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Master's Thesis of Arts

ICT Integration in Teacher Education

A Teacher Training Institute Case in Lao PDR

교사교육과 ICT 통합
라오스 교원양성기관 사례를 중심으로

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ABSTRACT

ICT Integration in Teacher Education

A Teacher Training Institute Case in Lao PDR

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Information and Communication Technology (ICT) integration in education has gained global popularity, yet, not much has been known about how ICT has integrated into teacher education in Lao PDR. This study applies UNESCO's four stages continuum model and SEAMEO's ten-dimension framework to make a comprehensive description of the situation of ICT integration in a teacher training institutes in Lao PDR, marking both the achievement and challenges.

This study chooses Luang Prabang Teacher Training Colleges (LPB TTC) as the research site. It targets on collecting experience in regard of ICT of the pre-service teachers (PTs) and teacher educators (TEs). Based on the short-term field research in and documents review, the study reveals that although the overall situation is still at the emerging or applying stages from most aspects, there exists several practices showing that Lao PDR still has much potential to develop advanced ICT integration in teacher education: using ICT for creating teaching and learning materials, using ICT for teaching instructional design, creating teachers' online community for easier knowledge sharing and policy borrowing and individual use of PTs and TEs for problem-solving. At the same time, it identifies the stages in five levels

of ICT integration in teacher education in Lao PDR: (1) policies and major practices at the national level; (2) campus culture, infrastructure and facilities, the pre-service teacher curriculum, activities in which ICT is engaged with at the school level; (3) training experience in local computer centers and secondary schools, PPP and teachers' online group at the community level; (4) the first experience, purpose at the individual level with ICT products and (5) the practices of global partnership in reference with ICT integration in teacher education. It also finds that the common 'ICT' in the local context refers to (1) ICT products which can be personal possession (e.g. computers, mobile phones); (2) ICT infrastructure (e.g. Internet); (3) ICT skills for various purposes (e.g. for teaching and learning, for daily use, for work and problem solving) and (4) ICT as an integral part of habit and hobby.

Although the study also looks for more effective ICT integration in teacher training institutes and highlights the potential of mobile learning in future teacher education in Lao PDR, due to challenges such as the huge digital gap and urban-rural gap, it is not able to claim that ICT integration brings better quality of teacher education and is more feasible and effective than the traditional way of learning and teaching. Thus, further studies are needed to continuously explore and examine the influences and outcomes.

**Keyword: ICT Integration, Teacher Education, Teacher Training
Institute, Lao PDR**

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CHAPTER I. INTRODUCTION

1.1. Background

Since the first use of the computer in teacher education in 1996, there has been huge progress in improving the quality of pre-service teachers (PTs) from preschool to secondary level in Lao PDR. During its 20 years of endeavor in human resource development and the telecommunication expansion, the previous ‘landlocked’ and ‘Least Developed Country (LDC)’ profile is getting more open and transformative than before. Since 2010, the ‘5+3+3’ 11-year education system has been extended to ‘5+4+3’ of 12 years, marking the turning point of larger social responsibility of lower secondary schools and Laos’ earnest pursuit of joining education globalization. This one extra year at lower secondary requires Teacher Training Institutes (TTIs) to prepare extra teachers with new essential skills to satisfy the social demands of more access and better quality of education. At the same time, information and Communication Technology (ICT) is one of the skills that teachers eagerly strive to equip themselves with.

With the increment of ICT equipment and ICT skills mastered teacher educators (TEs) in teacher education, the role that ICT played in Lao TTIs has gradually evolved from an ‘exhibit’ and the ‘luxury of few educational elites’ to a ‘useful tool to support educational activities’ and an ‘attitude towards learning and teaching’ which most teachers can have. In the early 2000s, when Lao education was in extreme scarcity of ICT knowledge, materials and human resources, teacher education about ICT started in a form of training workshop. The most abled educators were selected to learn about computers and database. During that time, the first version of textbooks about basic computer skills written by Lao scholars in the Lao language was also published. It represented that the basic framework of education about ICT was formed. Later in 2009, ICT integration in teacher

education was first mentioned in The Education Sector Development Framework (ESDF) by Ministry of Education and Sport (MoES).

Since ICT was first integrated into the lower secondary curriculum as a subject, it has gained growing popularity in teacher education. In 2015, Teacher Education Evaluation Department (TEED) of MoES published the 5-year official quota of educational planning which included the mission to train 836 new ICT teachers for the lower secondary school. In addition, although some TTIs initiated computer courses about 10 years ago, it was not until the academic year 2014-15 that a specific curriculum for training basic ICT teachers was implemented. New subjects such as ICT supported pedagogy and computer basic skills are added into existing curriculum of non-ICT majors. E-lessons are also integrated into the instruction at tertiary level including general semester programs in TTIs.

1.2. Problem Statement

As the access to both ICT and education resources is not equally created and distributed around the world, countries like Laos are under great pressure to narrow the digital and literacy gaps with the developed countries. Despite Laos' efforts in integrating ICT in teacher education, for instance, the numerical increment in ICT equipment in TTIs, the insufficiency in infrastructure, facilities, teaching and learning materials (TLMs), teaching aids have always been the major obstacle to the improvement of education quality and better ICT integration. Low ratio of teacher education budget also impedes more enrollment in TTIs. A former director of MoES explained in 2008 to Vientiane Times that the governmental budget could only offer less than half of the actual need. As reported by the Teacher Education Management Information System (TEMIS) of MoES, the quota for new secondary school teachers in the academic year 2016-2017 appears a trend of decreasing.

However, there is little empirical evidence to indicate how ICT is integrated in Lao teacher education. The difficulties experienced at the

individual and school levels have not been clearly identified or completely solved yet.

1.3. Purpose of the Study

This study seeks a developmental view to look for achievements and challenges of ICT integration in teacher education in Laos. By describing the single case of ICT integration in Luang Prabang Teacher Training College (LPB TTC), it aims to understand how ICT is integrated into teacher training institutes in Laos. It also intends to identify challenges from perspectives of school, teacher educators (TEs) and the pre-service teachers (PTs) and concern about effective ICT integration for TTIs in Laos.

1.4. Research Questions

This study is guided by three research questions:

- 1) How has ICT been integrated into teacher education?
- 2) How has ICT integrated into LPB TTC?

The first question ‘How is ICT integrated into LPB TTC?’ is the leading question of this study. To answer it, this study describes the environment, ICT infrastructure and facilities, curriculum, educational activities, daily experience with ICT and related attitudes and habits about ICT integration in LPB TTC. The descriptions are generated from campus and class observations, on-site and online interviews, database, official reports and varied field materials. The second question answered by literature review is constructed to support the first question.

1.5. Significance of the Study

The significant findings of this study are twofold.

First, comparative education is obliged to understand the education development of Laos and this study takes this duty by exploring how ICT has been integrated into a teacher training institute in Laos. Joel Samoff suggests in his chapter of the book ‘Comparative Education: The Dialectic of the Global and the Local’ to trace the education development with special

concern on the experiences of the world's poorer countries and particularly those that earned their independence during the second half of the twentieth century (Arnove, Torres, & Franz, 2012). Compared to other decolonized countries lying on the Indochina Peninsula, Laos is not a popular topic for comparative education studies and its research culture has not developed yet. Thus, this study hopes to expand the academic focus on Laos, attract more people to learn from Laos' experiences in education both the progress and challenges.

Second, this study seeks to inaugurate a comprehensive description of the case to fill the gap of empirical research on ICT integration in Teacher Education in Laos. The landscape of teacher education and ICT development in Laos has transformed dramatically in the past two decades: the new education system, ICT integrated curriculum reform, the new requirement for teachers' skills and newly developed textbooks and e-lesson system. Continuous research is compelled to track the trends of this process. This study will bring new thoughts about how to make ICT integration in teacher education in the less developed countries more effective, culturally compatible and environmentally friendly. It hopes to exchange ideas with scholars and educators of domestic Laos and other countries who are interested in this topic and related issues to create better conditions and incentives for the provision of the widest possible access to ICT for teachers and their students.

CHAPTER II. LITERATURE REVIEW

2.1. Context of ICT Integration in Education: Definition and Role

It has been acknowledged widely of the remarkable role that Information and Communication Technology (ICT) plays in the improvement of quality education for all (EFA). But what is ICT in education? Starting from the standpoint of technology, according to UNESCO scholars Shinohara and Nan-Zhao, it includes the hardware (infrastructure and facilities) implemented in education which is composed of teaching/learning materials (TLM), interactive classroom furniture (blackboard, projector and projection screen and interactive whiteboard, etc.), fixed and mobile computing devices and Internet and the software (knowledge and competencies/skills) to utilized them. From an educational perspective, it emphasizes on ICT related curriculum, attitudes, educational administration and activities of teaching, learning and breaking the facilitators (students, teachers, and administrators, etc.)' isolation from each other through on-line/off-line networking.

