimes". The responses are not independent of the courses. There are courses that tend to get a certain type of responses. For example, CS330 and CS101 tended to get many "True Sometimes" responses, CS490 recieved many "Agree" responses, and both CS201 and CS203 received many "Neutral" responses. Surprisingly, "Strongly Disagree" is low among all the courses. Using the t-test, it appears that there is no difference between the male and female campus regarding their rating of Information Technology use in education.

Conclusion

As a general conclusion, this paper finds that the use of computer is not maximum nor is the expectation of the marks attainable because of it. However, compared to other scenarios, we found that the use of computers is on the high side of the middle band. Further, this is correlated to the marks expected at "B" band.

Further, while there are some studies indicating that the male students are using more computers than their female counterparts, in this study, we have positively proven that the use of computer is gender neutral.

Recommendation

The recommended output of this study is:

1. Technology use improve students learning experience
2. Technology use has a positive affect on students achievements.

A suggested further studies needs to investigate if the students technology use style would refelct students achievement.

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Appendix

Campus	(All)						
Row Labels	CS101	CS102	CS201	CS203	CS330	CS490	Grand Total
A	4	9	8	10	4	13	48
B	8	7	4	22	8	7	56
C	12	14	7	14	6	1	54
D	5	7	1	3	5	0	21
F	2	0	0	0	0	0	2
Grand Total	31	37	20	49	23	21	181

Table 1: Procedure 2.0 Grades Expectation (Male & Female) by grades

Campus	(All)					
Row Labels	A	B	C	D	F	Grand Total
CS101	4	8	12	5	2	31
CS102	9	7	14	7	0	37
CS201	8	4	7	1	0	20
CS203	10	22	14	3	0	49
CS330	4	8	6	5	0	23
CS490	13	7	1	0	0	21
Grand Total	48	56	54	21	2	181

Table 2: Procedure 2.0 Grades expectations (Male & Female) by courses

Campus	(All)						
Row Label	A_StronglyAgree	B_Agree	C_TrueSometimes	D_Neutral	E_Disagree	F_Strongly Disagree	Grand Total
CS101	4	7	17	0	3	0	31
CS102	2	9	17	0	7	2	37
CS201	4	5	3	3	5	0	20
CS203	9	16	12	9	1	2	49
CS330	2	3	15	0	2	1	23
CS490	3	9	3	4	2	0	21
Grand Tot	24	49	67	16	20	5	181

Table 3: Procedure 4.0 degree of technology use (Male & Female) by courses

	A_SA	B_AG	C_TS	D_NT	E_DA	F_SD	A_XP	B_XP	C_XP	D_XP	F_XP
CS101	4	7	17	0	3	0	4	8	12	5	2
CS102	2	9	17	0	7	2	9	7	14	7	0
CS201	4	5	3	3	5	0	8	4	7	1	0
CS203	9	16	12	9	1	2	10	22	14	3	0
CS330	2	3	15	0.1	2	1	4	8	6	5	0
CS490	3	9	3	4	2	0	13	7	1	0	0
											181
TOTAL	24	49	67	16.1	20	5	48	56	54	21	2

Table 4: Procedure 201 Grade expectaions by courses

			VAR00001	VAR00002
Spearman's rho	VAR00001	Correlation Coefficient	1.000	.800
		Sig. (2-tailed)		.104
		N	5	5
	VAR00002	Correlation Coefficient	.800	1.000
		Sig. (2-tailed)	.104	
		N	5	5
PEARSON'S CORRELATION= 0.729633				

Table 5: Procedure 4.0 Pearson's Correlation

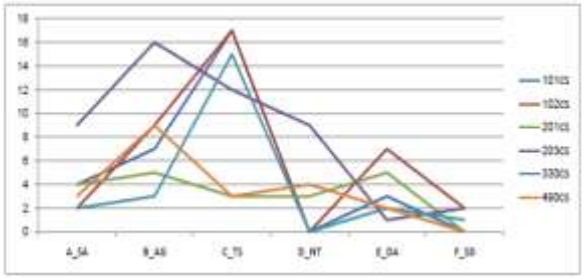

Figure 1: Degree of Technology use (Male & Female) by courses

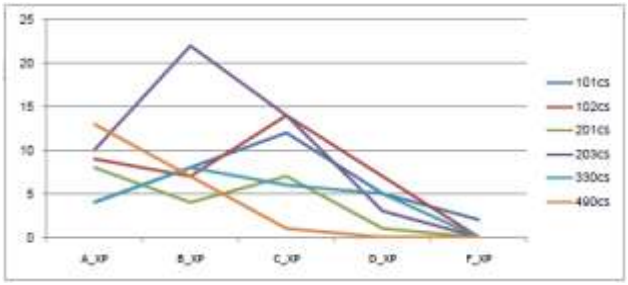

Figure 2: Exepcted Grades (Male & Female) by Course

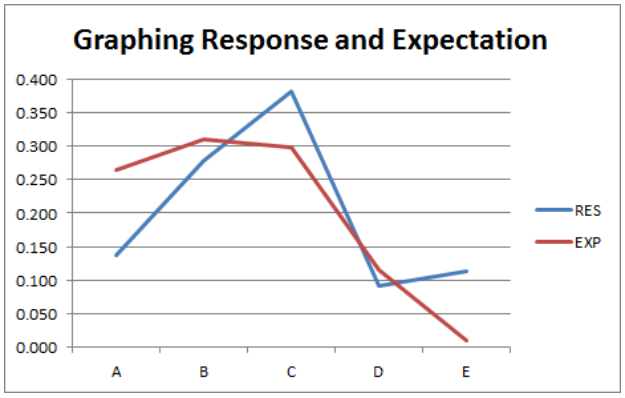

Figure 3:Procedure 201 Graphing Response and Expectation