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ICT Utilization in Teacher's Training Institutions: Comparison of Two Cases in Indonesia

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Abstracts

Indonesia has just launched a program called Hybrid Learning for Indonesia Teachers or HYLITE program. HYLITE is an in-service teachers training program, especially for elementary school teachers in Indonesia, designed to improve teacher's qualification from Diploma II to Strata 1 (S1 – is equivalent to a bachelor degree). The program is conducted via open and distance learning mode and employing hybrid learning approach, i.e.: the combination of face-to-face residential meeting, online learning and independent learning utilizing print and other media. The program is offered by a consortium of 23 universities. Beside the HYLITE program, there are other programs for the improvement of elementary teacher qualification.

This paper will describe the comparison of two institutions in terms of information and communication technologies (ICT) utilization by faculty in the elementary teacher education program offered through HYLITE system and face-to-face system. The purpose of the study is to identify factors, which can facilitate teachers' use of ICT. Those factors can be utilized to develop programs to enable the students and faculty to use ICT appropriately in the teaching and learning activities.

Introduction

Improvement of teachers' qualification to Strata-1 (S1, equal to Bachelor's Degree) has been the priority program of the government of Indonesia (GOI), according to Teachers and Lecturers Law (No. 14/2005). Currently, the numbers of teachers in Indonesia who do not have the S1 degree are about 1,780,000. To respond to the Teachers and Lecturers Law, and to expand the capacity of 278 private and state teachers' colleges, the GOI has assigned the Directorate General of Higher Education (DGHE) and Directorate General of Quality Improvement for Teachers (DGQIT), to establish a consortium of 23 states and private teachers colleges, to work collaboratively to offer in-service teachers training program. The consortium, together with Universitas Terbuka, will improve the elementary school teachers' qualification from DII to S1 via open and distance learning system. The improvement program is named Hybrid Learning for Indonesian Teachers or HYLITE.

The teachers colleges of the HYLITE consortium consist of 18 state institutions and 5 private universities, from all of the main islands of the Indonesian archipelago. The HYLITE program is intended for in-service elementary school teachers who do not possess the minimal qualification of S1 yet. In-service teachers are teachers who are currently employed as teachers in elementary schools and reside in the surrounding areas of the teachers colleges. Those teachers who already have the DII in elementary education or graduate from are eligible for the HYLITE program.

The HYLITE program employs one curriculum for the 23 consortium members, with the load of 82-credit semester. Those credits include the professional and physical education courses. The HYLITE program utilizes the hybrid-learning model, which is the combination of print, audio-visual, web-based materials and the residential as

well as online tutorials. The HYLITE program is supported by the information and communication technology infrastructure owned by each of the consortium member institution.

The residential program is conducted for one month at the beginning of each semester. During the residential period, the students will be engaged in various tutorial activities, including laboratory works, and sit in the examination for the previous semester. After the residential program, the students will go home and study independently using the available learning resources. The web-based courses and facilitation of the learning process are accessible through the ICT centres and any internet café. The facilitation of students' learning process is provided through the online interaction utilizing five online interaction within five months of the semester, and or synchronous interaction in the form of teleconference once every semester.

The consortium follows operational guidelines as the basis of the implementation of the HYLITE program. Those guidelines are: a) Academic Action Plan, which is the design elaboration of the HYLITE program in each member of the consortium; b) the introductory courses to prepare students to study in the open and distance learning system; c) self learning materials development guidelines for print, audiovisual and web-based learning materials; d) operational guidelines for management of the program, including tutorials, practices and practicum, and teaching practice; and e) 32 packages of the hybrid courses.

As the regional centre of SEAMEO specializing in the capacity building in the area of ICT-based open and distance learning (ODL), SEAMOLEC facilitates the development of the capability of the 23 members of the consortium to implement the HYLITE program. In collaboration with the DGHE and DGQIT, SEAMOLEC assist the 23 institutions to design and implement the HYLITE program.

