

## THE USE OF ICT AMONG UNIVERSITY'S LECTURERS IN MEDAN, INDONESIA: A COMPARATIVE STUDY

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### ABSTRACT

This study is to discover the difference use of ICT between faculty members in Medan, Indonesia with regards to their demographic factors namely: gender, age, teaching experiences, educational level, and department of origin. A total of 260 samples were taken from the overall populations, where a survey was conducted among the academicians from three largest private universities. After the cross-tabulation statistical analysis was completed, the findings are promising. The gender, age and department of origin of university's lecturers are proven to have a significant use of ICT. In contrast, after many years of teaching experiences and with their educational level, it is found that it did not have any influence towards the utilization of the technology in their learning process. Thus, there are similar patterns of usage that were also found among them.

**Keywords:** ICT usage, lecturer, demographic factor, university, Medan.

### INTRODUCTION

The ICT integration is a crucial to assisting sustainability of an education system. The application of this advanced technology is able to providing a successful of teaching and learning process in the universities. Moreover, ICT is competent to enlarge traditional teaching and learning activities (Herath & Hewagamage, 2015). Besides computer and all the necessary software, ICT also comprises a network technology namely the Internet (Celebic & Rendulic, 2011). Communication process, information management, and information storage are the number of activities which can assist by ICT (Ansah, 2013). Additionally, in accomplishing the successful of ICT integration in higher education, institutions need to conduct a discipline for various user groups (i.e. students, lecturers, administrators, etc.) (Omotsho, Lateef, Amusa, & Bello, 2015). Also, lecturers are considered as the fundamental factor to influence the students' academic performances (Muzenda, 2013).

However, the development of ICT still not been given greater concern by the lecturers in some universities in Indonesia (Perbawaningsih, 2013). Medan, in particular, which is the largest city outside Java, has a low Internet penetration compared to other provinces in Sumatera with a percentage of 25% (APJII, 2015). Thus, it is very important to discover the factors that influencing the utilization of ICT among lecturers in Medan, Indonesia.

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Several studies have been conducted concerning to ICT usage and lecturers' demographic factors. By viewing the gender, the utilization of ICT has not significantly been affected (Alazam et al., 2012; Ansah, 2013; Nwankwoala, 2015; Kpolovie & Awusaku, 2016), whereas the different age of lecturer has an impact towards the ICT usage (Herath & Hewagamage, 2015; Mumcu & Usluel, 2010). Furthermore, Onwuagboke et al. (2014) and Kpolovie & Awusaku (2016) reported that there is a significant relationship between the ICT usage and teaching experiences among lecturers. The differences usage was found based on the lecturer experience.

Lecturers' educational level factor also gives effect to the ICT usage (Mumcu & Usluel, 2010). Lastly, the different department in a university is not a factor that influencing the ICT adoption (Kpolovie & Awusaku, 2016). Similarly, Herath & Hewagamage (2015) reported that there is no significant difference of ICT usage among educators' departments origin.

The article tries to scrutinize the distinction of ICT usage among lecturers regarding to their gender, age, teaching experiences, educational level, and department origin. Specifically, the study was designed to answer the following questions:

1. Is there any difference in using ICT based on lecturers' gender?
2. Is there any difference in using ICT based on lecturers' age?
3. Is there any difference in using ICT based on lecturers' teaching experiences?
4. Is there any difference in using ICT based on lecturers' educational level?
5. Is there any difference in using ICT based on lecturers' department origin?

## LITERATURE REVIEW

Information and Communication Technology (ICT) has influenced many facets in human daily live including enterprises, business, tourism, medicine, engineering and others (Gebremedhin & Fenta, 2015). Besides, education is one of aspects touched with the development of this technology (UNESCO, 2002). Education act as the major key to the human development (Alazam et al., 2012) and securing the sustainability of economic development (Ozturk, 2001). Among previous researchers, ICT was a profound element to increasing the quality of education (e.g., learning process) (Hue & Ab Jalil, 2013; Alassaf, 2014; Gebremedhin & Fenta, 2015; Rabah, 2015).