The Southeast Asian Ministers of Education Organization (SEAMEO) emphasizes the importance of equipping everyone ICT skills to function effectively in a knowledge-based and technologically advanced society and to avoid marginalization (2010). The onset of the Post-2015 Development Agenda and the proposal of 17 Sustainable Development Goals (SDGs) coincided with a fifteen-year review of the outcome of the 2000 World Education Forum in Dakar in Senegal. The new SDGs address the provision of quality education and lifelong learning which implies the important role of ICT in education. ICT is expected to deal with problems such as insufficient education in remote areas, teacher and teaching materials shortage, multicultural and multilingual education, etc. Presumably because of the assumed but unproven and therefore naive belief in an automatic connection between the ICT integration in education modernization and

better educational outcome, there is a large proportion of national education budget and educational foreign aid flowing into this part.

More and more people go through life with a view that ICT is a panacea for all social ills and conflicts, topped up with the imagination of what new education it may make. Indeed, with the absence of ICT, little can occur, but even the presence does not assure results Sayo, Chako, and Pradhan, (2004). ICT is also criticized that it fails to improve education quality so much as it promises. At the same time, it is helpless to narrow various levels of digital gap. Although the integration of ICT is changing the definition of education in terms of the student-centered learning which it promotes, new methods and pedagogy it brings and new skills and knowledge it requires, this implementation of structural adjustment seems to be an approach only really manageable in the more technology-rich countries.

2.2. Four Stages and Ten Dimensions of ICT in Education

Having analyzed the works by UNESCO experts (Anderson and Weert, 2002; UNESCO, 2005; Anderson, 2010; Mahjumdar, 2014) and other scholars (e.g. Jucevičiene) about technology or ICT integration in education and its relation to education process or education paradigm change, the researcher find the continuum model (see Figure 1) to answer the research question of ‘How has ICT been integrated into teacher education in Lao PDR. It identifies 4 stages of ICT development in education process: emerging, applying, infusing and transforming. Taking ICT integration as a developmental process, it targets to grasp a clear sense of the differences and commonalities of ICT integration development among countries, regions and areas.



Figure 1 Four stages of ICT in education

After several years of inspection of ICT integration process in education, another key question for many countries of which the process of ICT

integration in education has reached a considerable level of maturity and stability is asking about ‘How’ (the condition is). SEAMEO (2010) applied UNESCO’s four stages continuum model and identified 10 dimensions (see Table 1) to describe the necessary and sufficient conditions of ICT integration in the education of its eleven Southeast Asian member states (including Laos). These dimensions reveal the context of ICT integration in schools and the multidirectional effects among different aspects of the context.

Table 1

Ten dimensions of ICT in education

- (1) National ICT in education vision;
 - (2) National ICT in education plans and policies;
 - (3) Complementary national ICT and education policies;
 - (4) ICT infrastructure and resources in schools;
 - (5) Professional development for teachers and school leaders;
 - (6) Community/partnerships;
 - (7) ICT in the national curriculum;
 - (8) Teaching and learning pedagogies;
 - (9) Assessment;
 - (10) Evaluation and research.
-

This study merges SEAMEO’s combination framework of 10 dimensions with the initial 4 stages continuum model of ICT integration in education together but mainly based on UNESCO’s conceptualization of the 4 stages. As it finds that 1) SEAMEO focuses more on policy making at the national level and tends to have lower standard (e.g. it groups the phenomenon of ‘teachers’ personal use of ICT’ into applying stage while UNESCO regard it as a sign of the emergence of ICT integration in education); 2) while the UNESCO put more emphasis on the changes brought by ICT integration in classrooms and teachers and students’ life, this study presents the newly conceptualized 10-dimension framework adding indicators.

National ICT in education vision

Vision at the school level is a fundamental element of any educational organization recognized by all stakeholders as a common direction of

growth. According to Gabriel and Farmer (2009), a vision is the optimal goal of the school which is hoped to see in the future. It is followed by targets that measure progress toward its vision and the missions which provide an overview of the steps planned to achieve that future.

In the national level, different stages show different relations of the vision (that does with ICT) with existing culture, policies and practices. From emerging to transforming stage, the relations move from 'little consideration' to 'supporting', then to 'driving changes' and at last the ICT integrated vision is being studied and emulated by other countries.

National ICT in education plans and policies

When ICT - driven plans and policies first emerge, there is no planned funding. When ICT develops, it is led by specialists and centralized policies. Funding is invested in hardware and software. Later, there are increasing ICT plans and policies and teacher professional development is being focused on. Last, at the transforming stage, ICT is integral to overall school development plan involving all students and teachers.

Complementary national ICT and education policies

At the first two stages, the relation between the ICT in education policies and national ICT and education policies moves from 'a lack of linkage' to 'contradiction in linkage'. At the infusing and transforming stage, national ICT and education policies support ICT in education policies and ICT in education policy complements the national ICT and education policies.

ICT infrastructure and resources in schools

At the emerging stage, the implementation of ICT infrastructure and resources in schools starts which later moves to the implementation for administration (including the software for education administrative use). Almost happened at the same time, the schools expect specific outcomes of applying ICTs and ICTs are gradually incorporated as assistant tools in learning, teaching and school management. Then, the established resource-

rich learning centers, the networked classrooms, a range of devices used to support interdisciplinary subject represent the entry to the infusing stage. At the transforming stage, schools have the autonomy to manage their own infrastructure. Putting distance education in the center, the schools have realized the web-based collaboration and learning spaces, online courseware and student self-management software. They can share the digital resources that they have created with one another. The SEAMEO's report also pointed that especially in this dimension, some of the countries appear in more than one stage of ICT in education due to the differences in stages of development among the provinces or areas within each of these countries.

Professional development for teachers and school leaders

At the emerging stage, teachers have a growing awareness of the needs for professional development about ICT and of the opportunities for applying ICT to their teaching in the future which prepares the ground for moving to the applying stage. At the infusing stage, specific professional skills and integrating subject areas of ICT evolve. At the transforming stage, teachers and students have regarded ICT as an integral part of their daily life and expect a continuously changing teaching methodology designed to meet varied learning objectives. ICT enables integrated learning community where students and teachers are co-learners.

Community and partnerships

At the emerging stage, donation and investment in ICT in education are discreet, problem-driven and accidental. When schools and local organizations start seeking donations and grants, parental and community involvement in ICT, they moving towards the applying stage. At the infusing stage, global and local networked communities are formed and the subject-based learning communities are able to provide discrete, occasional assistance, by request. At the transforming stage, the broad-based learning

community actively involves families, business, industry, and universities. The school is the center of the learning community, physically and virtually.

ICT in the curriculum

At the emerging stage, there are increasing courses and training of basic ICT skills in the curriculum. After that, there is an increasing use of ICT in various (but discrete) subject areas and isolated contexts with specific tools

At the infusing stage, the curriculum is infused with non-ICT content, authentic contexts and problem-solving projects. Subject areas are merged and ICT is embedded across the curriculum. At the transforming stage, ICT is accepted as a pedagogical agent and the curriculum can be delivered online and face-to-face in the virtual and real-time contexts. The curriculum integrates subject areas in real-world applications. ICT is taught as a separate subject at the professional level and is incorporated into all vocational areas.

Teaching and learning pedagogies

At the emerging stage, classrooms are still didactic and teacher-centered domination. At the applying stage, teachers use ICT for more specific professional purposes. ICT is integrated by teachers in acquiring specific subject skills and knowledge, changing teaching methods and using ICT to support training and professional development. Teachers are gaining confidence in specialized ICT tools that are applied to teaching. The opportunity to apply ICT in all their teaching is often limited only by a lack of ready access to ICT facilities and resources, which is why it is not fully integrated into all lessons for all students.

At the infusing stage, the classroom is shifting towards the collaborative learner-centered learning supported by ICT. Active and creative teachers are able to use ICT to manage the learning of both their students and their own to explore new ways to changes in personal productivity and professional practices. They integrate a range of preferred learning styles and uses of ICT in achieving their goals and assist all students in assessing their own learning

in achieving specific personal projects. This stage implies the ability to recognize situations when and where ICT will be helpful and choosing the most appropriate ICT to achieve a particular purpose. It is more natural for teachers to collaborate in solving problems and share teaching experience with others. At last, teachers are specializing in the use of ICT tools to create and transform the learning environment with pedagogies of critical thinking, informed decision-making, multi-sensory learning styles, experimental, etc.

Assessment

There are different objects for assessment in different stages. They are based on the characteristics of each stage of a different dimension of ICT integration in education.

