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The Influence of Technology Towards Academic Performance of Computer Science Students in Sulu State College

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Abstract

The objectives of this study were to assess the level of influence of technology towards academic performance of computer science students and to determine the significant difference of the level of influence of technology towards academic performance of Computer Science students when data are grouped according to their sex, age and year level. Four research questions and one hypothesis guided the study. Survey approach and utilization of descriptive research design were used in this study and purposive sampling technique was used to select 50 students of Bachelor of Science in Computer Science. A checklist research questionnaire was used and administered in the Computer of Science Information Technology and Engineering (CSITE), Sulu State College, Sulu. The data gathered were treated with the use of frequency distribution, percentage, rank, weighted mean, t-test and ANOVA.

The result showed the average weighted mean of 3.78 for the overall responses on the level of influence of the technology towards academic performance of computer science students falls under AGREE. Findings also showed that there is a significant difference of the level of influence of technology towards academic performance of computer science students when data are grouped according to their sex and year, however, there is No significant difference exist when data are grouped according to year level and Facebook are Social Media Site most used by student-respondents.

Keywords: *Influence of Technology, Academic Performance, Computer Science*

INTRODUCTION

Higher education and technology are inseparably linked. Students nowadays rely heavily on technology such laptop, mobile phone and the all-encompassing internet to complete assignments, in many cases preferring the ease and speed on online access and sourcing over traditional forms of library-based research and note-taking.

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Technology of today, plays the role of facilitator in educating a student. It enriches the educational experience providing options that can accommodate students in their quest to learn. According to the study of Ibrahim, W.M. (2003), technology has an effect on student learning via communications, convenience, and control.

Increase accessibility of learning is one of the most important things technology has done for student. Using technology to facilitate student learning has come with many positive benefits to academic performance. Students can pick and choose what mediums they prefer to learn content and maximize their study time. Students have immediate access to anything they do not understand or want to learn more about. Students are no longer solely dependent on teachers, parents, or other educated people to be their only source of information. Students are in charge of their own learning and technology has leveled the playing field in many ways (Cindi Khalarian, 2015).

On the other hand, there are two sides to every story. While the positive far outweighs the negative, the downside of technology still exists. Misinformation has been around in the social media. But despite of these negative effects, technology would increase motivation and self-esteem of the students leading to good academic performance (Cindi Khalarian, 2015).

Technology are one of the tools that are now use today in our school, the Sulu State College. These tools could change the way instructors teach and the way students learn. According to Ivy M. T. (2019), among the many educational technology tools that are gaining popularity are the online collaboration tools. Online collaboration tools are web-based tools that allow individuals to do things together online like messaging, file sharing, and assessment. However, when new educational technology is integrated in the classroom, its effects must be determined as this is an essential component for evaluation. Having the tool is not enough, there has to be an evaluation of its quality to make it more effective. It was on this premise that the technology tool of Sulu State College specifically, in the School of Computer Science, Information Technology and Engineering (CSITE) was assessed.

Objectives of the Study

The main objective of this study was to assess the level of influence of technology towards academic performance of computer science students since Technology are one of the tools that are now use today in our school that could help improve the academic performance of the students. Specifically, this study would answer the following query;

1. What is the demographic profile of the respondents in terms of: (a) gender, (b) age, and (c) year level?
2. What is the level of the influence of technology towards academic performance of computer science students?
3. Is there a significant difference on the level of the influence of technology towards academic performance of computer science students when data are grouped according to their sex, age and year level?
4. What social media are most often use by students to facilitate learning from technologies?

Hypothesis

There is no significant difference on the level of the influence of technology towards academic performance of computer science students when data are grouped according to their sex, age and year level.

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METHODOLOGY

Research Design

This study made use of the descriptive research design utilizing Survey Questionnaire. This design is most appropriate in describing the influence of computer literacy to students' academic performance. According to Creswell (2009) descriptive research design describes what actually exists, determine the frequency with which it occurs, categorizes the information and provides a numeric description of trends, attitudes, perceptions or opinions of a population by studying a sample of that population. The questionnaire is the main instruments used to gather data needed in the study.

Research Locale

This study was conducted in the School of Computer Science, Information Technology and Engineering (CSITE), Sulu State College, Jolo, Sulu during the school year 2019 – 2020. Sulu State College is one of the best school in the province of Sulu which offered following courses; Bachelor of Science in Education (Elementary and Secondary Education), Bachelor of Science in Agriculture (BSA), Bachelor of Arts and Sciences (BSA), Bachelor of Science in Business Administration (BSBA), Bachelor of Science in Computer Science (BSCS), Bachelor of Science in Information Technology (BSIT), Bachelor of Science in Computer Engineering (BSCpE), Bachelor of Science in Biology (BSBio), and Bachelor of Sciences in Nursing (BSN).