### The Uses and Gratification Theory

The Uses and Gratification Theory (UGT) illustrated the media consumption by user started with the description of frequency use (LaRose, Mastro, & Eastin, 2001). The theory usually used for communication studies (LaRose, Mastro, & Eastin, 2001) which is explaining the magnetism of certain media towards the user (Cummings, 2008). The UGT firstly emerged by Jay Blumler and Elihu Katz in 1974 (Cummings, 2008) and essentially stressed on how media is consumed and what is the gratification it creates for the consumer (Yuan, 2011). Through the UGT, Lim (2011) stated that the demographic of user is one of the factors that influencing the media consumption, including: gender, age, education, country origin, and others.

### ICT Usage

In this study, ICT usage is measured for its intensity, whereas ICT is applied at all stages of the innovative teaching and learning activities. The intensity is related to the frequency or how often the activities are performed repeated and continuously from user (Ariani, 2011). Hence, this study determined the intensity as the frequency of ICT performed by respondents during their learning process.

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### **Lecturers' Gender and ICT Usage**

Gender is the distinguishing between, male and female. In 2014, a survey conducted by APJII reveals that female is the majority of Internet user in Indonesia with 51% of percentage whereas the male is only at 49% (APJII, 2015). The circumstance indicates that a non-similarity of ICT usage in the realm of gender. Gender differences and ICT usage have been reported in several studies, and yet some studies have shown that gender has no relationship to the ICT adoption in education. In study carried out by Kpolovie & Awusaku (2016) in Nigeria, the employment of ICT technology is not reckoning with gender. Overall, there is no significant difference was established between male and female and use of ICT.

Additionally, Ansah (2013) reported a research in Africa that reveals an insignificant relationship between gender and actual use of ICT. However, according to Alazam et al., (2012), gender is not affecting the use of ICT. Also, Nwankwoala (2015) confirmed that gender has no relationship on lecturer ICT use, this indicates that there is no different between male and female on utilization of ICT.

### **Lecturers' Age and ICT Usage**

Through the survey by APJII in 2014, almost half of Internet user in Indonesia is the young people aged 18-25 years old (APJII, 2015). The percentage of 49% from entire samples is representing that young age respondents are used ICT most rather than old age community. A research conducted by (Mumcu & Usluel, 2010) identified that there is a significant difference between the age of educators and ICT usage. Similarly, Herath & Hewagamage (2015) agreed that ICT usage among lecturers in universities have a different in age categories.

### **Lecturers' Teaching Experiences and ICT Usage**

According to Stes (2008), lecturer is divided into three levels regarding to their teaching experience, namely: little experience/fresh ( $\leq 5$  years), medium experience ( $> 5$  but  $\leq 10$  years), and high experience/old ( $> 10$  years). In this research, lecturers' years of experience refer to the number of years they spent in universities for teaching. Refers to study conducted by Onwuagboke et al. (2014), educators' teaching experiences was influencing the Internet use. The outcome study shows reveals that the less experienced lecturers are more frequently used the Internet. In the same way, Kpolovie & Awusaku (2016) also mentioned that ICT usage is influenced by educators' teaching experiences. However, Herath & Hewagamage (2015) stated that teaching experiences is not significantly affecting the ICT usage. The result pointed out that the different teaching experience is not in line with the utilization of ICT.

### **Lecturers' Educational Level and ICT Usage**

In the educational sector, lecturer is divided into two levels, which are Master level and doctoral level (PhD). Mumcu & Usluel (2010) confirmed that there is a significant difference between educational level and teachers' using ICT. The higher educational level of lecturer is more frequently to utilize ICT.

### **Lecturers' Department Origin and ICT Usage**

Kpolovie & Awusaku (2016) agreed that the use of ICT is not regarded to lecturer's area of specialization. In the same way, Herath & Hewagamage (2015) also found that the individual departments are having no differences in ICT utilization. In short, there is no significant relationship between lecturers' department origin and the use of ICT.

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## RESEARCH METHODOLOGY

The study is a descriptive survey which is aimed at finding out how lecturers in the universities in Medan, Indonesia use the ICT in their daily teaching activities.

### Research Framework

A research framework was designed as a guideline in evaluating the proven hypothesis to answer the research questions. As in Fig. 1, the research framework explained the demographic factors influencing the ICT use.