Evaluation and research.

From emerging to applying stage, evaluation and research plan in the formulation and implementation of the ICT plan has appeared though no research can provide evidence-based policies. At the infusing stage, evaluation is both summative and formative, research provides evidence-based policies but does not push the boundaries of existing policies and practices as it does in the transforming stage.

However, this model has been developed for over ten years. As ICT is changing dramatically, it needs to be testified whether this framework of ICT integration in education is compatible with the current situation in Laos. Thus, based on these 10 dimensions and other literature, this study further categorized them into national level, community level, school level and added the individual level. They became the so-called ‘four ecological layers’ of ICT in Education in Southeast Asian countries. For school level, Bingimlas (2009) in his study examines ICT infrastructure (e.g., the condition of computers, internet connection, electricity supply and access to ICT-related resources and materials) to find out what could be the barriers to the successful integration of ICT in the learning and teaching environment.

For individual levels, education activities cannot happen without the participation of individual actors such as students, teachers (or PTs and TEs in teacher training institutes) and other stakeholders. In the report, ICT integration in Laos was considered to stay at emerging stage in all ten dimensions.

Although the report aimed to take a holistic view of the ICT integration in this region, the 10 dimension excluded the role of students at the individual level and the guideline and network at the global level. The purpose of the combination of using the two frameworks is to help ministries of education have to construct policy and pedagogical models and approaches of ICT integration for education based on this understanding.

Distance Education

Since 2002, UNESCO Institute for Information Technologies in Education (IITE) has commenced guiding educators of effective use of ICT to enable distance education. Interactive, electronic, and computer-based are the features for ICTs in the third generation of distance education. Its basis is to distribute information and facilitate communication between learners and teachers, and learners and learners. SEAMEO (2010) also claimed that it is through e-learning will ICT be integrated into all educational institutions from the primary level to the tertiary level. Therefore, teachers are ought to accept the innovations of ICTs which are replacing the traditional teaching and learning methods.

With the advent of tablet computers and smartphones, mobile learning, which is also a form of distance education, is regaining popularity in education development research seeking for the appropriate educational tools and material that enlarges access to education for all. UNESCO in its report 'Reading in the Mobile Era: A study of mobile reading in developing countries', also acknowledges the significance of mobile learning in developing countries as it not only enables basic communication but also provides possible solution to the old problem – the historical shortages of

teaching and learning materials in the least developed and remote regions (West & Ei, 2014).

2.3. ICT Integration in Teacher Education

2.3.1. Teachers and teacher education

This section answers the question about why we have to concern about teachers, teacher education, teacher training institutes (TTIs), pre-service teachers (PTs) and teacher educators (TEs).

Teachers have always been a focus of the GMRs of EFA since 2000. Quality teacher supply is one of the three overarching issues for the effectiveness of schooling (Brock, 2011). In shaping the post-2015 education and development agenda, stakeholders continue to take into account the critical role of teachers as the cornerstone of education equality, equity and quality. The role of teachers should be more emphasized in many developing countries as ICT-integrated education is still in its early stage (Khan, Hossain, Hasan, & Clement, 2012).

‘Teacher education and professional development’ is one of the five fundamental questions and themes that have been bearing on the quality and quantity of the teaching forces. Teacher training institutes (TTIs), where teacher education programs are provided, prepare PTs to adequately and effectively integrate ICT into future learning and teaching activities. Therefore, teacher training curriculum and programs should build them with the knowledge of good pedagogical practices, technical skills and content knowledge, as well as the relationships of these concepts (Koehler & Mishra, 2009) and it is important to identify their skills, knowledge and attitude to the use of ICT in education (Tezci, 2011). Teacher educators (TEs) are the main actors to train PTs to be qualified teachers. As the TEs’ lack of knowledge and skills could hinder PTs from effectively and actively integrating ICT in teaching activities, several researchers have seen the need to support TEs’ use of technology through workshops, easily accessible

consultants, and sharing of information (Clift, Mullen, Levin, & Larson, 2001).

2.3.2. Major Themes of Studies of ICT Integration in Teacher Education

Using a systematic review method, Jo Tondeur and his co-researchers (2012) reviewed 23 selected journal articles on Web of Science and identified 12 key themes (see Table 2) for content and delivery methods that prepare PTs to integrate technology into the future classrooms.

Table 2

Twelve themes for preparing PTs of technology integration

Key theme 1: Aligning theory and practice
Key theme 2: Using teacher educators as role models
Key theme 3: Reflecting on attitudes about the role of technology in education
Key theme 4: Learning technology by design (ISD)
Key theme 5: Collaborating with peers
Key theme 6: Scaffolding authentic technology experiences
Key theme 7: Moving from traditional assessment to continuous feedback
Key theme 8: Technology planning and leadership
Key theme 9: Cooperation within and between
Key theme 10: Staff development
Key theme 11: Access to resources
Key theme 12: Systematic and systemic change of efforts

However, these 12 themes are not always able to cover the diversity of ICT integration, especially in some developing countries. Here are a few more themes.

Early and life experience about ICT

In Table 2, attitudes and beliefs are considered the key theme of PTs' ICT integration. Ertmer (2005) thought further that personal experiences with technologies appear to have an influence on forming teachers' beliefs on applying technologies in teaching. Sam, Othman, and Nordin (2005) also pointed out that positive experiences to some extent contribute to the self-confidence on teachers' use of the Internet. Although we see in Garland and Noyes's quantitative study (2004) an inadequate relationship between computer experience and its contribution to computer attitudes, there is still

a demand for qualitative study to identify teachers' experience and attitudes toward emerging teaching technologies.

Linguistic issues and the effective use of ICT

Many developing countries are heterogeneous which may bring challenges to quality education. Some scholars claimed that language is one of the major barriers to the effective use of ICT (Sharma, 2003).

Knowledge sharing and online teacher community

A dean suggested that there can be collaboration among staff in a study aiming to investigate the main barriers and possible enablers for integrating ICT in pre-service teacher education programs in teacher training colleges in Turkey (Goktas, Yildirim, & Yildirim, 2009). The more competent in ICT should take their roles as models to transfer their experiences to the less competent.

A theme of teacher online community can be categorized under both theme 5 and 10. By conducting an empirical study, Hew and Hara (2007) adopted the theory of Community of Practice (CoP) to find out the online activities that teachers engage, the knowledge that is shared, the motives and the barriers of sharing knowledge. They agree with Schlager and Fusco (2003) who regard informal knowledge sharing in social networks as powerful catalysts for teachers to improve their professional practice.

The use of cutting edge technology to access to more ICT in teacher education

Korea is one of the countries that eagerly develop the educational technology. However, programs are more and more unlikely to prepare PTs with skills to deal with problems of complexity (So & Kim, 2009). In their study, Kim, Choi, Han, and So (2012) introduced a case of how the use of a newly developed software 'Scratch' can free the focus of teacher training from an explicit way of mastering programming language to a more implicit way which allows more focus on more advanced skills such as problem-solving, creative thinking, logical reasoning, etc. A conclusion is new

technology and newly constructed environment can free teachers from technophobia and make technology more convenient and effective.

Factors and variables of ICT Integration in pedagogical practices

The literature on ICT integration in pedagogical practices has overlapping themes with ICT in teacher education. However, it focuses more on the ICT-integrated pedagogical methods used in educational activities to verify the expected outcome of how well the methods work. It cares about the results, not teachers themselves.

First, there are personal characteristics of TEs which are probably the factors to impede or stimulate the innovative use of ICT (Drent & Meelissen, 2008). However, argued by (Albirini, 2006) that personal characteristics is only one of the five variables (computer attributes, cultural perceptions, computer competence, computer access, and personal characteristics) to teachers' computer attitudes which have a complex influence on their behaviors of integrating ICT in pedagogical activities. He further concludes that teacher's experiences with ICT, visions of ICT, plus the cultural conditions that surround its introduction into schools, do much to shape their attitudes toward technology adoption and to facilitate its subsequent diffusion throughout the educational practice.

Some studies argue against the opinion that ICT has little impact on promoting the quality of education (Luu & Freeman, 2011). They identify the relationship between education quality improvement and ICT integration and explain why people find it hard to see the educational outcome after 'integrating' ICT is because of teachers' insufficient, improper and ineffective use of ICT. In Yieng and Saat's study (2013) of using ICT in science instruction in Malaysia, they said that teachers' inappropriately use of computer software has a connection with students' weak ability to apply the skills of reasoning.

