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# AN INVESTIGATION INTO THE NEED FOR ICT SKILL DEVELOPMENT AMONG LECTURERS AT THE NATIONAL UNIVERSITY OF LAOS

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## ABSTRACT

In our modern world, ICT has become more essential in all aspects of our lives. With ICT, we can access tons of information through different devices. ICT provided excellent support for lecturers to develop the skills they need to succeed in the 21st century. This study aims to examine the required level of ICT skills needed among lecturers and explore potential significant differences based on their gender and age group. The sample group were lecturers from 13 faculties, which employed stratified random sampling techniques to select 302 out of 1302 lecturers for the study. The research instrument was a 5-point scale questionnaire conceptualized in terms of four domains. Data obtained were analyzed using frequencies, mean, and standard deviation. The findings of the study indicate the needs in using Information communication and Technology (ICT) among the lecturers overall, and each domain was at a high level. Addition, there are no significant differences based on gender. Furthermore, there are significant differences between lecturers less than 30 years old on ICT professional development skills compared to other age groups. Thus, this finding can raise the awareness of educational decision makers when designing their strategic plan to organize ICT training programs for university lecturers.

**Keywords:** Needs for ICT, ICT skill, lecturer, ICT development skills

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## 1. INTRODUCTION

Imagine the world without ICT access today; it seems to be complicated. The way we live our lives is significantly impacted by the creation, advancement, and application of information and communication technologies (ICT) in today's dynamic world [1]. People in the 21st century are characterized by a number of traits shared by people living in a technologically and media-infused environment, such as: 1) easy access to a wealth of information, 2) quick changes in technology tools, and 3) the capacity for unprecedented levels of individual and group collaboration and contribution [2]. The Ministry of Science and Technology, Laos PDR, claims that ICT has been integrated and applied in many services nationwide such as education, communication, trade, business, online payment etc [3]. ICT also provides rich resources for creating new educational systems that enable interaction and long-distance communication between geographically dispersed instructor and student groups, and ICT can help educators achieve this kind of society by creating opportunities [4] while successful integration of ICT into teaching and learning requires rethinking the role of teachers and reforming their preparation and professional development [5]. The Ministry of Education has emphasized that ICT serves as a tool for fostering learning opportunities and promoting lifelong learning, enabling communities to evaluate information on education and school management. ICT integration in education in Lao PDR has been introduced and applied into the education system for more than decades. However, in order to shape lecturers to mastering in using ICT is a big challenge. A lesson learned during COVID-19 pandemic in 2019, the pandemic has affected teaching and learning at all levels in Lao PDR. Many schools were completely shut down and shifted to distance learning. Many lecturers were facing ICT barriers to teaching online, some faculties in university were shut down even though some training programs have been organized at least one in the semester but many lecturers [6]. Thus, lecturers should improve their ICT skills up to date with current technology and to ensure that lecturers can apply ICT skills into their teaching efficiency. That is why in this study, the author has focused on two primary research questions:

- 1) What is the level of ICT skills needed to develop among the lecturers at National University of Laos?
- 2) Are there significant differences between gender and age group among the lecturers at National University of Laos in terms of ICT skill development needed?

## 2. LITERATURE REVIEW

Today, ICT serves as a powerful tool to shift traditional work toward more digitalization due to technologies being more developed and user-friendly so people can access various information. Given change in society, It's difficult to resist the integration of ICT into education due to society's changes. ICT widens everyone's access to high-quality education,

closing the gap in learning and offering possibilities for those who fall behind [7]. In order to better understand how ICT is important to lecturer that why the author carried on this study to investigate the need for ICT skill development among lecturers as follows:

### 2.1 Concept of ICT

With the rapid growth of technology in this century, ICT stands for information and communication technology. ICT is a combination of two words: IT: Information and Technology refers to hardware and software to manipulate information, storing, searching, presenting, and sharing information through electronic devices, and another word is CT: Communication Technology refers to tools and methods for communication, so it is called “Information and Communication Technology: ICT” [8]. According to [9] defined ICT is defined as the knowledge, skills, and aptitude for using a variety of technologies used in the process of gathering, storing, modifying, retrieving, and transferring data in different formats, while [10] defined ICT includes many technological means for managing, storing, and distributing information, including computers, the Internet, and broadcasting technologies. Additionally, ICT is described as the handling and processing of data (texts, pictures, graphs, instructions, etc.) for use with electronic and communication equipment, such as phones, computers, and cameras [11]. From these definitions mentioned above, ICT can be defined as all technologies for information manipulation, communication, and can thus be described as the processing and sharing of information via various electronic devices.