SEAMOLEC also facilitates the development of the technical requirement system for the program, based on the guidelines mentioned before. Furthermore, together with DGHE and DGQIT, SEAMOLEC monitors and evaluates the implementation of the program on periodical basis.

The HYLITE progam attracts the attention of the USINTEC, the United States-Indonesia Teacher Education Consortium, to cooperate in assessing the ICT infrastructures and utilization in the institutions offering PGSD program, either in face-to-face or distance learning mode such as the HYLITE program. This paper describes the comparison of ICT infrastructure readiness and utilization by the faculty and student teachers in two institutions offering PGSD program. Those institutions are a) Universitas Negeri Medan (UNIMED – State University of Medan in North Sumatera Island), which offers the PGSD program through the face-to-face mode; and b) Universitas Negeri Gorontalo (UNG – State University of Gorontalo at Sulawesi Island), which offers the HYLITE program.

Information and Communication Technology Readiness

In this paper, information and communication technology (ICT) readiness means the availability of ICT infrastructure, hardware, and software. It also means the availability of access and bandwidth for easiness of online communication.

The Government of Indonesia, through The Ministry of National Education' Strategic Plan, stated that ICT literacy rate among lecturers and students in higher education by 2009 is expected to achieve 80% and 50% respectively. ICT literacy includes proficiency in the utilization of computer and related programs.

Teacher education institutions should also reform their curricula by integrating ICT into teacher education programs to increase ICT competencies. (Brodjonegoro, 2006)

To overcome the problem of restricted bandwidth and high cost internet access, and to ensure the achievement of the strategic plan in ICT literacy among lecturers and students, the Ministry of National Education has cooperated with the Indonesian Telecommunication Company (Telkom) to offer The Indonesia National Education ICT-Network or Jejaring Pendidikan Nasional (JARDIKNAS) programs for school communities since 2005. The program offers collaboration, resource sharing, problem solving, and technical support in term of ICT infrastructure utilization (Nandika, Priowirjanto & Soekartawi, 2007). Furthermore, since 2004, the GOI has established ICT Centres in the cities which have active wide area network system. The ICT centres are supposed to provide training in ICT utilization for teachers of formal and informal education systems. In fact, ICT has been utilized in schools, even though in relatively small numbers. More and more internet kiosks, not only in the post office of capital cities in the provinces, but also in the districts are available. The community has also participated in the establishment of internet kiosk. The number of schools using the internet is also increasing.

For tertiary education, the GOI, through the DGHE, has established ICT program, which is named the Indonesian Higher Education Network or INHERENT Program since 2006. The inherent program has successfully connected 87 higher education institutions all over Indonesia, by providing about US $ 210, 000, - grant for each institution to improve the ICT infrastructure to meet the INHERENT standard. State University of Medan and State University of Gorontalo, both, have received the INHERENT grant and have established the ICT infrastructure

Information and Communication Technology Utilization

In this paper, ICT utilization means the utilization of ICT for word and data processing, presentation, email and internet browsing by the lecturers for teaching. This paper describe the study on the lecturers utilization of ICT for teaching and learning purposes, such as utilizing computer programs such as Microsoft word, spreadsheet, PowerPoint, email and internet. The study does not go into such detail as finding out the detail of ICT utilization such as for production purposes or classroom management.

The utilization of ICT in the teaching and learning in Indonesia has been established since 1999. The Directorate of Technical and Vocational Education (DTVE), has initiated the policy of ICT-based curriculum for technical and vocational schools. The policy ensures that ICT is treated as compulsory subject across all skills competency programs in the technical and vocational school system. The ICT related subjects taught are basic knowledge about computer and web design. Study of 7 technical and vocational schools which offer ICT study programs and non-IT programs simultaneously, showed that the IT teachers and students are performing well in basic and intermediate ICT subjects. Furthermore, basic knowledge about computer and its utilization have already been compulsory in the curriculum for the junior and senior high school since 1999.