2.4. ICT and Teacher Education Development in Lao PDR

2.4.1. Country Profile

Lao People's Democratic Republic (Lao PDR or Laos) is the only landlocked country in Southeast Asia. It is still on United Nations General Assembly's list of the Least Developed Countries (LDC). In 1999, Lao PDR was at the bottom of all the ASEAN countries in terms of Human Development Index (HDI). However, based on the latest statistics, the country exits from the 'Low Human Development' category in 2015 and enters the team of 'Medium', ranking above Cambodia and Myanmar. It has a relatively young population and has potential in human development.

Human development is the process of enlarging people's choice and freedom. Defined by United Nation Development Program (UNDP), Human Development Index (HDI) is a summary measure of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable and have a decent standard of living. Therefore, people is the center of the human development paradigm. Education Achievement and International Integration are two of the indicator clusters of HDI. The former includes an indicator 'primary school teachers trained to teach' in 'Education quality' category. Despite 98% of the primary school teachers have received training, the result displays that Laos is still in the bottom half of the ranking. In index valuing international integration, there are indicators like 'Internet users' and 'Mobile phone subscriptions' in the 'Communication' category. By 2014, 14.3% Lao people were Internet users and mobile phone subscription reached to 67 per 100 people which increased 29.8% compared to the year 2009.

The latest 4th National Human Development Report of Laos (published in 2009 by UNDP) stated that MoES would continue on reform to improve universal education and vocational training. It also revealed a regional disparity in terms of HDI values. Luang Prabang Province ranked the 8th (0.40, compared to Vientiane Capital 0.7) among the 18 provinces of Laos.

2.4.2. An Overview of Problems of Education Development in Laos

There has been some literature about education problems in Lao PDR. The popular topics are about the urban-rural gap, under-qualified teachers, linguistic and cultural issues, low primary school completion rate, limited teaching and learning materials, funding and teacher incentives, etc.

Limited teaching and learning materials

Lao PDR lacks reading materials and many newly literate adults lose much of their proficiency after a few years (Holst, 2012). The 8th National Social-economic Development Plan (NESDP8) 2016-2020, introduces about a pilot project under the EFA program of implementing mobile teaching as to teach out of school children between 6-14 years old in remote areas of Savannakhet, Khammouane and Sekong Provinces. However, the lack of replenishment of the materials and continuous training for teachers still represents the main challenge.

Urban-rural gap and under-qualified teachers

The remote and mountainous areas in Laos are in short of secondary schools and qualified teachers. More than two-thirds of the secondary teachers do not meet the minimum qualification (Gannicott, 2009). Some domestic scholars in Laos claimed that the additional year of lower secondary education since the academic year 2009-10 might widen the urban-rural gap (Sengdeuane Lachanthaboun, 2008).

Language and heterogenetic

Many poorer nations of the world are extremely multicultural and multilingual. Even when schooling provision is available, its nature and effect vary enormously from one locality to another (Brock, 2011). In Laos, although teachers are usually the same or similar ethnicity with the students, communication and culturally appropriate education is limited. This challenges the training of advanced cognitive understanding and expression beyond mere linguistic capability.

Pedagogical methods

Vilaythong (2011) in the study presented how practical work and experiment were absent in the physical classrooms in Laos. Students were not actively invited by the teachers to participate in class. The instruction focused mainly on the theory other than practical work or experiment. Students were not given enough time to think or were not able to think due to the pedagogical methods.

Funding and teacher incentives

Lacking qualified personnel and sustainable funding and educational expenditures for teacher salary, schooling facilities and resources are the challenges to Laos' education development (Siharath, 2010). Some provinces are in need of new teachers but fail to attract teachers to come.

MoES provides monetary incentives for teachers (a 10% civil service bonus), but this cannot save the decreasing motives of pre-service teacher training graduates. Problems of not enough quality and quantity of teachers are heightened by many PTs who apply for positions in different fields after graduation, especially in rural areas. According to Korea Institute of International Economic Policy (KIEP), more than half of the students of TTCs are not willing to be a teacher (Chae & Chulwoo, 2014).

2.4.3. Context of Teacher Education Development in Lao PDR since 1950s

Despite a historical trend of progressive integration of teacher education within the higher education system, it requires delicate consideration to include teacher education into the history of higher education development in Laos due to the low qualification it once required, the short-term programs they provided and the low certification they issued.

Literature about the history of Laos' higher education also mentioned about teacher education which played a significant role in the evolvement of higher education. Keiichi and Siharath (2010) both talked about higher education development in Laos from a historical perspective. During the

French colonial period, higher education remained strictly limited as priority was given to the universal education. For a long time, the main function of tertiary level institutes was to train personnel for national administration and education. In 1958, the establishment of Royal Institute of Law and Administration in Vientiane marked the beginning of higher education in Laos. In 1964, National Institute of Pedagogy of Vientiane (NIPV) was established to produce qualified primary and secondary school teachers. In 1974, in order to fill the shortage of secondary school teachers, the government upgraded Normal School of Viengsay in Houaphanh Province into a higher institute. After Laos gained its final independence in 1975, NIPV and Normal School of Viengsay were combined into one: Higher Institute of Pedagogy of Vientiane (HIPV). It had two branches in Luang Prabang and Savannakhet Province adopting the 4-year program. There were around 2500 students enrolling in the main campus and about 400 students in each branch school. Since then, the communist Laos had received a substantial foreign aid from the Soviet Union and other Eastern European countries until the 1990s.

In 1988, HIPV was renamed into University Pedagogical Institute (UPI). It was one of the three institutes with tertiary education level at that time. After that, UPI was under fundamental reform with aid from ADB. In the early half of the 1990s, comparative education about higher education appeared. Nussbaumer (2012) introduced about modern history and reforms of higher education of Vietnam, Laos and Cambodia. However, no comparative analysis was conducted in the study.

Two articles of John C. Weidman brought us close look at the development of higher education in Laos until the late 1990s. He discussed reforms and what strategies UPI should take after the founding of National University of Laos (NUOL) in 1996. He revealed the fact that for teachers who were trained in specialized pedagogical institutions for primary and secondary education, the majority of them received instructions that would

not be considered to be at the tertiary level. Most teachers had completed only the level of education immediately above the one at which they were teaching and the duration of programs were usually less than three years providing diploma or medium certificate. Worth mentioned, before it was broken down by the financial turmoil around 1997, teacher training was controlled by the ‘quota system’ which the government will provide the scholarship to hire ‘quota teachers’.

In order to steadily access to quality primary and secondary education, MoES implemented the Second Education Quality Improvement Project (EQIP II) and Teacher Training Enhancement and Status of Teachers (TTEST) in collaboration with ADB and Sida who provided financial resources to develop a teacher training support system until 2010. These were the dominant ODA projects in teacher education in Laos. By the end of the projects, 105 PTs graduated with master degrees. Teacher Education Strategy and Action Plan (TESAP) was also the achievement of the projects.

In 2008, officers from the Department of Private Education Management of MoES presented a report to the 2008 Conference Macao SAR, China to introduce the current situation of higher education in Lao PDR. The report categorized all the higher education institutes into three types: institutes of national university level (4), teacher training institutes (5) and private higher institutions(Xaysomphou, 2008).

2.4.4. ICT Development in Lao PDR

For this part, literature draws a context of ICT development in Lao by answering the question ‘In which ICT development stage is Lao PDR and what does the latest policy reflect on it?’ This is also the questions suggested by Asian Forum in 2003 that all government should assess and be clear before making the policies (Monstad, 2004). The Internet and telecommunication services are the two areas being focused on.

Despite the contribution of ICT industry on economic growth, it struggles to escape from the fact that Laos is still at a low stage of ICT development.

Digital gap between urban and rural areas remains huge. As reported by the latest population and housing census (2015) of Laos Statistics Bureau (LSB)¹, an average 86% of households owned a mobile phone while 94.7% of urban household and 68.7% of households in the rural area without roads. 24.5% of the urban household owned computers and the number dropped to less than 5% in rural areas. By 2014, only 14.3% of the population were Internet users. Mobile phone subscription was 67% which grew 29.8% comparing to 2009.

In retrospect, the national master plan for telecommunication development was published consulting with the Japanese International Cooperation Agency (JICA) after entering 2000s. It emphasized on how human resources should be trained to support the development of this field. In March 2003, International Telecommunication Union (ITU) published the earliest report of situation, problems and challenges of Internet and telecommunication in Laos. It first argued that affordability was not the reason for low penetration of the two indicators. Evidence showed that there were estimated at least 135,000 urban households being able to afford telephone service, while only 33,500 registered for the service. It also discussed ICT's penetration into four social sectors which included education. At that time, fewer than 4% of Laotian households had telephone and only urban areas in half of the provinces were covered by the mobile cellular signal. To transform the situation, Sayo et al. (2004) proposed 10 priorities areas where ICT policies and e-strategies should focus on. It recognized the potential contribution of academic institutions and educational system to ICT development but didn't take education's independent role into account.