Respondents of the Study

The respondents for this study consisted of 50 selected Computer Science students of Sulu State College, Jolo, Sulu. The respondents were purposely selected by year level. Selected students were taken purposely from each level regardless the number of male and female students.

Sampling Design

This research employed purposive sampling technique in the selection of the computer science student-respondents. This means, the researcher purposely selected 50 computer science students in each year level to be the sample size from the total population.

Research Instrument

The primary instrument that this study used was a check-list questionnaire adopted from Monserate, C. A. (2018) that consists of two parts. Part I is the profile of the respondents; and Part II deals with the influence of technology. Quantitative data of the survey was obtained by utilizing the 5-point Likert scale with the following equivalent; 5–Strongly Agree (SA); 4–Agree (A); 3–Uncertain (U); 2–Disagree (A) and 1–Strongly Disagree (SD).

Data Gathering Procedure

In the course of gathering the descriptive data, a letter duly approved by the Dean of Computer Science, Information Technology and Engineering (CSITE), Department was sought before the questionnaire was administered to the selected respondents. Upon receiving the approval of the request, the researcher went one by one to the Computer Science student-respondents for lunching of the questionnaire. The direction was read and explained to the respondents so as to minimize any problems or questions that may happen during the administration of the questionnaire. The Computer Science student-respondents rest assures that their responses to every question was strictly kept with utmost confidentiality. The fill out questionnaire was retrieved on the same day of the administration. The researcher personally coded, tabulate and analyze the collected data.

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Statistical Treatment of Data

The collected data was analyze using the following statistical tools: The study utilized simple frequency counts and percentages to describe the profile of Computer Science student-respondents in terms of: sex, age, and year level. Descriptive measures: The weighted mean and Standard Deviation were used to answer the level of influence of technology towards academic performance of Computer Science students. Inferential statistics: T-test and ANOVA were employed in determining the significant difference of the level of influence of technology towards academic performance of Computer Science students when data are grouped according to their sex, age and year level. Rank are used to determine some of the learning technologies (Social Media) most oftentimes use by students.

RESULTS AND DISCUSSIONS

1. *Demographic profile of the respondents in terms of: sex, age and year level*

1.1. In terms of sex

Table 1.1 shows the sex of the student-respondents. There are 32 or 64% male respondents and 18 or 36% are female respondents. This indicates that majority of the respondents are male.

Table 1.1. Profile of the Respondents in Terms of Sex

Sex	Frequency	Percentage
Male	32	64%
Female	18	36%
Total	**50**	**100%**

1.2. In Terms of Age

Table 1.2 shows the profile of respondents in terms of age. There are 20 or 40% belong to bracket "21 – 22 years old", 18 or 36% are 19 years old to 20 years of age, 5 or 10% belongs to bracket "17 – 18 years old and 23 – 24 years old", and 25 – 26 years old constitute 2 or 4%. This implies that majority of the respondents are 21 years old to 22 years of age.

Table 1.2. Profile of the Respondents in Terms of Age

Age	Frequency	Percentage
15 – 16	0	0%
17 – 18	5	10%
19 – 20	18	36%
21 – 22	20	40%
23 – 24	5	10%
25 – 26	2	4%
Total	**50**	**100%**

1.3. In Terms of Year Level

Table 1.3 shows the year level of student-respondents. There are 30 or 60% are 2nd year college students-respondents, 12 or 24% belongs to 1st year college students, 8 or 16% are 3rd year college students and no respondents from 4th year college students. This indicates that majority of the respondents are 2nd year college students.

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Table 1.3. Profile of the Respondents in Terms of Year Level

Year Level	Frequency	Percentage
1st Year	12	24%
2nd Year	30	60%
3rd Year	8	16%
4th Year	0	0%
Total	**50**	**100%**

2. Level of influence of the technology towards academic performance of Computer Science students.

Research question (2) is about determining the level of influence of the technology towards academic performance of computer science students at Sulu State College, Jolo, Sulu. Mean and standard deviation were used to accomplish this objective. Table 2 presents mean and standard deviation for each item of the influence of technology towards academic performance of students.

In reference to table 2, data show that all students-respondents in computer science agree that the use of technology have influence towards their academic performance. It is worth noting that students find working with computers enjoyable and interesting [M=3.98 (SD=1.040)] because technology will encourage them to learn beyond what is required and help/guide them how to apply the concepts they learned, develop students' higher order of thinking skills and creativity, and in using technology, they can print easily any documents or photos (3.94 & 3.92). Computer technology can also save files on specified folders and flash drives (3.88) which is the most important things that technology done for students to increase learning (3.72). Generally, the results of table 2, shows that the average weighted mean of 3.80 for the overall responses on the level of influence of the technology towards academic performance of computer science students falls under AGREE.