Assumption

The demand of ICT basic competencies in the curriculum of elementary teacher training program and the utilization of ICT to convey the teaching and learning activities in the HYLITE program should motivate the lecturers to develop capabilities in the necessary ICT utilization to help the students mastering the curriculum. The provision of ICT infrastructures should motivate the institutions to train the lecturers to master the ICT basic competencies such as word/dataprocessing, and email and internet utilization, which are necessary in teaching and learning activities especially for the HYLITE program. It is assumed that lecturers in the UNIMED and UNG will have similar capabilities in ICT utilization, since both of institution received the INHERENT program and should consider achieving the ICT literacy of the 80% by 2009.

Methodology

To study of ICT capabilities of the lecturers in the two institutions, an instrument is developed (Appendix 1). The questionnaire is adapted from the UNESCO questionnaire. The questionnaire is developed to assess the ICT infrastructure, hardware, and software availability and utilization according to the lecturers. This paper focus on the use of *specific programs (word/data processing, PowerPoint, internet, and email),* and how many hours the lecturers use *the computers, email and internet.* 10 lecturers from UNIMED and 14 Lecturers from UNG filled the survey.

Analysis and Discussion

Universitas Negeri Gorontalo (UNG) is a state university that participates in the HYLITE program and Universitas Negeri Medan (UNIMED) offers face-to-face PGSD program. The number of

lecturers who were involved in UNG was 14 and UNIMED was 10. Table 1 shows that some lecturers either from UNG or from UNIMED did not answer some questions (look at column N, the number is not consistent). In this study ? = 0.05.

Table 1
Group Statistics of ICT Capabilities and Utilization of UNG and UNIMED Lecturers

Group Statistics

	no.	N	Mean	Std. Deviation	Std. Error Mean
word processing	UNG	14	3.21	1.251	.334
	UNIMED	8	3.13	.835	.295
spread sheet	UNG	14	3.57	.938	.251
	UNIMED	9	2.78	.441	.147
power point	UNG	14	3.64	.842	.225
	UNIMED	9	2.89	.601	.200
e-mailing	UNG	14	3.36	1.082	.289
	UNIMED	8	2.38	.744	.263
internet browsing	UNG	14	2.64	1.277	.341
	UNIMED	7	2.43	1.134	.429
years use comp	UNG	12	3.33	1.073	.310
	UNIMED	10	2.90	1.101	.348

Table 2 shows that the ability of lecturers in using word-processing was not different ($p = 0.843 > 0.05$). In this case, variance on word-processing was not similar. It was showed by Levine's test where $0.037 < 0.05$. It can be assumed that all lecturers have the ability of utilizing word-processing program. Nowadays people rarely use handwriting for formal documents.

On the ability of spreadsheets utilization, the variance was also different ($0.022 < 0.05$). However, the ability of lecturers in using spreadsheet was significantly different ($0.013 < 0.05$). Here, lecturers from UNG were better than UNIMED's. Spreadsheet is an advance program for data processing and it can be very helpful in processing

large amount of numeric data. Apparently, the lecturers from UNG who participate in the HYLITE program, a distance learning system, are more ready to handle big amount of data generated from big numbers of distance learning students.

Similar thing has also happened in the ability of using PowerPoints. Lecturers from UNG have better ability than lecturers from UNIMED. The difference can be seen from Sig. 2 tailed ($0.03 < 0.05$). Here the variance was similar. It can be assumed that the lecturers from UNG are more familiar with ICT programs, which can help them to make teaching and learning activities more interesting.