Internet

¹ Link: <http://www.lsb.gov.la/en/index.php>

Internet was first introduced in Laos in 1997. Since 2008, Internet use has increased significantly because of the introduction of mobile broadband. However, Laos' domestic statistics of 2012 showed that internet users of Laos only took up 10.7% of the population. The country is still in the list of LDC in ITU's 2016 statistics where internet penetration is less than 20% of the population. The statistics also reveal that internet price in LDC is the highest of the world and mobile broadband is cheaper and faster the majority of fixed line service.

In 2015, the Deputy Director General of LTC presented about the trends for mobile application of Lao people among which included education. He showed a positive attitude to the growth of mobile broadband of which the key factors included the provision of more converged and affordable devices to customers and the establishment of a pleasant online virtual community for Lao people. In a chart he used to introduce the most popular websites for Lao people, Facebook ranked the top while 90% of its users from were between 15-34 years old. YouTube and Google.la came at the second and third place (Google.com ranked the fifth and Google.co.th the 7th). It indicated that Lao people were using multiple languages to search for information online.

When all evidence seems to regard mobile telecommunication and broadband as the future direction, statistics of The Ministry of Communication, Transport, Post and Construction (MCTPC) rebut this assumption. Figure 2 shows that the increment of subscription of the mobile cellular telephone is not straight which was distorted in the year 2011-12. The upward trend of internet use is also increasing at a very slow pace.

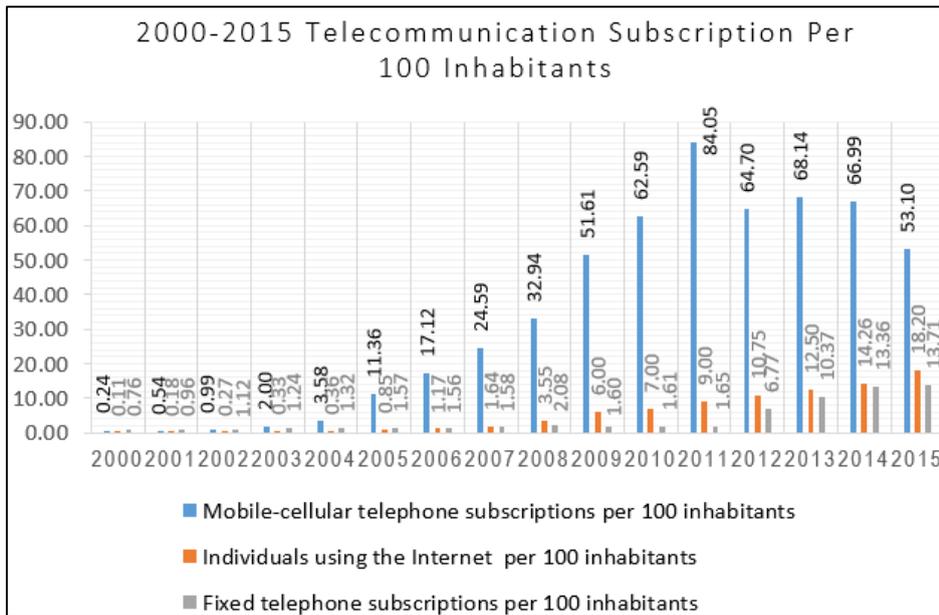


Figure 2 Telecommunication subscription per 100 inhabitants (2000-2015)

Policy

In connection with the 8th National Social-economic Development Plan (2016-2020), the government aims to promote local innovation and utilization of science, technology and telecommunication and management and application of ICT. It encourages all areas to use ICT as a tool for the facilitating their operation and private investment of both domestic and foreign in the telecommunication sector. To narrow urban-rural gap, it plans to establish learning centers on for ICT in 15% of total village clusters by 2020. At the same time, it expects that ratio of Lao population with knowledge of computers and the Internet should reach 20% and 25% of the population by 2020 respectively. These targets, without doubt, require according supports from education sector which could equip the Lao citizens with necessary ICT literacy and skills.

ICT integration in education institutional dimension is followed by Education Conceptual Framework (2009) (Figure 3) and the new Education Development Strategy (2009) and ICT Project Phase I (2010-2013). The first one confirmed ICT's role in education development in Laos; the second one

stated two strategic directions for ICT integration in education is E-Education (including e-learning and e-governance) and Distance Education (emphasized in 2014). In May 2013, ICT Centers for Education and Sports was established under the organization structure of MoES. It is undertaking all ICT in Education development tasks within the education sector and supports all ICT facilities and systems for Lao education. It is also responsible for formulating policies and strategic planning in the management and monitoring ICT resources.

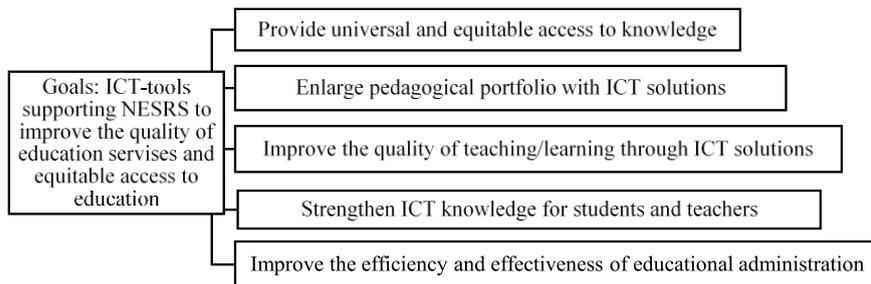


Figure 3 Lao ICT in Education Conceptual Framework (2009)

Multi-level and interrelated international cooperation also contribute a lot to the integration. From April 2012 to April 2016, education and research institutes of tertiary education in Laos were the beneficiary of the Trans-Eurasia Information Network 4 generation (TEIN4). Linking local scientific research and training organizations with regional and international networks, TEIN4 is a unique Research and Education (R&E) collaboration which provides dedicated large bandwidth, high-quality Internet international connectivity between R&E communities in its covering region. It develops infrastructure for a high-speed information network to serve the purposes of scientific research and cooperation between Asian and European countries. Although the whole project of connecting Laos to Thailand is still under construction and testing, it is no doubt that TEIN will not only strengthen cooperation and international integration of Laos in the tertiary education field but also contribute to the country's industrialization and modernization process.

2.4.5. Teacher Education Development in Lao PDR

Ministry of Education and Sports (MoES) is a central governmental organization playing an essential part for human resource development to educate Lao people to be good citizens, to have a revolutionary and moral behavior, knowledge, skills, and good health. Department of Teacher Education (DTE, the other translation is Department of Teacher Training) is the functional unit within MoES taking direct charge of all 16 public Teacher Training Institutes and the management of teachers.

It has been a long journey for Lao PDR to lengthen the duration of compulsory education and teacher training programs. It did not realize a full merge of integrating teacher education into the higher education system until the 12+4 teacher training program is commonly established in TTIs. Due to the trend of combination around 2000, the number of teacher training institutes reduced from 59 to 10. In 2016, according to DTE² of MoES, there are 16 public teacher training institutes nationwide (see Figure 4).

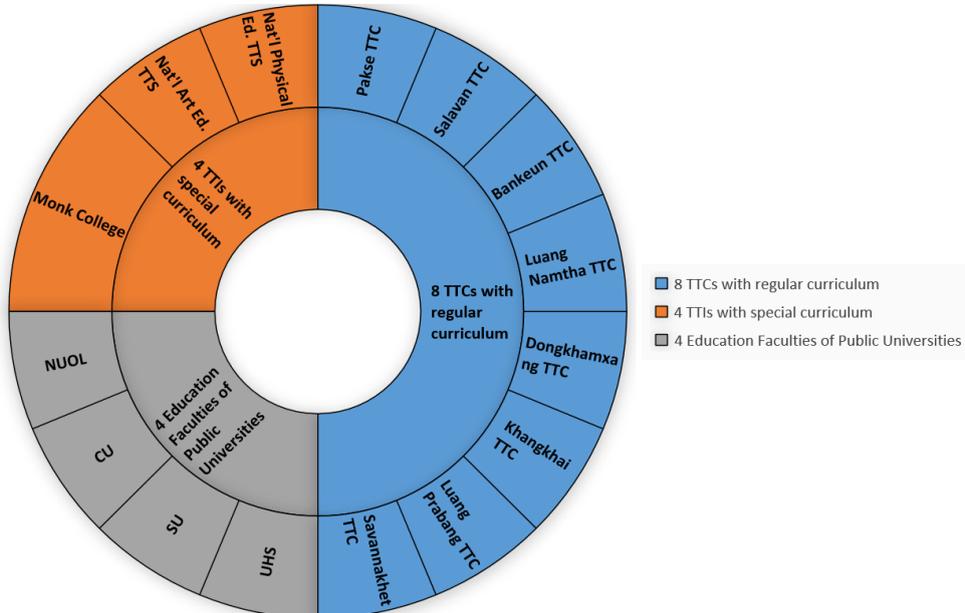


Figure 4 Sixteen Teacher Training Institutes which provide tertiary level Programs in Lao PDR (2016)

² Link for downloadable resources on the website of DTE of MoES: <http://www.temis-moes.gov.la/index.php?slmenu=frmPresentation.php>

Teacher qualifications in Lao PDR

Programs provided in TTIs change over time depending on the actual quota and enrollment of each academic year. So does the qualification. For the most common situation in Laos, teacher qualification is measured by two criteria: years of formal schooling and years of teacher education (Gannicott, 2009). It can be seen in Figure 5 that in 2008, when the lower secondary level had not extended to 4 years, MoES endorsed 5 types of accredited teacher training systems (Sengdeuane Lachanthaboun, 2008).