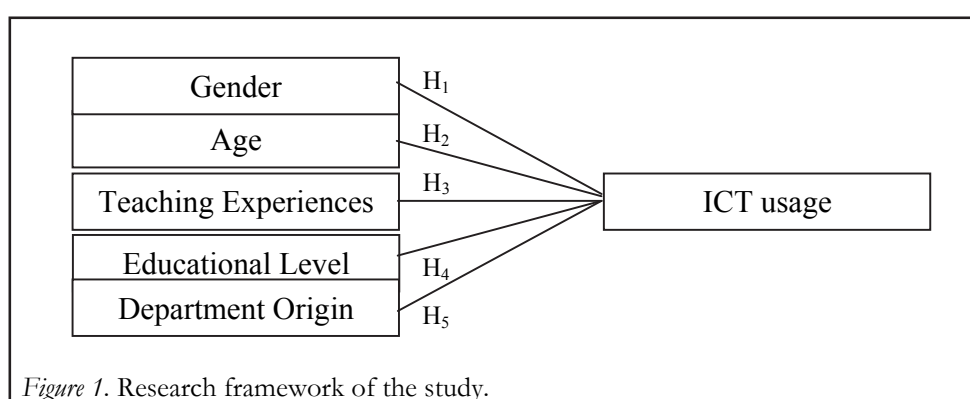


Figure 1. Research framework of the study.

According to Fig. 1, the obtained five hypotheses, namely:

1. H<sub>1</sub> = Lecturers' gender has no difference in ICT usage.
2. H<sub>2</sub> = Lecturers' age has a difference in ICT usage.
3. H<sub>3</sub> = Lecturers' teaching experience has a difference in ICT usage.
4. H<sub>4</sub> = Lecturers' educational level has a difference in ICT usage.
5. H<sub>5</sub> = Lecturers' department origin has no difference in ICT usage.

### Population of the Study

Hong & Songan (2011) stated that the private higher education institutions play a crucial role in the higher education systems in Indonesia. Then, Medan has as much as 180 universities which are the number of private universities (98.33%; N=177) is much greater than the number of public university (1.67%; N=3). Thus, the study is stressed only for the private universities.

Considering to the pragmatic purposes of cost, efficiency, greater speed and flexibility (Zikmund et al., 2009), this study will determine the largest private universities and largest number of students, namely: Universitas Muhammadiyah Sumatera Utara (UMSU), Universitas Pembangunan Panca Budi (UPPB), and Universitas Medan Area (UMA). The total of population is 787 lecturers, which is the accumulation from the three universities: UMSU as much as 368, UPPB with total 208 educators, and UMA as much as 211 lecturers.

### Sample of the Study

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With regards to the guidelines by Sekaran (2003) the population size of this study which is 733 lecturers, the representative sample size must be between 254 and 260. Hence, this study drew 260 total samples. Next, sampling technique will be carried out by using stratified random sample. Stratified random samples are taken from each private university. To determine the value of the sample size from each university, will be use this equation (Kim & Shao, 2013):

$$n_i = n \frac{N_i}{N}$$

Where:  $n_i$  = sample size for each university

$n$  = total sample

$N_i$  = population size for each university

$N$  = total population

Then, total samples for each university are:

1. UMSU:  $260 \left( \frac{339}{733} \right) = 120$
2. UPPB:  $260 \left( \frac{183}{733} \right) = 65$
3. UMA:  $260 \left( \frac{211}{733} \right) = 75$

### Instrument for Data Collection

The instrument of the study was adopted from several previous researches which are combined between several indicators in teaching and learning, that determine quality of learning process by Koorts (2005) and items of ICT usage from Gülbahar & Guven (2008). There are eleven items that are asking the questions regarding intensity of ICT usage. The participants will response according to the Likert scale which is from the scale 1 to scale 5, with response options as follows: Never, Rarely, Occasionally, Regularly, and Always.