Table 2
Test of Equality of Variance

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
word processing	Equal variances assumed	4.996	.037	.179	20	.859	.089	.498	-.949	1.128
	Equal variances not assumed			.200	19.347	.843	.089	.446	-.843	1.022
spread sheet	Equal variances assumed	6.092	.022	2.362	21	.028	.794	.336	.095	1.492
	Equal variances not assumed			2.732	19.696	.013	.794	.291	.187	1.400
power point	Equal variances assumed	2.595	.122	2.325	21	.030	.754	.324	.079	1.428
	Equal variances not assumed			2.503	20.672	.021	.754	.301	.127	1.381
e-mailing	Equal variances assumed	1.133	.300	2.268	20	.035	.982	.433	.079	1.885
	Equal variances not assumed			2.513	19.111	.021	.982	.391	.164	1.800
internet browsing	Equal variances assumed	1.107	.306	.375	19	.712	.214	.571	-.981	1.410
	Equal variances not assumed			.391	13.519	.702	.214	.548	-.965	1.393
years use comp	Equal variances assumed	.019	.892	.932	20	.362	.433	.465	-.536	1.403
	Equal variances not assumed			.930	19.101	.364	.433	.466	-.541	1.408

In e-mailing, the variance was similar, but the ability of lecturers from UNG were above the ability of lecturers from UNIMED. This information can be seen from Table 1 and Sig. 2 tailed (0.035 < 0.05) from Table 2. The lecturers from UNG, which participates in the HYLITE program, get special training in utilizing email for online tutorial to guide the distance-learning students in studying the learning materials. The Lecturers have to help the students by sending 5 initiation materials that help the students to focus their independent study of the materials gradually within five months. This situation can explain the advance ability of UNG lecturers in using email.

The ability of internet browsing of lecturers from the two universities was similar. The difference was not significant (0.712 > 0.05). The average ability was UNG = 2.64 and UNIMED = 2.43. Most lecturers should have the ability of browsing the internet to get instant information as fast as possible. Sometimes, it is easier to get academic information from the internet than going to the library to find the appropriate data. Apparently all lecturers already experience the advantages of internet in getting the right data or information.

The length of turned in using computers from these two universities was also similar. The difference was not significant (0.362 > 0.05) as can be seen on Table 3.

Table 3
Group Statistics for the length of time in utilizing the computer

Group Statistics

	no.	N	Mean	Std. Deviation	Std. Error Mean
how many hours	UNG	12	2.67	1.723	.497
	UNIMED	10	2.60	1.265	.400
how often	UNG	10	4.10	1.287	.407
	UNIMED	10	2.00	1.333	.422

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
how many hours	Equal variances assumed	3.652	.070	.101	20	.920	.067	.657	-1.303	1.437
	Equal variances not assumed			.104	19.738	.918	.067	.638	-1.266	1.399
how often	Equal variances assumed	.268	.611	3.584	18	.002	2.100	.586	.869	3.331
	Equal variances not assumed			3.584	17.977	.002	2.100	.586	.869	3.331

The two universities provide the same access to their lecturers in using computer at their Universities. This similarity can be seen from Table 4, where $0.920 > 0.05$. However, the frequencies in using internet were significantly different ($0.002 < 0.05$). Lecturers from UNG use internet more often than their colleagues from UNIMED do ($4.10 > 2.00$).

This is probably an effect of the HYLITE program, which offers web-based course materials as one of the learning resources. To utilize the web-based course materials the UNG lecturers need advance abilities in utilizing the internet. The UNG lecturers are more capable in using the Spreadsheet and PowerPoint program, so that they are using computers more often than their colleagues at UNIMED. Moreover, if each computer is connected to the internet, the UNG lecturers can access the internet more often than the lecturers from UNIMED.

Conclusion

The HYLITE program necessitates the lecturers to connect with students at least 5 times within five months each semester. This further necessitates each lecturer to develop capabilities in email utilization to send the initiation materials to all students who participate in his/her course. They also develop the capabilities to utilize internet to help students in utilizing the Web-based course materials or to provide references to answer students' questions. This mini study shows that lecturers from UNG who participated in the HYLITE program have similar capabilities in utilizing the word-processing program with Lecturers from UNIMED. However, the UNG Lecturers were more familiar with spreadsheet, PowerPoint, and email. The UNG lecturers gradually developed the abilities to adapt to the demand of ICT-based distance learning system, i.e.: utilizing internet to communicate to the distance learners and using the

spreadsheet to manage large amount of data from the results of students' assignments.