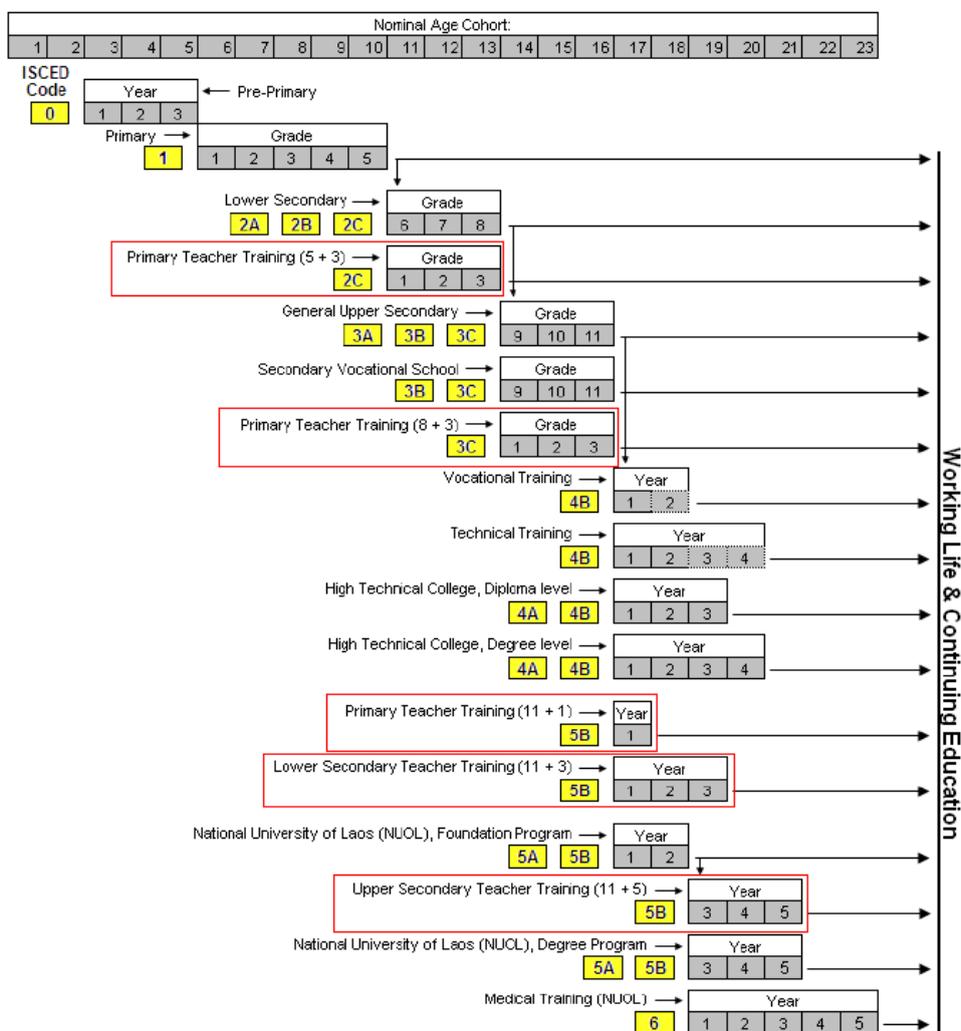


Figure 5 Education System in Laos in 2008

Source: National Report of Development of Education, Lao PDR (2008)

At present, the official requirement for teaching in secondary school has changed from a minimum of 11+3 (11 years of formal schooling and 3 years of teacher education) to the common 12+4. To be a PT in a TTI, one must complete the secondary education. However, students from remote areas are exclusive from this requirement. Admitted through governmental quota, the majority of these disadvantaged students have only a primary or lower secondary education background.

2.5. The Existing Studies on ICT Integration in Teacher Education in Lao PDR

For this section, this study selects a doctor thesis and a series of work of Mr. Maaly Vorabout to make a critical review. Both have significant implication in this study.

Chounlamany and Khounphilaphanh (2011) wrote in their doctor thesis for Umeå University about the new teaching methods in NUOL and three TTCs (Luang Prabang, Savannakhet and Pakse) in Lao PDR. The new methods were defined as student-centered pedagogical methods which can enable the shift of classroom from ‘lecture-based to activity-based education. It took the stance of ‘Education being a primary target for the revolutionary process since the goal was to spread information about the revolution and to create new socialist citizen.’ Although policies promised to delegate autonomy to teachers to use the new methods to teach, there claimed to be no content of the curriculum exists. Teacher educators are confused about what the new methods really are and feel helpless and unconfident without necessary guide from the top. The thesis, however, focused on non-technological pedagogical methods and excluded the discussion about ICT as new method in promoting student-centered learning, communicating and interaction among PTs and TEs in class. Only two parts of the thesis slightly mentioned about ICT. The first part was quoted from the written reports of a psychology teacher educator sharing her negative opinion on using computers to finish the assignment. She said she required her students (pre-

service teachers) to handwrite their reports to avoid ‘copy and paste’ from the internet and among themselves. The second part was a citation of MoES’ 2006 official report on the default of pre-service curriculum which could not ‘meet current needs’ and ‘there’s a lack of correlation between curricula of teacher education and general education’. To deal with it, MoES stated that in ‘the information era, and a scientific and technological revolution’, curriculum should be flexible and reinforce the integration of new important world issues and appropriate educational topics’. From the aspect of educational administration and management, MoES also mentioned of problems like insufficient technical skills of staff, inadequate information, poor coordination and communication and absence of decisive leadership at the department level. Therefore, despite government’s emphasis on ICT’s role in education, it is surprising to find no discourse of ICT integration in this thesis talking about new methods for teaching. Has not ICT Integration in Teacher Education ever existed? Or they think using ICT for a pedagogical purpose is not a new method of teaching? From the interview scripts, ‘*textbook* serves as a primary source of information for PTs writing reports’ and ‘the reports are most often mainly based on information from the textbook’ and ‘the PTs search for and follow the information on the textbooks’. Then, how much the situation would have changed after six years of technology progress? Do PTs in TTC learn and have the ability to search for information beyond the textbooks? Are they given the agency to access to information by using ICTs in 2016? Or they don’t take it for granted that ICT in the education context of Laos is not able to facilitate information accessing, processing, sharing and transmitting? These are the questions proposed by this study based on this doctor thesis which was published five years ago. They are answered in the finding chapter with empirical evidence found in the study.

Situation of ICT Integration in Teacher Education

How does Lao PDR try to move forward in ICT integration in teacher education? It would be hard to find someone who knows better than Mr. Maaly Vorabouth. He is the current deputy director of the Education Statistics and Information Center and the former director of the Teacher Education Evaluation Division (TEED) for Teacher Education Management Information System (TEMIS). He has been working for MoES for around 20 years and has an expertise in ICT development, mathematics education and teacher education of Laos for over 30 years.

Mr. Maaly underlined three aspects of ICT integration in Lao education: ICT pedagogy, ICT experts and methods to improve English proficiency. Teachers are required to equip themselves with ICT skills and pedagogy is to fit the ICT integrated secondary curriculum. English, mathematics and science education were the three major subjects that ICT pedagogy was used in. These ICT pedagogy practices were promoted by projects such as SEAMEO's RECSAM, Sida's EQIP 2 and TTEST and Naruto University's SMATT. Tape recorder, television, video, slider, projector, video camera and computer were the techniques used by TEs in the TTIs.

He commented that teachers appeared to have to different stages in teacher professional development about ICT. They first begin to understand the effective use of the ICT in teaching and learning and then to use ICT to teach. He added that TEs had started to use computers to create lesson plans and teaching materials. However, this only covered emerging and applying stage and he didn't mention about the role of mobile phones and how PTs in the TTCs learned with and learned to teach with ICTs. He considered it as a good beginning for Lao students although ICT had not integrated in learning so far. Therefore, the question 'What role does ICT play in PTs' learning?' got the inspiration from this presentation.