### 2.2 ICT usage in education and Lao context

Information and communication technologies' (ICTs) explosive growth has provided many opportunities to strengthen the education system. ICT is increasingly used in teaching and learning in education especially in higher education. [12] indicated that successful ICT-savvy instructors are excellent in communicating, records-keeping, and classroom instruction. in their investigation on lecturers' ICT proficiency. ICT is one of the tools for pedagogy to support teaching and learning and has become a tool to encourage learners to explore skills such as analyzing, problem solving, question and answer finding, describing, collaboration, and communication to create new knowledge through these processes. [8] In developing countries like Lao PDR which has recognized the importance of information communication technology (ICT) in education for more than a decade, different policies regarding ICT for education development have been added to national strategic plans. In practice, ICT has been integrated and taught from primary education to higher education to prepare students and teachers ready for the digital world. However, during the COVID-19 outbreak in 2019, many lecturers were facing big challenges due to the rapid change from traditional classroom to online teaching. In order to respond to the emergency situation, the Ministry of Education and Sports (MoES) had to instantly deploy education TV channels and rapidly develop e-learning contents to publish on television and social media platforms.

Additionally, MoES worked closely with UNICEF to developed the MoES teaching and learning platform “Khang Panya”, which aims to (i) facilitate the learning of children and adolescents, allowing for continuity of learning during school closures and as a supplementary learning resource to face-to-face classes and learning at home, (ii) enhance teaching by supporting the work of and professional development of teachers, principals, pedagogical advisors, and education technical staff by providing resources; and as a platform for blended trainings, (iii) enhance the digital skills of Lao children, young people, teachers, and education staff [13]. Moreover, under the support and collaboration of UNESCO Bangkok through the Capacity Development for Education (CapED) in Lao PDR program, we developed ICT Competency Standards for Teachers in Lao PDR to enhance teachers' ICT competencies. Currently, the ICT Competency Standards for Teachers in Lao PDR have been integrated into the teacher education curriculum, especially for early childhood, primary and secondary teacher education programmes [14]. Therefore, the goal is to guarantee that both teachers and students have unrestricted access to information and can fully utilize ICT in their educational endeavors.

A previous study carried out by [15] aims to focus on the ICT condition usage, the need for ICT training, and explore the guidelines for ICT development, which were collected from 460 teachers and 32 administrators in Lao teacher education institutions, Laos. The findings have indicated that most of the teachers highly needed to improve their Microsoft Office (PowerPoint) to design a presentation, make a poster, and book cover (mean: 4.08), follow by using tools in Google tools such as Google Classroom, Google Meet, Google forms (mean: 4.05), design a book cover and documents (mean:4.00) and the teacher using Microsoft Office (Word) in formatting documents for writing textbooks was the lowest item to require training needed in this study (mean: 3.92). Another study was conducted by [16], which intends to examine Laotian academics' perception of the ICT tools and platforms needed, level of ICT usage, and required ICT training from 11 Laotian academics who are directly involved in research building social research capacities under ERASMUS project. More than half of the academics need to use ICT tools such as SPSS and SurveyMonkey (55%), Google Scholar, and Gamarly (54%), followed by Google Search Engine (46%).

### 2.3 ICT Competency Standard Framework for teacher

In response to the Sustainable Development Goals (SDGs), UNESCO has taken action, especially on Goal 4: Quality of Education, in many activities, which include the development of ICT Competency Standard Framework for teachers (ICT-CFT). There are three versions of the ICT-CFT, which have been developed in 2008, 2011 and 2018. The ICT CFT Version 3 focuses on implementing the realization of these international commitments by providing a guide for the development of effective ICT in education teacher training programs that are intended for contextualization to local and national needs, and the ICT competency framework for teachers (ICT-CFT) becomes a guideline practice to for pre-service and in-service teacher training on the use of ICT. It consists of six aspects, such as 1) Understanding ICT in Education Policy, 2) Curriculum and Assessment, 3) Pedagogy, 4) Application of Digital Skills, 5) Organization and Administration, and 6) Teacher Professional Learning. ICT-CFT consists of 18 competencies organized according to the six aspects of teachers' professional practice, over three levels of teachers' pedagogical use of ICT, such as level 1: Knowledge Acquisition, level 2: Knowledge Deepening and level 3: Knowledge Creation [5].

