Internet Access and Internet Self-efficacy of High School Students

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ABSTRACT
This study aimed at determining the availability of the internet facility, access, and internet usage in general as well as in learning physics among high school students in Lampung, Indonesia. The study also assessed students' internet self-efficacy and perception of the internet in learning physics. A number of 1883 students, which consists of 700 males and 1183 females, participated in this descriptive study. A questionnaire consisted of 30 items was implemented in this study. The results showed that most students have internet facilities and nearly all of them have internet access through mobile phones. The majority of students had used the internet for more than or equal to three years (78.1%). In using the internet, students have two main reasons, for academic purposes (90.3%) and for social media activities (89.5%). Majority of internet service used in physics was to solving homework (78.5%). The study also revealed that students' internet self-efficacy and perception for learning physics were in "high" and "positive" category, respectively. These results imply that the students' internet facilities, access, experience, and self-efficacy are categorized high. Therefore, the integration of internet in teaching physics at high school in Lampung is adequately potential.

Keywords: Internet access; Internet self-efficacy; Perception about internet; Physics learning

INTRODUCTION

In recent year, due to its explosive growth, the internet has become increasingly important for diverse needs of human's life (Wastiau, et al., 2013; Chou et al., 2009). The data of the internet user population worldwide by 31 March 2017 is 3,731,973,423, almost a half (49.6%) of the total population in the world. Moreover, in Indonesia, the population of internet users is 132,700,000, more than half (50.4%) of the total population in Indonesia (Miniwatts Marketing Group, 2017). The reasonable factors explaining this phenolmenon is that internet provides all needs of source such as information, education, communication, and entertainment, as mention in some literature (see e.g. Rhema & Miliszewska, 2014; Jadoon et al., 2011).

Furthermore, it has been introduced as a powerful tool and rich information sources for academic works (Jimoyiannis, 2010; Chou et al., 2009). Internet is also stated as multiple tools which enable students to communicate with others and share knowledge, experience, and culture (Limaye & Fotwengel, 2015). Consequently, the use of internet plays a crucial role in sustaining educational practice (Rhema

& Miliszewska, 2014).

Based on some studies, the efficiency and effectiveness of accessing material on the internet may become one of the reasons for internet usage trends among user (Limaye & Fotwengel, 2015; Jadoon et al., 2011; Tsai et al., 2011). Comparing to conventional environment learning, Internet-based learning (IBL) provides different learning experiences for learners, more cost-efficiently or positive outcome quality (Abdous & Yoshimura, 2010). The finding of studies suggests that sustaining learning process by technology can improve students' achievement, skill, positive attitude and also gain more knowledge within the process (John, 2015; Tsai et al., 2011).

In the other hand, a study of integrating YouTube video in teaching Chemistry by Blonder et al. (2013) found that the educators improve their skill, and even more creative in developing a unique Technological pedagogical and content knowledge (TPACK). Moreover, it is noted, by offering opportunities of innovation, communication channels, flexibility of time, and also social system, IBL suggests improving teachers' motivation in internet utilization in teaching-learning process (Uluyol & Şahin, 2016).

Besides, in order to get efficient implementation, there are several things to need under attention. A study in Pakistan found that instead of more than 80% students were able to use internet, the frequency of internet use and its usage in learning were still low due to the lack of training of students in comparison with other countries (Jadoon et al., 2011). In terms of its outcomes derived from IBL, several studies revealed that student's self-efficacy and students' perception toward the internet have had a positive role in learning outcome (Tsai et al., 2011; Tsai & Lin, 2004; Wu & Tsai, 2006). Further investigation reveals that hardware, software, learning material, and also documentation are all the needs in integrating ICT in teaching-learning process (Tondeur et al., 2012).

Regarding the internet-based learning term, computer belief play a significant role in technology acceptance (Wong et al., 2012). Research has proved that students' self-efficacy has an important role in students' attitudes, process, and outcomes (Tsai et al., 2011). These are in line with the work by Celik and Yesilyurt (2013) that ICT self- efficacy is important in computer-based learning. There is a positive relationship between students' IT self-efficacy and the use e-learning, computer skill, attitude, and also students' outcomes (Baturay, et al., 2017; Wu, Tennyson, & Hsia, 2010). In sum, self-efficacy is an important concept in the research of ICT and is usually used to represent the actual skill which is comparatively difficult to measure.