### Reliability and Validity of the Instrument

The instrument in this study is test for its reliability by measuring the Cronbach's alpha ( $\alpha$ ). Then, to ensure the validity, the instrument uses the coefficient correlation to measure the relationship between value of each items and mean value of total item. Then again, after organizing a pilot study which is participating 30 respondents to ensure reliability and validity of the instrument, it was obtained the Cronbach's alpha ( $\alpha$ ) score as much as 0.920. In other words, the instrument was classified in a very good reliability (Hair et al., 2010). Moreover, the validity has been found that all of the items have value of  $r$  approaching to 1.0 which means there are positive relationship between value of each items and mean value of total item (Lubis & Osman, 2015).

## RESULTS AND FINDINGS

### Overview of Data Gathered

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The responses rate of the respondents is 100% with total 260 samples. Table 1 illustrated the demographic factors of respondents. For the gender factor, the majority of respondents are male (56.5%), whereas female is 43.5%. Then, in age of the participants is classified into five groups, in which 12.3% are in between 21-30 years, 34.2% of those are in between 31-40 years, 31.5% are in between 41-50 years, 18.8% are in between 51-60 years, and the smallest category is over 60 years old with percentage rate 3.1%. To conclude, the majority of the respondents were between the ages of 31 and 40 years.

In teaching experience factor, high experience/old educators (> 10 years) are prevalent in the survey with total 46.5%. Next, followed by little experience/fresh lecturers ( $\leq$  5 years) with total 32.3%, and medium experience (5-10 years) as much 21.2%. In terms of educational level, 87.7% from total respondents hold a Master degree, and only 12.3% hold a PhD. Through this survey, there are 24.6% specialized in economy department, and then followed by 15.8% were listed in engineering faculty.

The next followed is law department has as much as 12.7%, 11.5% respondents were listed in agriculture, then social and political 10.8%. Next, 8.1% were listed in education department and psychology as much as 5.4%. Other department involved the medical, biology, and Islamic religion department as much as 11.2%.

**Table 1: Demographic of the Respondents**

No.	Variables	Category	Frequency	Percentage (%)
1.	Gender	Male	147	56.5
		Female	113	43.5
2.	Age	20-30	32	12.3
		31-40	89	34.2
		41-50	82	31.5
		51-60	49	18.8
		> 60	8	3.1
3.	Teaching experiences	< 5 years	84	32.3
		5-10 years	55	21.2
		> 10 years	121	46.5
4.	Education level	Master	228	87.7
		PhD	32	12.3
5.	Department origin	Agriculture	30	11.5
		Psychology	14	5.4
		Engineering	41	15.8
		Social	28	10.8
		Law	33	12.7
		Economy	64	24.6
		Education	21	8.1
Other	29	11.2		

### Data Analysis

This study employed the statistical analysis named Cross-tabulation through Chi-Square test to illustrate the relationship between variables in a simple way (Lubis & Osman, 2015). The overall result of the study is presented in Table 2.

**Table 2: Resume of the Result**

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No.	Variables	Chi-Square test			Asymp. Sig. (2-sided)
			Value	df	
1.	Gender	Pearson Chi-Square	49.069 <sup>a</sup>	39	.130
		Likelihood Ratio	58.834	39	.022
		Linear-by-Linear Association	.988	1	.320
		N of Valid Cases	260		
2.	Age	Pearson Chi-Square	2.404E2 <sup>a</sup>	156	.000
		Likelihood Ratio	167.221	156	.255
		Linear-by-Linear Association	26.473	1	.000
		N of Valid Cases	260		
3.	Teaching experiences	Pearson Chi-Square	84.414 <sup>a</sup>	78	.290
		Likelihood Ratio	99.190	78	.053
		Linear-by-Linear Association	9.064	1	.003
		N of Valid Cases	260		
4.	Education level	Pearson Chi-Square	31.438 <sup>a</sup>	39	.800
		Likelihood Ratio	38.812	39	.478
		Linear-by-Linear Association	1.900	1	.168
		N of Valid Cases	260		
5.	Department origin	Pearson Chi-Square	2.957E2 <sup>a</sup>	273	.165
		Likelihood Ratio	275.330	273	.449
		Linear-by-Linear Association	1.671	1	.196
		N of Valid Cases	260		

### Gender factor

Table 2 shows that the significance value as much as 0.130, then by following the level of sig. 0.05 alpha as the cut-off value of significant value (Saunders, Lewis, & Thornhill, 2012). A surprising outcome is revealed that female and male lecturers have the distinction in ICT adoption in learning process. Hence, the result rejects the hypothesis and fulfills the answer that the lecturers' gender has the difference in ICT usage.