Nevertheless, the UNIMED lecturers are already on the right track to comply with the demand of ICT literacy set by the government. The UNIMED lecturers need more training and motivation to utilize ICT in the teaching and learning activities.

References

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UNESCO Website

Appendix 1

Survey Instrument for Faculty members

(This portion is to be filled up by faculty members)

1. Name of Faculty member:

2. Name of University:

3. Address:

4. E-mail address:

5. Type of University:
   | Public /government | private

6. Gender:
   | Male | Female

7. Age (in years):
   | Under 30 | 30-50 | Over 50

8. Number of years in service:

9. Designation (Jabatan Fungsional):

10. Educational Level:
    | S-1 | S-2 | S-3

11. Academic levels taught: (please check all that apply.)
    | D-2 | D-3 | S-1 S-2 | S-3

12. In which subjects do you use ICT as teaching tool?(Check

all that apply)

ICT subject	Indonesian language	Science
Social science	Local language	English
Music	Civic education	Mathematics

Pedagogy (belajar dan pembelajaran)
Nationalism (kewiraan)
Others (please specify)

13. How many years have you been using computers?
    Less than one year 1-2 Years
    3 - 4 Years more than 5 Years

14. Did you receive any training in information and communication technology (ICT) over the past 3 years?
    Yes No

If yes, please indicate the following:

Title of training received	Training organizer	Total number of days	Level of training		
			Basic	Inter-mediate	Advance

15. What are your main reasons for attending computer training?

Career enhancement	Personal growth
Training is required	Others (please specify)

16. Please rate your expertise in the use of the following:

	Excellent	Very Good	Good	Fair	No Capability
Word processing					
Spreadsheets (Excel)					
Presentation tools (PowerPoint)					
E-mailing					
Internet browsing					
Statistical tools (SPSS or others)					
Graphics					
Web page designing					
Programming					
Database management					
Project management					
Learning Management System (MOODLE, or others)					

17. How often do you use ICT tools in the following purposes:

	Very often (everyday)	Often (twice or more a week)	Seldom	Never
Teaching-learning for specific subjects				
Teaching computer skills				
Finding/accessing information and educational materials				
Making presentations/lectures				
Preparing lessons				
Communicating with students				
Communicating with other teachers				
Monitoring and evaluating students' progress (keeping track of student's performance)				
Preparing reports Further personal development				

18. Please check under each column to indicate that you have or have no access to computers and Internet in the following:

Location	Computer		Internet	
	With Access	Without Access	With Access	Without Access
University At home Commercial places (Warnet) ICT centre (or others)				

19. Where do you use computers at University?
    |Computer laboratory |Classroom |Teacher's lounge
    |Administrator's office |Library |Others (please specify):

20. How many hours per day are your university's computers accessible to you?
    |Less than one |1-2 |2-4
    |4-6 |6-10 |More than 10
21. Do you use computers outside of academic hours?
    |Yes |No
22. If you have access to the Internet, how often do you use it at the university?
    |Never |Once a month |Once a week
    |Several times a week |Everyday
23. How do you use Internet in your job as a faculty member?
    |For teaching specific lessons in various subjects
    |For making presentations/lectures
    |For preparing lessons
    |For communicating with students
    |For communicating with other faculty members

|For accessing and using online assessment tools
|For preparing papers and teaching materials
|For collecting handouts and reference materials
|Others (please specify)

24. Do you maintain a personal web page as teaching tool?
|Yes |No

25. Please write your opinion, suggestion, and other comments related to ICT infrastructure and utilization in the PGSD Program. Your comments are highly appreciated.