Due to the limitation research in Indonesia regarding inernet utilisation, this study was, therefore, aimed at determining the patterns of internet access and utilization among high school students undergoing physics learning. Furthermore, highlighting the importance of self-efficacy role in the learning process, the study also assessed the general internet self-efficacy of students and students' perception of internet usage in physics learning, in Indonesia.

METHOD

The survey study was carried out at 23 senior high schools in Lampung Province of Indonesia which a random sampling was implemented. The sample for each school was between 70 to 93 students from 23 schools. From a total of 23 schools, 10 schools were from the city of Bandar Lampung and Metro, and the rest were from remote areas. A number of 1883 participants in total, which were 700 male students and 1183 female students involved in this study. From the whole participants, 691 were first-year students, 727 were second-year students, and 465 were third-year students.

For the aim of the study, a Questionnaire used consisted of 30 items was prepared for a survey. It elicited information about students' demographic profile (3 items), internet facility both at school and at home (5 items), internet access, general utilization and in physics learning utilization (6 items), internet self-efficacy scale (10 items), and perception of internet in physics learning (6 items). This instrument was adapted the Internet Self-Efficacy Scale (ISES) developed by Tsai & Tsai (2003) and Wu & Tsai (2006) which modified the scale to a ten-item 5-point Likert-type scale ranging from 5 (very confident) to 1 (very unconfident). All of these items measured general Internet self-efficacy (GISE) which is related to a respondents' confidence about their basic skills in operating Internet function.

Pearson correlation was used to measure

the validity, and the result was valid for its entire item. Test of reliability of scale has been conducted by measuring Cronbach alpha. With the coefficient of .857, the questionnaire was considered reliable as they surpassed the minimal consistency guidelines (> .60). The validity of the perception scale was also valid for all items. Test of reliability of perception scale has also been conducted by measuring Cronbach alpha. Since the Cronbach alpha coefficient was .667, then the questionnaire was also considered reliable.

RESULT AND DISCUSSION

Result

In term of socio-demographic, a number of 1883 senior high-school students from different grade were selected as participants. The majority participant in this study was female (1183 students) which was taking 62.8% while 700 students (37.2%) of all were males. The students were from grade X (36.7%), grade XI (38.6%), and grade XII (24.7%).

Table 1. Students' Internet Facility

No	Item	n	%
1	Availability of internet devices		
	-Yes	1309	69,5
	-No	574	30,5
2	Internet connection at home		
	-Yes	855	45,4
	-No	1028	54,6
3	Internet connection through smartphones		
	-Yes	1766	93,8
	-No	117	6,2
4	Internet connection at school		
	-Sufficient	787	41,8
	-Not sufficient	1051	55,8
	-None	45	2,4
5	Wifi at school		
	-Yes, with good speed	554	29,4
	-Yes, with bad speed	1213	64,4
	-None	116	6,2

Due to investigating the students' internet self-efficacy, the present study had also analyzed students' internet facility at home and school. Based on Table 1, nearly 70% of students stated that they had their own computer or laptop at home where only 45.4% have internet connection. A large number of students (93.8%) stated they have internet connection

through smartphone/mobile phones. The students reported that even their school had internet service but it was not sufficient for all of the students. Normally, the number of computer with internet connection at a particular school is much less than the number of their students. The availability of wifi at schools in Lampung is also growing, more than 90% of students stated their schools have wifi, but the speed is still lacking.

The result related to the experience of students' internet use is shown in Table 2. Most participants had used internet for more than or equal to 3 years (78.3%) and less than 5% of them assessed internet less than a year. At the same table with students' experience of the internet use, results of study about the frequency of internet use depict that almost three-fourth (74.1%) students used internet every day, 15% of them used internet 3-4 times/week, 5.4% for once a week, and the rest only about 5% of students use internet 2-3 times per month or less. This initial finding is relevant to a study conducted by Ayub et al. (2014) which also found that students internet access time are different based on level and field of study. Loan (2011) who conducted a comparative study of internet used by rural and urban college students found that as compared from daily to weekly 84.70 % of urban students were frequent users of internet than rural students (73.95%).