He pointed out several challenges: (1) substandard and old model machines; (2) sufficient budget for maintenance and operation; (3) not available spare parts for repair, (4) no access to electricity in some remote

areas; (5) lack of human resources in ICT field (6) uncertain behavior and attitude of ICT integration in learning and teaching due to the fact that many teachers have never seen high technology before; (7) teachers lack of an understanding of ICT pedagogy integration and in-depth understanding of the subjects; (8) not known how far Laos can achieve ICT integration in learning and (9) insufficient English skills.

Mr. Maaly has always been a major promoter of researches about Lao education. He also contributed a chapter in the book ‘The State of Use of ICT in the Teaching and Learning of Science & Mathematics Among Schools in SEAMEO Member in 2010. He mentioned that in secondary schools, science teachers mainly used the internet and a computer with LCD projector for teaching. Some of them use their personal laptops and specific software in teaching. Some secondary school students in urban areas also used Microsoft Word and Excel for the purpose of computer literacy.

It is worthy to note a case study about how Japanese volunteers help in-service teachers in Laos (Holst, 2012) to make more communicative and student-centered classroom. The author admitted that English proficiency and computer literacy have become the key competencies which open up a greater number of career possibilities and provides clear instrumental motivation for young Lao people.

To conclude, ICT integration in teacher training in Laos has witnessed increasing coordination and cooperation between MoES with domestic and international development partners. However, they have not been transformed into a research behavior. Additionally, no research has been done from the third party perspective to look into this topic.

CHAPTER III. Research Methods

This study conducted a mixed methods approach (semi-structured interview, field observation, database analysis, literature analysis and a small scale survey) to draw a comprehensive description of ICT integration in Luang Prabang Teacher Training College (LPB TTC).

3.1. Procedures

At the beginning of this study, instead of directly turning to scholarly literature and documents to identify a research problem, the researcher firstly decided on a region (south-east Asia) and a theme (ICT integration in education) based on personal concerns in global education development field. Then, she made use of quantitative and qualitative methods to determine the focus of research. After an overall consideration of preliminary data such as statistics, collected documents statement and online interviews with Lao teacher educators, problems were identified in teacher education, research questions were decided and a case study as qualitative research method was finally conducted.

3.2. Why not Quantitative Study?

Quantitative research is ‘Explaining phenomena by collecting numerical data that are analyzed using mathematically based methods (in particular statistics)’ (Aliaga & Gunderson, 1999). Here are some examples of quantitative inquiry which are capable of describing the situation to answer the research question ‘How has ICT been integrated in LPB TTC?’:

- Number of PTs who possess mobile phones and laptops/computers;
- Number of TEs who use computers to prepare courses;
- Times of TEs using projector to teach in class per month;
- Number of PTs who take photos as notes in class;
- Number of photos that PTs take in the same class;
- Average time that student PTs/TEs spend on social networks and communication apps;

- Number of online groups that student PTs/TEs are in;
- Languages that PTs/TEs have no difficulties to type with;

Before data collection, the usefulness made quantitative inquiry the main research method of this study to understand and explain the situation of ICT integration in LPB TTC and to quickly identify the variables and problems. However, this study finally chose qualitative approach instead based on the following three reasons:

First, Internet infrastructure and students' ICT skills are the barriers to conduct online survey in an environmentally friendly way. It was originally planned to design questionnaire and ask teacher educators to arrange students to finish in ICT courses. However, a teacher educator in LPB TTC said he was not sure if the campus Internet was fast enough to support the online survey. Meanwhile, sending the link to individual PT through their personal mobile devices was not a practical solution in the local context either. PTs' ICT ability and ICT facilities possession differ from one person to the other. Although high valid response rate has always been preferred in quantitative study, in this context it may indicate to exclude the unreached group with difficulties to access to proper ICTs.

Second, this study didn't use paper questionnaire for survey because it required delicate design considering participants' thinking habit, inconvenience and discomfort. If not, participants would not comprehend questionnaire questions easily and individually. As little literature talks about what kind of person the Lao teachers and students are and what should be kept in mind during the survey, there needs a study to adopt a qualitative approach to get closer and gain rapport with the local people first.

Last, due to the complexity of ICT integration in teacher training institutes, quantitative method will find it helpless to include all variables and hypothesis which cannot be directly tested by collected data. It makes some important variables related to family and various social-economic and social-cultural features hardly possible to measure.

3.3. Choosing Luang Prabang Teacher Training College (LPB TTC) as the Case: Sample Details and Rapport

A case study research involves the study of a case within a real-life contemporary context or setting (Yin, 2013) through detailed, in-depth data collection involving multiple sources of information. The case is within a bounded system, bounded by time and place (Lewis, 2015).

The reasons of choosing LPB TTC as the case are threefold. LPB TTC has the most complete database among 8 TTCs and is assumed to show clearer evidence of ICT integration in teacher education. Second, its quota to enroll PTS is relatively higher than the other TTCs which can better reflect the diversity of Lao population. Third, the access to LPB TTC is the easiest for researcher. Lastly, for a single case, it is easier and less complex to tell on which stage the ICT is integrated into a specific teacher training institute. Accordingly, LPB TTC is not a country case and could not simply represent all situation of ICT integration of Laos. Nevertheless, from a developmental point of view, as it has more experience in teacher training, it can be a good example for other TTIs of its achievement and challenge.

3.3.1. Researcher as an Outsider

The role of researcher in this study was a nonparticipant i.e. observer as participant. The researcher is an outsider who does not participate in any activities that are observed, except watching and taking notes of the classes and school operation from a distance with no intervention.

3.3.2. Characteristics of Participants and the Selection

Participants in this study should be actors in the learning and teaching activities. As a result, PTs and TEs were selected as participants through purposeful sampling by a staff member of LPB TTC. The study also selected another two characters who have significant influence on ICT integration in teacher education in Laos.

Teacher educators (TEs) are those who teach PTs with the aim of supporting their professional development (Lunenberg, Dengerink, & Korthagen, 2014). However, what has often been overlooked is the role of TEs in the teacher education enterprise (Boyd, Harris, & Murray, 2011) as program structure, organization, expectations and purpose have tended to dominate. The term ‘teacher educator (TE)’ in this case, refers to member staff who teach in the LPB TTC. And Pre-service teachers (PTs) are students enrolling in the current regular semester programs.

A total of 32 participants contributed to data collection of this study, among which there were 20 PTs, 10 TEs, 1 official of MoES and 1 staff of e-lesson developing team of IT Center of NUOL. Only 4 PTs and 2 TEs were female. The age of PTs was ranging from 19 to 24 and for teacher educators, 25 to 43. The study conducted interviews and a survey with 8 TEs; a meeting with the four directors of each department (who were not counted as participants as the collected data were general information of the department which were used to confirm the data from the online database.

3.3.3. Class Observations Selection

As only few of the classrooms installed ICT equipment and not all the TEs prefer to use ICT in their courses, class observations were selected based on TEs’ recommendation which would be easier for the researcher to identify ICT integrated activities. I asked for permission about in which courses the TEs might feel comfortable to allow me sitting in the back of the classroom to keep records of their classes. For this study, three class observations of totally 6 course hours were conducted.

3.3.4. Access and Rapport

First, to gain permission to the research site, this study was approved by the Institutional Review Board (IRB)³ on July 22nd 2016. From September 5th to 9th, the researcher contacted and discussed with the school about the

³ Approval Document of Institutional Review Board (IRB) see Appendix 9-1

appropriate time to visit. Then, a letter of permission request attached with terms of reference including the visiting schedule⁴ was sent to MoES of Lao PDR by e-mail. This study was approved by MoES⁵ on September 22nd 2016 to conduct field research in LPB TTC from September 26th to 30th, 2016.

Second, consent forms were signed by 32 participants individually. After being notified, the school arranged three staff members to be responsible for the research visit. One was in charge of re-scheduling interviews and class observations based on practical situation, one helped on data collecting and validating and one helped in interpretation in the interviews.

3.4. Data Collection

Kay (2006) found that the research methods used in the vast majority of studies of technology integration in pre-service education had severe limitations, such as poor data collection instruments, vague sample and program descriptions, small samples, an absence of statistical analysis, or weak anecdotal descriptions of success. Thus, this study aims provide detailed and descriptive data to show how ICT is integrated in teacher training colleges in Laos.