This table implies that students of Computer Science from first year to fourth year does not vary in their self-efficacy levels, with the scoring in the statements of the influence of using technology. Thus, the increasing trend in their skills, enjoyment and interest in learning has been revealed. This further implies that although their skills are still at the low and average levels, they find computers very enjoyable and that this technology makes learning very interesting. Students' enjoyment with computers corresponds with Binnur's findings that majority of students find computer-based classrooms make lessons enjoyable. His study on Effect of Technology on Motivation in EFL Classrooms also revealed that most students do not find technology in the classroom boring and unnecessary (Binnur, 2009).

Table 2. Means for the Level of Influence of Technology towards Academic Performance of Computer Science Students

STATEMENTS	Mean	SD	Description
1. I enjoy working with the technology like computers.	3.98	1.040	Agree
2. I find learning more interesting when technology are used.	3.82	0.850	Agree
3. Using computers makes teaching more interesting to students.	3.58	0.992	Agree
4. I am very confident to answers my assignments when I use technology.	3.66	1.099	Agree
5. Technology can make class presentations effectively using PowerPoint.	3.80	0.941	Agree
6. Technology can enhances students' self-esteem and gives due recognition to students performance.	3.68	0.828	Agree

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7. Technology allows students to think independently and make their own decisions.	3.80	0.857	Agree
8. Technology will encourages students to learn beyond what is required and help/guide the students how to apply the concepts learned.	3.94	0.890	Agree
9. Technology keeps accurate records of students' performance.	3.72	0.834	Agree
10. Technology seeks to provide information in answers to difficult questions.	3.90	0.931	Agree
11. Technology can develop students' higher order of thinking skills and creativity.	3.92	0.900	Agree
12. Technology can influence the academic performance of the students.	3.90	0.814	Agree
13. In using technology, students can print easily any documents or photos.	3.92	1.085	Agree
14. Computer technology can save files on specified folders and flash drives.	3.88	0.918	Agree
15. Technology can misuse to cyber-bullying.	3.64	0.898	Agree
16. Technology will enriches the educational experience of providing options that can accommodate students in their quest to learn.	3.76	0.894	Agree
17. Technology has an impact on student learning via communications, convenience and control.	3.68	0.978	Agree
18. Accessibility is the most important things of technology done for students to increase learning.	3.72	0.904	Agree
19. Using technology to facilitate student learning will influence positive benefits to academic performance.	3.78	0.910	Agree
20. Technology plays the role of facilitator in educating a student, thus it influences to enhance the academic performance of the students.	3.82	1.173	Agree
Total	**3.80**	**0.1135**	**Agree**

Legend: (5) 4.50 – 5.00 = Strongly Agree; (4) 3.50 – 4.49 = Agree; (3) 2.50 – 3.49 = Uncertain; (2) 1.50 – 2.49 = Disagree; (1) 1.00 – 1.49 = Strongly Disagree

3. Significant difference of the level of influence of technology towards academic performance of Computer Science students when data are grouped according to their sex, age and year level.

3.A. According to Sex

Table 3.A reveals that *t*-computed value is 7.278 and *t*-critical value is 2.024. It indicates that *t*-computed value is greater than *t*-critical value at 0.05 level of significance. Therefore, the null hypothesis is rejected. This indicates that there is a significant difference on the level of the influence of technology towards the academic performance between male and female respondents. It is because the impact of technology on a student's academic performance depends on the interest and enjoyment of male or female students in using with it.

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Table 3.A. Computed t-Value between Means of Female and Male

Gender	Mean	SD	Mean Difference	t-Computed Value	t-Critical Value	Decision	Interpretation
Male	4.025	0.1686	0.353	7.278	2.024	Reject H_0	Significant
Female	3.672	0.1366					

alpha set at 0.05 level of confidence

3.B. According to Age

Table 3.B presents the significant difference on the level of the influence of technology towards academic performance of computer science students when data are grouped according to their age. Here, we can see that the *F*-value of 1.457 is less than the *F*-critical value of 2.725 for the alpha level selected (0.05). Therefore, we have evidence to accept the null hypothesis. This implies, that using technology will encourage all age level of the students towards their self-esteem in order to learn beyond what is required and help or guide them how to apply the concepts learned.