Table 2. Experience and frequency of Internet Use

No	Item	n	%
1	Experience of Internet Use		
	> 5 years	795	42,2
	4-5 years	358	19
	3-4 years	322	17,1
	2-3 years	205	10,9
	1-2 years	119	6,3
	< 1 year	84	4,5
2	Frequency of Internet Use		
	Daily	1395	74,1
	3-4 times/week	288	15,3
	Once a week	102	5,4
	2-3 times/month	58	3,1
	Once a month	23	1,2
	Never	17	0,9

Moreover, the variation of accessing the internet was also examined in this study. The data discloses that using internet at home was

identified as the preferred place by students (85.1%) for both social and academic supporting service, followed by school (64.4%), and commercial cyber cafes (42.1%). It is generally speaking that Indonesian students mostly used internet at home. The same argument is also reported by Jadoon et al. (2011) who found 70.5% of students' preferred using internet at home. This finding is also relevant to Zhao et al. (2010) who stated that home and cafe are considered as the main location for students to use the internet. In other hands, Loan (2011) found that the majority of urban students used internet at commercial cybercafés while rural students mainly used internet at home.

Table 3. Purpose of Students' Internet Use

No	Purpose of internet use by students	n	%
1	Academic	1700	90,3
2	Social Media	1685	89,5
3	Online Shopping	518	27,5
4	Email	565	30
5	Chatting	1077	57,2
6	Online Reading	426	22,6
7	Entertainment	1288	68,4
8	Downloading	938	49,8
9	E-learning	298	15,8
10	General information	1254	66,6
11	Other	30	0.6

In using the internet, people have various reasons to use the internet (Table 3). For example, the present study noted that students used internet more for academic purposes (90.3%) and social media activities (89.5%) followed by entertainment (68.4%), getting general information (66.6%), and chatting (57.2%), as top 5 activities. The result also revealed that there is 15.8 % of students (298 students) who used internet to join e-learning. The reason might be that there is not enough information about what and how to join it.

Table 4. Internet Use in Physics Learning

No	Internet service used by students in Physics	n	%
1	Browsing of physics material	1228	65,2
2	Searching of physics video	375	19,9
3	Searching of physics animation	330	17,5
4	Doing homework	1478	78,5
5	Joining e-learning/online learning	171	9,1
6	Engage in discussion group	284	15,1
7	Searching of physics exercises	981	52,1
8	Doing exercises	424	22,5
9	Other	23	1,2

Internet service used by students in Physics was also examined in the present study. Based on the data showed in Table 4, the students used internet in order to solve their problem in doing homework. It was found as the most reason of using internet (78.5 %). They also used internet for browsing of Physics material (65.2%), searching Physics exercises (52.1%), doing Physics exercises (22.5%), searching of Physics animation (17.5%), and engage in discussion groups (15.1%). Deb (2011) also noted that students' internet use related to their studies. This fact of internet used by students for various reasons may also be related to internet use as a powerful tool and rich information sources for academic works (Chou et al., 2009).

Despite all the advantages above, internet also leaves some barriers. Since Indonesia is a developing country, the speed of internet connection still lacks to support students' internet utilization. The present study provides a preliminary evaluation of problems faced by students in using internet. As it is shown in Table 5, the poor internet connection was found as the most common problem faced by students in using internet (85.8%). Furthermore, the expensive cost that students must be paid for internet access was also identified as barriers (28.6%). As stated by Zhao et al. (2010), in some developing countries, insufficient facilities at school or unaffordable expenses for internet access at home are problems faced by students in using internet. Moreover, the students also need to have the skill to analyze and choose data due to a large amount of data on internet (22.7%).

Table 5. Barriers to Accessing the Internet

No	Item	n	%
1	Poor internet connection	1616	85,8
2	Hard to find information	606	32,2
3	Too much information	427	22,7
4	Lack of time to used	117	6,2
5	High cost	539	28,6
6	Other	43	2,3

Table 6. Internet Self-efficacy

No	Question	mean	SD
1	I know how to search the web?	4,28	0,76
2	I am able to look for information in the website?	3,97	0,82
3	I can use web browser like Mozilla Firefox to search for information	4,08	0,85
4	I believe that I am a good user of the internet	4,11	0,82
5	I believe I can access more than one site at the same time	4,12	0,84
6	I believe I can enter URL site directly to open web	3,89	0,93
7	I believe I can make bookmark for important web	3,26	1,04
8	I believe I can print out important information from web	3,85	0,98
9	I believe I can download file from internet	4,09	0,89
10	I believe I can copy texts from web to Microsoft Word	4,38	0,83
	Average	4,00	0,88

Related to the use of internet, students' attitude and self-efficacy toward the internet have an important effect on their motivation and interest of learning using internet (Agyei & Voogt, 2011). By means of the influences, the present study also explores senior high school students' internet attitudes and internet self-efficacy generally. This study reveals that students' internet self-efficacy and perception about internet were high and positive. According to the results presented in Table 6 and Table 7, the average of ISE was 4.00 which mean students have high ISE, and 3.71 of internet perception means that students have a positive perception of internet for learning Physics.

