

The Paradox on IT Literacy and Science's Learning Achievement in Secondary School

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ABSTRACT

Higher education is currently in the rapid change process. These changes are driven by many factors, both internal and external. Some trends in higher education development occur on a wider social context. People feel more comfortable with using the internet as a tool in the day-to-day teaching and learning activities. Information and communication technologies have an important role to help improve teaching and learning process. The aim of this research is to determine whether the student IT literacy medium influence the learning achievement of sciences subject. This research is a quantitative research using multivariate statistical analysis techniques. The result shows that IT literacy has no effect on learning achievement. This phenomenon indicates the paradox on learning and ICT issues.

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1. INTRODUCTION

Higher education is currently in the rapid change process. These changes are driven by many factors, both internal and external factors. Higher education is facing the situation to use the new ways to organize teaching and learning to be better. This is to make it more possible to organize lectures for students with a variety of different characteristics and wider coverage area of learning. Nowadays, flexibility is the key concept of learning and technology is a key tool to support learning interaction [1].

One of some trends in higher education development is the wider social context in their activities. The first of the social contexts is virtualization. People feel more comfortable with using the internet as a tool in the day-to-day activities and interactions. Various social activities have been growing rapidly through the network, and this also includes education. The second one is life-long learning. New findings adopted by the services industry are the need to constantly update and increase knowledge. Students learning activities in the whole context are influenced by the changes in the industry. The third is learning flexibility. In the service industry, the paradigm shift from mass production which in the previous era had not given opportunity to differences users to mass customization. By the changing of technology and the delivery technique, the paradigm turned into mass customization. Thus, flexibility is important for customer oriented (individualized).

Brown and Duguid [2] view that learning is now a synthesis of *demand-driven*, a *social act*, and *as identity* information. In one perspective, *demand-driven* in the context of the problems faced in the workplace. This creates a need for learners who are able to solve problems through the power and performance based on the success of the solution. While the learning perspective as social action, the literature currently leads the cognitive emphasis, how people socially construct meaning, social adequacy and cultural norms. In the process of learning student will not acquire only the skills and laws but also the

confidence, and the other norms. Through learning, they use a new lens to look at the phenomenon differently. Learning becomes the information identity [3].

Information and communication technologies has important role to help improve teaching and learning process [4]. Learning in science today relatively has not used IT effectively at school. On the other hand, it is common that high school students use a sophisticated gadget in their activities; but not for learning. The aim of this research is to determine whether the student IT literacy influence the learning achievement in learning science subject.

2. RESEARCH METHOD

This research was a quantitative research using multivariate statistical analysis techniques, i.e. linear regression analysis. The subjects of this research were high school students who were in their grade 11. The confidence level was 95% or 5% significance level. The sampling technique used purposive cluster sampling. The numbers of respondents were 72 students from two classes, each consisting of 36 students. The instrument of IT literacy includes understanding aspects of the virtual world and computer skills. Learning achievement is measured by giving 20 questions about science and IT literacy is measured by giving 10 questions related to IT literacy. Both instruments have been validated previously on their construct and statistical validities.

3. RESULTS AND ANALYSIS

The results show that using descriptive analysis the average achievement in science learning is 73.96 out of 100 with a standard deviation of 11.26. The average of IT literacy is 25.8 out of 40 with a standard deviation 5.07. Pearson Correlation between Learning Achievement and IT Literacy is 0.059 with a significance value is 0.625 that greater than 0.05. These results indicate that IT literacy does not have a significant correlation with academic achievement. It is a paradox in this situation. On one side is expected to be an increase in achievement when facilitated by IT. Apparently this does not happen among the subjects.

Table 1. Correlations

		Learning achievement	Computer & IT Literacy
Learning achievement	Pearson Correlation	1	.059
	Sig. (2-tailed)	.	.625
	N	72	72
Computer & IT Literacy	Pearson Correlation	.059	1
	Sig. (2-tailed)	.625	.
	N	72	72

The same results can also be seen when the statistical analysis used is linear regression, as in Table 2.

Table 2. Linear Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	70.591	6.978		10.116	.000
	Computer & IT Literacy	.130	.265	.059	.492	.625

^aDependent Variable: Learning achievement

From the Table 2 it can be seen that IT literacy has no effect on learning achievement. The value of the significance is 0.625. Advanced research is needed to find an explanation of this paradox phenomenon and provide solutions in the learning process.

3.1. IT Literacy

The survey results revealed that the students' IT literacy apparently did not have a significant effect on learning outcomes. There are several possibilities that can be used to explain this. Theoretically, students who have well IT skills will be better able to find more information and complete relevant learning material [3][5][6]. The possible influenced factor is the lack of interaction between students learning physics obtained

by the students in the use of IT activities. That is, students take advantage of IT for outside activities to enhance the understanding of physics. Search more likely students are reluctant to make use of IT for learning resources tend to be a bit of physics expected in cyberspace. Second, teachers may not yet see the importance of IT, especially information on the internet as an alternative source of learning physics. Teachers tend to not encourage the use of learning IT.

3.2. Portrait Internet Users in Indonesia

Based on a survey conducted by Markplus, it can be figured out that the landscape of the internet is very promising for many investors in the world. The increasing number of Internet users is very significant from year to year. The following table shows the Internet user penetration in Indonesia for year from 2010 to 2012.

Table 3. Internet User Penetration in Million [7]

	2010	2011	2012
Urban Population	121.16	123.24	123.57
Urban Family	30.29	30.81	31.61
Urban Netizen Population	37.56	50.53	56.38
Netizen Population	42.16	55.23	61.08
Total Internet User Penetration	17%	22.4%	23.5%

From Table 3, the netizen populations are increasing significantly and reach 61 million people in 2012. The more the data show that the young people (15-35 age netizens) dominate as the user of the internet. The characteristic of these people are more openness to the new thing. They become the digital native.

The gadget is something that can not be separated from netizens. Based on Markplus Insight research, there are around 58 million of internet users in Indonesia through mobile internet access such as smart phones, personal notebooks, net books, and tablet PCs. Three of ten netizens also replace their gadget in last year. It can be predicted that the increase of mobile netizens will for the next year.

The netizen activities include not only searching and browsing, emailing, finding news, and chat but also social network interaction, downloading, uploading, and file sharing to each others. These activities is shown by Table 3.

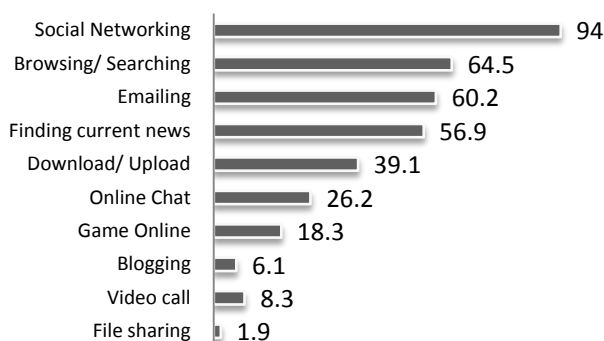


Figure 1. Netizen activities [7]

From all of previous data, there is an increase of use of wireless technologies especially mobile gadget roommates support learning. Mobile devices have higher penetration rate than other devices among the youth. This advantage gives possibility to serve mobile learning [8].

4. CONCLUSION

In this case, the higher IT literacy does not directly affect to the higher learning achievement. The possible reason is students do not use the internet to study or search the relevant learning material especially science. Implementation of the learning strategy that engage student to use computer and to search the material from the internet can be used.

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