To meet the demands of education in Laos PDR, the Ministry of Education and Sport had decided to develop an ICT Competency Standard Framework for Lao teachers, collaborating closely with UNESCO Bangkok to oversee this project. The project was sponsored by UNESCO Bangkok and intends to 1) provide both technical and practical support to develop the ICT competency standards for Lao teachers which match with the educational strategic plan; 2) to strengthen the ICT knowledge of Lao teachers to capable and confident to apply ICT in their teaching as well as to ensure that students can formulate a new idea or knowledge by themselves. Essentially, the framework was designed and developed based on UNESCO ICT-CFT version 3. It consists of six domains: Understanding ICT Policy in Education; Curriculum and Assessment; Pedagogy; Application of Digital Skills; Organization and Administration; and Teacher Professional Learning with three proficiency levels: level 1: Basic level consists of 14 performance indicators; level 2: proficient level consists of 16 performance indicators; level 3: advanced level consists of 17 performance indicators [14]. Finally, The framework has been approved and declared to be used by the Ministry of Education and Sport in 2022.

### 3. METHODOLOGY

The descriptive survey was adopted for the study. The quantitative method involved the process of collecting, analyzing, interpreting, and writing the result of the study [17]. The total 1302 population for this research were lecturers from five campuses and 13 faculties in the National University of Laos, Vientiane Capital, Lao PDR. A stratified random sampling was applied to select the sample for this study. A sample of 302 respondents was selected to participate in this study. A questionnaire was distributed to lecturers in 13 faculties through the faculty's office. The data was collected manually and online through Google Forms during September, 2023. A questionnaire consists of 66 indicators and was categorized into four main domains, including ICT literacy skills, ICT tools for teaching skills, ICT for professional development, Ethnicity of ICT skills, the details in each domain are summarized in Table 1. The  $\alpha$ -values of at least 0.6 indicate that the items are reliable [18].

**Table 1.** Descriptive on section of the questionnaire instrument associated with reliability value

Section	Description	Number of Indicators	Scale	Reliability Value
A	Demographic (Include gender, age, qualification and teaching experience)	5		
B	ICT literacy skills	18	Scale from 1-5 1: Very low, 5: very high	0.96
C	ICT tools for teaching skill	15	Scale from 1-5 1: Very low, 5: very high	0.97
D	ICT for professional development	14	Scale from 1-5 1: Very low, 5: very high	0.98
E	Ethnic of using ICT skills	14	Scale from 1-5 1: Very low, 5: very high	0.97
	Total	66		

#### 4. ANALYSIS

The quantitative data was analyzed using Statistical Package for Social Sciences (SPSS) to find out Frequency, Percentage, Mean and Standard Deviations. A descriptive statistical analysis is described in this section in order to provide a broad understanding of the lecturers' perception of the need for ICT development skill. The respondents were asked to fill out the questionnaire to rate their level of need for developing their ICT skills according to their need on a five item Likert scale format: (1) very low needed, (2) low needed, (3) moderate needed, (4) high needed and (5) very high needed. In order to determine the respondents' level of need to develop ICT skills in four domains, The author has divided the five-point scale into five levels: very high, high, moderate, low, very low [19] (Best, 1981). Table 2. Illustrate the necessary ICT level determination.

**Table 2.** Determination of ICT level needed

SN.	Mean range	Level of ICT needed
1	1.00 - 1.49	Very Low
2	1.50 - 2.49	Low
3	2.50 - 3.49	Moderate
4	3.50 - 4.49	High
5	4.50 - 5.00	Very High

#### 5. RESULTS AND DISCUSSION

The total of 305 lecturers have been selected using stratified random sampling techniques to participate in this study. The questionnaire was distributed to lecturers in both paper-based and online questionnaires through Google Forms links according to their preferences. All 305 lecturers have returned a questionnaire, while some items in the questionnaire are missing. Demographic data indicates that 155 respondents (51.80%) are male while 144 respondents (48.20%) are female lecturers. The data also indicates that 28 respondents (9.30%) are between 20-30 years old, more than half of them, 139 respondents (46.30%), are between 31-40 years old, while 98 respondents (32.70%) of them are between 41-50 years old and only 35 respondents (11.70%) of them are above 50 years old. In terms of the respondent's qualification, the majority of the 217 respondents (74.10%) of the lecturers are holding a Master degree; there are 41 lecturers (14.00%) holding a Bachelor degree and only 35 lecturers (11.90%) holding a Doctorate degree. The data also indicate that 189 respondents (64.30%) have teaching experience more than 10 years, while 60 respondents (20.40%) are having teaching experience between 6 to 10 years and only 45 respondents (15.30) are young lecturers with less than 5 years of teaching experience. In addition, the respondents are from 13 faculties shown in Table 1.