Table 7. Perception about the Internet Usage in Physics Learning

No	Item	mean	SD
1	Internet helps me to find physics materials	4,29	0,69
2	Internet helps me to solve my homework	3,91	0,81
3	Internet helps me to	3,64	0,92
	prepare my examination		
4	I want to access internet to find Physics materials but I do not know how to find it	2,54	1,09
5	Internet make me easier to learn	3,66	0,89
6	Using internet makes me confuse than helping me in understanding Physics	2,69	1,05
	Average	3,71	0,91

Discussion

Most students have their own computer/laptop at home, but less than half of them have an internet connection through their computer/laptop. A larger number of students have internet connection through smart-phone/mobile phones. Moreover, most of the participants had used internet for 3 years or more (78.3 %), and almost three-fourth (74.1%) accessed internet every day. This finding is relevant to the previous study conducted by Ayub et al. (2014) which also found that students internet access time are different based on level and field of study. Loan (2011) who conducted a comparative study of internet used by rural and urban college students found that as compared from daily to weekly 84.70 % of urban students were frequent users of internet than rural students (73.95%). Based on the results, the students used internet in order to solve their problem in doing homework. It was found as the most reason for using the internet (78.5 %). This finding in line with the previous finding (Deb, 2011) which also noted that students tend to use internet related to their studies as well as social networking. This fact of internet used by students for various reasons may also be related to internet use as a powerful tool and rich information sources for academic works (Chou et al., 2009).

This study reveals that students' internet self-efficacy and perception about internet were high and positive. This finding is in line with previous research which found that learners showed a positive attitude and adequate self-efficacy of internet use (Baturay et al., 2017; John, 2015; Agyei & Voogt, 2011; Tsai et al., 2011). Zhao et al. also reported that even though students have shown a positive attitude, the technical support and training are also needed in order to guide students' usage (Zhao et al., 2010). ICT self-efficacy is also noted that plays

an important role in students' computer skill and information literacies (Hatlevik et al., 2018).

CONCLUSION AND SUGGESTIONS

Based on the result and discussion above, it can be concluded that most students have internet facilities such as computer or laptop and nearly all of them have internet access through mobile phones. For experience in using the internet, most students in Lampung had used internet for more than or equal to 3 years (78.1%). High school students participated in this study have three most reasons in accessing the internet: for academic purposes (90.3%), for social media activities (89.5%), and for entertainment (68.4%). In physics subject, the majority of students used internet access to help them solving their homework (78.5%). However, the most common barriers faced by the students in accessing internet is the issue of internet connection speed. This was also found in another developing country. The study also revealed that students' general internet self-efficacy was in high category (4.0 out of 5) and students' perception about internet for learning physics was also positive (3.71 out of 5). The finding is useful to in facilitating scholars and stakeholders of potential to integrate the use of internet in physics teaching practice at senior high school in Lampung.

By using the questions in the survey, researchers are trying to get a better understanding of the patterns of internet access and utilization among high school students undergoing physics learning. In short, the results of the study provide new knowledge and add literature on internet usage in Physics learning process. The study also assessed the general internet self-efficacy of students and students' perception of internet usage in physics learning. It also suggests a practical important finding as helping the stakeholders and government understand the potential of internet-based learning and adjust properly policies considering the findings.

In its limitation, gender differences, as well as differences in students' demographic and grade have not been explored whereas quite many studies reported it in this current study. Wong et al. (2012) reported that gender significantly affects ICT acceptance of individuals.In contrast, Chou *et al.* have conducted a study to Taiwanese elementary school students' attitude toward the internet which noted that there is no significant difference found between males and females in terms of attitudes (Chou et al., 2009). The finding is in line with the work by Baturay et al. (2017). It suggests that there is no significant gender difference impact on the internet use. Therefore, further study would be conducted to explore students' gender differences in internet self-efficacy and students' perception about internet for learning physics.

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