### Age factor

According to Table 2, the significance value for age factor is 0.000. It is apparent that the value is less than the alpha value, and for that reason, the hypothesis 2 is still retained. Otherwise, different age of lecturers is indicating a different use of ICT. Then, it can be concluded that age of lecturers make a dissimilarity of the ICT utilization.

### Teaching experiences factor

The teaching experiences of educator were proven that has no difference in using ICT by the determination of significance value in Table 2. The value at 0.290 is higher than the alpha value. Again, a baffle result is confirmed the lecturers in different teaching experiences are having a similarity in ICT usage. Thus it is breaking down the hypothesis and sum up that there is no difference in using ICT based on lecturers' teaching experiences.

### Education level

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In the same way, participants' education level was found has no difference in the utilization of ICT in the survey. Table 2 shows that the significance value of educational level is 0.800 and indicates that the number is higher than 0.05. Therefore, hypothesis 4 is rejected, and yet there is no difference of ICT usage regarding to the lecturers' education level. Lecturers who held Master level is similar to the PhD level.

### Department origin

Based on hypothesis 5, department origin is confirmed that impacting the ICT usage. Lecturers from different department are having similarities in the application of ICT in higher education. However, in Table 2 the significance value is expressing the counteraction. The value of 0.165 indicates a higher number than the alpha value (0.05). Thus, it can be concluded that lecturers' department origin has a difference in ICT usage.

## CONCLUSION

This study analyzed the difference of lecturers' demographic factor and ICT usage for their learning process. According to the findings, only one hypothesis is still defended that is the lecturers' age has a difference in ICT usage (H<sub>2</sub>). On the other hand, the other hypotheses are rejected. Table 3 shows the resume of the entire hypotheses which are proposed in the study.

**Table 3: Summary of Hypotheses**

No.	Hypotheses	Statement of hypothesis	Remarks
1.	H <sub>1</sub>	Lecturers' gender has no difference in ICT usage.	Rejected
2.	H <sub>2</sub>	Lecturers' age has a difference in ICT usage.	Accepted
3.	H <sub>3</sub>	Lecturers' teaching experience has a difference in ICT usage.	Rejected
4.	H <sub>4</sub>	Lecturers' educational level has a difference in ICT usage.	Rejected
5.	H <sub>5</sub>	Lecturers' department origin has no difference in ICT usage.	Rejected

Lecturers' gender which is profound to be confirmed that was not influencing the ICT usage (Alazam, Bakar, Hamzah, & Asmiran, 2012) (Ansah, 2013) (Nwankwoala, 2015) (Ansah, 2013) (Kpolovie & Awusaku, 2016). However, the study reveals that gender is a factor that affects the ICT usage. Female and Male educators have the difference in the utilization of ICT. Then, by regards of the teaching experience, researcher (Onwuagboke, Singh, Fook, & Onwuagboke, 2014) and (Kpolovie & Awusaku, 2016) stated that a different years of teaching experience is influence the adoption of ICT in education. On the contrary, the results concluded that is no different use among lecturers.

Furthermore, Mumcu & Usluel (2010) identified the educational level is a one of the factor that makes a different use of ICT. Conversely, the study determines a contrast outcome. The result highlights a similar use of ICT among lecturers dispute their educational level. Then, Kpolovie & Awusaku (2016) and Herath & Hewagamage (2015) stated that the department origin of lecturers was not influencing the ICT utilization. However, the finding reveals that a distinguish use of ICT among lecturers in different department.

Beyond to other hypotheses, hypothesis 2 is accepted and retained. The result of the study is standing with the past researcher (Mumcu & Usluel, 2010) (Herath & Hewagamage, 2015). Thus, it can be concluded that the different age of lecturers have a different use of ICT. To sum up, in Medan, Indonesia, the different use of ICT by lecturers for their learning process in higher education is influenced by several factors. The demographic factors are gender, age, and department origin.

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