**Table 3.** Frequency and percentage of respondents categorized by faculty

SN.	Faculty	Number of respondents	Percentage
1	Faculty of Agriculture	14	4.60
2	Faculty of Social Science	23	7.60
3	Faculty of Education	49	16.20
4	Faculty of Economic and Business Management	21	7.00
5	Faculty of Architecture	15	5.00
6	Faculty of Environment Science	16	5.30
7	Faculty of Water Resources	13	4.30
8	Faculty of Law and Political Sciences	22	7.30
10	Faculty of Sport Sciences	20	6.60
11	Faculty of Natural Sciences	9	3.00
12	Faculty of Language Education	26	8.60
13	Faculty of Engineering	31	10.30

In terms of ICT development skill levels needed among the lecturers in four domains are summarized in Table 4.



**Table 4.** ICT skills needed among the respondents

SN.	Domain (N=305)	Mean	S.D	Level of Needed
1	ICT literacy skills	3.89	.83	High
2	ICT tools for teaching skill	3.77	.87	High
3	ICT for professional development	3.64	.93	High
4	Ethnic of using ICT	3.63	.85	High
	Total	3.63	.70	High

Based on Table.4, it revealed that overall, the respondents are ‘highly’ needed to develop their ICT skill (mean:3.63). On the other hand, the respondents claimed that the highest skill they needed to develop from the domain “ICT literacy skills” were acquiring knowledge of presentation applications such as Microsoft PowerPoint to create professional presentations design (mean: 4.08), advanced Word Processing applications and using video conferencing application such as Google Meet or Zoom to participate online conference and online teaching (mean:4.01) while the domain “ICT tools for teaching skill” the respondents indicated that ICT skill they need to develop the most three indicators were earn highest score such as applied ICT into lesson plan design to appropriate with the curriculum, using ICT to develop teaching materials and design teaching and learning activities to allow student learning better (mean:3.86) whereas the respondents highlighted using Mind mapping application to help students were no longer needed. Meanwhile, domain “ICT for professional development” the respondents highlighted the most important ICT skill they needed were skills which they are capable to create a online learning environment for learners to support learning anywhere and anytime or e-learning (mean: 3.75), create teaching material and share to other colleagues or lecturers community through internet (mean:3.69) and create e-learning contents and share in online platform like YouTube, TikTok and others (mean: 3.68) and domain “Ethnic of using ICT” the respondents reflected that practicing digital manners on social media involves prioritizing well-being, respect other, insulting or harassing behavior, and avoid from cyberbullying are the most recommended skill to improve and behave in digital world (mean:3.92), understand users privacy protection in order to avoid sharing personal information which might be risk to involve in online threats such as fraud, scammer and hacker (mean: 3.91) and another issued was need to improve on critical thinking which applied to identify and critique proper information (mean: 3.90). Thus, the majority of the respondents are skilled in the overall four domains. However, the respondents also revealed a moderate level which means the skill on web browsing applications such as Chrome or Safari to access and search information on the Internet is no longer needed to improve (mean:3.26). This finding on ICT skill development needed for lecturers is consistent with [15] study on the needs for ICT training of the teacher are highly needed, while [16] study in ICT tools training is needed, and [19] study in lecturers’ level of competence with ICT is at a good level.

The purpose of this study also intends to investigate whether there are any significant differences on the four domains of ICT skill development needed include (i) *ICT literacy skills*, (ii) *ICT tools for teaching skill*, (iii) *ICT for professional development* and (iv) *Ethnic of using ICT skills*, between the male and female lecturers and between lecturers from different age groups. The independent sample t-test was conducted, and the results are shown in Table. 5

**Table 5.** The t-test result show a significant different in ICT skill development between genders among the lecturers

SN.	Domain	Gender (M:155, F:144)	Mean	S.D	T	df	p-value
1.	ICT literacy skills	Male	3.91	.75	.46	278.36	.64
		Female	3.87	.90			
2.	ICT tools for teaching skill	Male	3.81	.85	.97	297	.33
		Female	3.72	.89			
3.	ICT for professional development	Male	3.63	.95	-.09	297	.92
		Female	3.64	.92			
4	Ethnic of using ICT skills	Male	3.64	.79	.20	297	.83
		Female	3.62	.91			