Table 3.2. ANOVA Summary Table for significant different on the level of influence of technology towards academic performance of Computer Science students according to Age

Sources of Variations	Sum of Squares	Degrees of Freedom	Mean Squares	F	F-crit	Decision	Interpretation
Between Groups	0.239	3	0.080	1.457	2.725	Accept H_0	Not Significant
Within Groups	4.152	76	0.055				
Total	**4.391**	**79**					

alpha set at 0.05 level of confidence

3.C. According to Year Level

Table 3.C shows that the level of influence of technology towards academic performance of computer science students when data are grouped according to their year level, statistically have significant difference, since the computed *F*-values 28.859 is greater than tabular value of 3.159 at α=0.05 level of significance and say that at least one of the three samples have significantly different means on the influence of technology towards academic performance of computer science students according to their year level and thus belong to an entirely different population.

Table 3.C. ANOVA Summary Table for significant different on the level of the influence of technology towards academic performance of computer science students according to year level

Sources of Variations	Sum of Squares	Degrees of Freedom	Mean Squares	Computed F	F-crit.	Decision	Interpretation
Between Groups	1.868	2	0.934	28.859	3.159	Reject H_0	Significant
Within Groups	1.845	57	0.032				
Total	**3.713**	**59**					

alpha set at 0.05 level of confidence

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Table 3.C.1 presents, a Post Hoc Analysis using Bonferroni approach was conducted to determine which among groups classified according to their year level to have different levels of mean in the influence of technology towards academic performance of computer science students in Sulu State College, Jolo, Sulu.

Here, we can see that the p-value of (A vs B) and (A vs C) is less than the alpha level selected (α= 0.05). This means that groups A and B & groups A and C have less than 5% chance of belonging to the same population. Whereas for (B vs C) it is much greater than the significance level. This means that B and C belong to the same population. So, it is clear that A (1st Year college students) belongs to an entirely different population. The result means, that the 1st year college students have different level of interest in using technology, maybe because, it depends on their time of availability. However, we can say that generally, the influence of technology had a significant effect on the performance of students.

Table 3.C.1. Between Means of group A and group B

Group	Mean	t-Computed Value	p-value	Decision	Interpretation
A	3.540	6.738	0.0000	Reject H_0	Significant
B	3.914				

Between Means of group A and group

Group	Mean	t-Computed Value	p-value	Decision	Interpretation
A	3.540	6.395	0.0000	Reject H_0	Significant
C	3.915				

Between Means of group A and group

Group	Mean	t-Computed Value	p-value	Decision	Interpretation
B	3.914	0.0145	0.9885	Accept H_0	Not Significant
C	3.915				

alpha set at 0.05 level of confidence

4. Social Media Site most used

Table 4 shows the Social Media Site most used of student-respondents. Out of 93 responses, there are 42 of the respondents are using Facebook, rank first. Followed by Youtube with 22 responses. Third in rank are Twitter and Instagram with 10 responses and last in rank is the Snapshot with 9 responses. This implies that the majority of the respondents are logging on Facebook for communication with their classmates purposely inquiring school activities, assignments or reports to enhance their academic performance.

Table 4. Learning Technologies (Social Media) most often used by Students

Social Media Site	Frequency	Percentage	Rank
Facebook	42	45.16%	1
Twitter	10	10.75%	3
Instagram	10	10.75%	3

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Snapshot	9	9.68%	4
Youtube	22	23.66%	2
Total	**93**	**100%**	

Conclusions

Based on the findings, the researchers came up with following conclusions: (1) the majority of the students' respondents are male 2nd year college Computer Science students. (2) Student-respondents are in 21 years old to 22 years of age which are normal age parallel to their year level. (3) That on the average, the Computer Science students generally agree that technology have influence towards academic performance. (4) There is a significant difference of the level of influence of technology towards academic performance of Computer S students when data are grouped according to their sex and year level. However, there is no significant difference exist when data are grouped according to their age. (5) Facebook are Social Media Site most used by student-respondents to facilitate learning.

Recommendations

Out of the findings and conclusions drawn out from this study, the following recommendations have been formulated:

1. School administration must provide computer facilities accessible by all year levels to provide students adequate opportunities to utilize computers.
2. Available computer packages, especially in the Computer Science department, must be maximized by encouraging students to use them more often.
3. Students in the lower years should be given more opportunities to utilize technology through various activities since they are just as self-efficient as the students in the higher year levels.
4. Faculty should allow students to actually use technology by themselves in order to develop higher-order thinking skills and must focus on enhancing over-all teaching effectiveness to help students learn better.
5. Faculty should undergo advanced computer technology training to help them enhance presentations, make use of the spreadsheet for grade computation and design activities which would allow students to integrate computers in their projects and outputs.

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