Significant level .05\*

The results reveal that there is no statistically significant difference between male and female lecturers in four domain whereas male lecturer slightly need to develop ICT skills more than female lecturers in aspect of *ICT literacy skills* (male:  $X=3.91$ , female:  $X=3.87$ ,  $t=-.46$ ;  $p>.05$ ) as well as *ICT tools for teaching skill* male lecturer also need to develop ICT skills more than female lecturers (male:  $X=3.81$ , female:  $X=3.72$ ,  $t=-.97$ ;  $p>.05$ ) while female lecturers seems to need to ICT skills more than male lecturers in aspect of *ICT for professional development* (male:  $X=3.63$ , female:  $X=3.64$ ,  $t=-.09$ ;  $p>.05$ ). However, in terms of *Ethnic of ICT skills* male lecturers slightly need to develop ICT skills more than female lecturers (male:  $X=3.64$ , female:  $X=3.62$ ,  $t = .91$ ;  $p > .05$ ).

On the other hand, the analysis revealed a significant difference on domain of *ICT for professional development* for lecturer in the difference age groups (20-30 years old:  $X=4.19$ , 31-40 years old:  $X=3.68$ , 41-50 years old:  $X=3.54$ , 50 year old above:  $X=3.24$ ;  $F\text{-value}=6.16$ ;  $p\text{-value}=.00$ ). The post-hoc analysis shows that the lecturer who are between the 20-30 years old group need to develop ICT significantly more than those 31-40 years old, 41-50 years old and those more than 50 years old. Meanwhile, there were no significant differences in the other three domains in those age groups where the results are shown in Table.6.

**Table 6.** Results of f-test on the differences of ICT skills as a function of age

SN.	ICT skill		Sum of Square	df	Mean Square	f	p-value
1.	ICT literacy skills	Between Group	1.72		.57	.83	.47
		Within Group	203.22		.68		
		Total	204.94	299			
2.	ICT tools for teaching skill	Between Group	3.11		1.03	1.37	.25
		Within Group	223.97		.75		
		Total	227.08	299			
3.	ICT for professional development	Between Group	15.31		5.10	6.16	.00*
		Within Group	244.97		.82		
		Total	260.28	299			
4	Ethnic of using ICT skills	Between Group	5.47		1.82	2.56	.05
		Within Group	210.92		.71		
		Total	216.39	299			

Significant level .05\*

Based on Table 6. There were non-significant differences among three domains. The post-hoc analysis also revealed that there were significant different in *ICT literacy skills* between (20-30 years old:  $X=3.92$ , 31-40 years old:  $X=3.95$ , 41-50 years old:  $X=3.86$ , 50 year old above:  $X=3.71$ ;  $F\text{-value}=.83$ ;  $p\text{-value}=.47$ ), *ICT tools for teaching skill* (20-30 years old:  $X=4.00$ , 31-40 years old:  $X=3.78$ , 41-50 years old:  $X=3.76$ , 50 year old above:  $X=3.55$ ;  $F\text{-value}=1.37$ ;  $p\text{-value}=.25$ ) and *Ethnic of ICT skills* (20-30 years old:  $X=3.96$ , 31-40 years old:  $X=3.63$ , 41-50 years old:  $X=3.64$ , 50 years old and above:  $X=3.37$ ;  $F\text{-value}=2.56$ ;  $p\text{-value}=.12$ ). In general, lecturers who are less than 30 years old need to develop ICT skills significantly more than those 31-40 years old, 41-50 years old and 50 year old and above group from this finding, it is expected that the lecturers in the younger generation are confident in using general ICT but they might have in-experience in using ICT for their professional development. This finding is supported by [12] study in teachers' ICT integration between male and female teachers, and between teachers in different age groups and found out there were significant differences between the age group of the teacher who is less than 30 years old. Similarly, the study conducted by [20] studies on ICT literacy among lecturers and found out there were no significant ICT literacy levels based on gender and age group.

## 6. CONCLUSION

Based on findings, it is concluded that in general lecturers at the National University of Laos are strongly needed to improve ICT skills especially advanced ICT competencies skill such as presentation design skill more professional, ICT to design a lesson planning, teaching activities, teaching material and share in teacher community, digital well-being, and digital citizenship. The finding also revealed that male lecturers slightly require more ICT skill development than female lecturers while lecturers who age younger than 30 years old require to improve ICT skills on professional

development skill more than other group age especially the item regarding creating a learning environment for learners to support learning anywhere and anytime while the senior lecturers need to develop ICT skills less compare to other group age so that senior lecturer should be more encourage to use ICT more to ensure that no one should left behind in developing ICT skills more efficiency.

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