3.4.1. Semi-structured Interview

This study conducted 8 group interviews and 22 individual interviews with totally 32 participants, each took about 20 minutes to 60 minutes (see Table 3) to extract learning and teaching experiences and life stories with and about ICT. These two forms of the interviews were chosen depending on how many participants were arranged to join the interview at one time and how they are required to answer the questions. English was mainly used in the interviews. When a participant could not understand the question or found difficulties in speaking in English, a TE with fairly good English proficiency and was once trained by UNESCO APCEIU in Korea helped

⁴Terms of Reference – Visiting Schedule see Appendix 10

⁵ Approval Document of Ministry of Education and Sport (MoES) of Laos) see Appendix 9-2

with interpretation. She took a non-participant role the same as the researcher. All interviews were conducted in campus setting: 23 interviews in the meeting room in administration building, 4 in an empty classroom and 3 in the offices of the participants.

In group interviews, participants were invited to provide either individual or collective responses to questions or themes. Individual responses would be heard by other participants at present. Only those which were agreed by the other participants through gesture or words would be counted as valid individual responses. Group responses were the products of group discussion. The participants generated sidebar conversation in their official language Lao before they came up to the final response. The time that spent on group discussion ranged from 5 seconds to around 1 minute. Longer time consumption usually implies 1) diverse opinions and 2) being not familiar with or not able to recall the content of certain topics.

In individual interview, questions and topics were proposed in a freer style. Take interviews for PTs as the example. Participants were usually asked to start with telling their life stories, their hobbies and interests. After that, they were invited to share their first experience or training experience of ICT. Then, they were asked to talk about learning activities in LPB TTCs. They could describe what kind of activities they have about ICT and their attitudes towards their experiences. They were also encouraged to talk about their expectation and dream for the future although not all of them preferred to share.

Table 3

List of participants and interviews

No.	Name	Gender	Department	Language	Form
<i>Pre-service teacher (PT) participants</i>					
1	NTI	F	Basic ICT Edu.	En	G ₁ +I ₁
2	Somphone Phonpaseyth	M	Basic ICT Edu.	En	G ₁ +I ₂
3	Noy Xaiyaphon	F	Basic ICT Edu.	En	G ₁ +I ₃
4	Tearnoy	M	Basic ICT Edu.	En	G ₂ +I ₄
5	Joy	M	Basic ICT Edu.	En	G ₂ +I ₅
6	Phone Saypor	M	Mathematics Edu.	En	G ₃
7	Bounniaw Lor	M	Mathematics Edu.	En	G ₃ +I ₆
8	Chorlee Nengyakhoualee	M	Mathematics Edu.	En	G ₃ +I ₇

9	Khamphay	M	Mathematics Edu.	En	G ₃
10	Kou Vangmoua	M	Chemistry Edu.	En	G ₄ +I ₈
11	Vandy	M	Chemistry Edu.	En	G ₄
12	Phonexay Chanthasuck	M	English Language Edu.	En	G ₅ +I ₉
13	Korher Lercher	M	English Language Edu.	En	G ₅ +I ₁₀
14	NTI	M	French Language Edu.	En	G ₅ +I ₁₁
15	Porvue Chandeevue	M	French Language Edu.	En	G ₅ +I ₁₂
16	Ting Xaiyasouk	F	Preschool Education	Lao	G ₆ +I ₁₃
17	Seathong Lor	M	Primary Education	Lao	G ₆ +I ₁₄
18	Miss Moun	F	Primary Education	Lao	G ₆ +I ₁₅
19	Kou Vang	M	Lao Language Edu.	Lao	G ₇ +I ₁₆
20	NTI	M	Lao Language Edu.	Lao	G ₇ +I ₁₇

Teacher educator participants

21	NTI	M	Chemistry Edu.	Lao	G ₈
22	NTI	M	Physics Edu.	Lao	G ₈
23	NTI	F	Math Edu.	En	G ₈
24	NTI	M	English Language Edu.	En	G ₈
25	NTI	M	French Language Edu.	En	G ₈
26	Ms Soudavanh	F	Social Science Edu.	Lao	G ₈
27	Mr Mountee	M	Lao Language Edu.	Lao	G ₈
28	Mr. Joe	M	ICT Edu.	En	G ₈ +I ₁₈
29	Mr. Sithisack Manipoun	M	ICT Edu.	En	I ₁₉
30	Nang Somephet	F	ICT Edu.	Lao	I ₂₀

Administrator participants

31	Mr. Maaly	M	Education Statistics and Information Technology Center of MoES	En	I ₂₁
32	Mr. A. Thephavongsa	M	IT Center of NUOL	En	I ₂₂

**NTI represents 'Not to Identify'; G, I and G+I represents, in order, group interview, individual interview and group and individual interview.*

3.4.2. Observation

This study conducted a non-participatory observation to collect field data from the site. This type of observation, according to (Liu & Maitlis, 2010), is often used in tangent with other data collection methods, and can offer a more "nuanced and dynamic" appreciation of situations that cannot be as easily captured through other methods. Furthermore, limited by language barriers and time shortage, this study was not able to transform into a participant observation blending with the site.

There were three stages of this study. First, to get an overview of the school setting, the researcher carried out a broad scope of descriptive observation. A campus map and the description of 'hard environment' for ICT integration in LPB TTC was the outcome of this observation. During

the campus trip, as the researcher got more familiar with the campus site, she moved to class observations which allowed her to get closer to the targeted participants of this study. In this stage, she stopped by 6 classes (2-5 minutes each) and generated a more concrete idea of what activities would be carried in the final stage: selected observation. This study also selected 3 full lessons to observe which lasted 70 to 90 minutes depending on the TEs (see Table 4). All lessons were given by local teachers in Lao language.

Table 4

List of class observations

Course Name	Code	Date	Place	Methods remarks
Lao Language Pedagogy	O ¹	27 th	General classroom type 1	Full lessons;
Teaching ICT	O ²	27 th	General classroom type 2	Photos;
Education Management	O ³	27 th	General classroom type 2	text notes
Software application	O ⁴	26 th	PC Lab	Photos;
Pedagogy of Lao alphabets and phonetics	O ⁵	26 th	General classroom type 1	Interview with TE
English Listening	O ⁶	26 th	Language Lab	Text notes
Number Theory	O ⁷	26 th	Library	Photos;
ICT Extra-curriculum	O ⁸	27 th	Library	Interview
Chemistry	O ⁹	26 th	Chemistry Lab	with ST

The field materials collected for the observation took three forms. First, site photos were taken to make an instantaneous record when TEs initiated a new activity, shifted a topic or when PTs had new actions. Different from photos, 3 pieces of sketches for full lesson observation were made to record the overall data about classroom settings and activities within the course time. These sketches kept information of TE's active area, students' behaviors with ICT equipment and relative position of classroom furniture and facilities which photos were not able to show. Lastly, text notes were made to provide extra description to fulfill the gap between the real situation and the collected data. During the observation, no video or audio recordings were made.

3.4.3. Online Small Scale Survey (English) for Teacher Educators

The online questionnaire powered by Survey Money was distributed to 8 TEs through Messenger in the group interview. On one hand, this survey aimed to grasp a general view on TEs' ICT skills, their wiliness and habits to teach supported by ICT and their attitude about ICT environment construction and maintenance, etc. 5 questions were structured based on the Sida's survey of tutors' knowledge and use of ICT in teacher education colleges in Tanzania (Andersson, Nfuka, Sumra, Uimonen, & Pain, 2014).

The link of the survey was sent to the group chatting room in Messenger powered by Facebook. TEs were asked to mark stars in the survey to show the level of five-scale agreement to the statement.

3.4.4. Anonymous Memo Writing Activity (AMWA) about Sensitive Topics

This study designed an anonymous memo writing activity for participants to give responses to a common topic in group interview. It required participants' sensitive or private information which might be better to kept as secret from their colleagues or classmates. The one used in interview G₅ was coded as AMWA₁ (self-evaluation of your computer skills) and the result is presented in page 100. The one used in interview G₈ was coded as AMWA₂ (the ratio of monthly salary to the affordable price of computer) and the result is presented page 62.

3.5. Data Analysis: Coding and Analytical Framework

3.5.1. Transcribing Tools and Stories

InqScribe Version 2.2.1 was used for transcribing. Important intervals and repeats were also included in the transcripts as minor analytical data. After that, based on the transcripts, narrative stories for individual interviews and the third-person narration for group interviews were made.

3.5.2. Analytical Framework

In the next chapter, data will be organized and presented in five sections, to seek the four stages of ICT integration in teacher education in Lao PDR at five levels: global, national, community, school and individual level.

At the national level, the study looks for ICT in the country's educational policies and strategies, the condition of nationwide Internet service and the major practices which follow the national guideline.

At the school level, the study looks at the school environment which all activities are blended in, the ICT infrastructure and ICT organization structure which reflects on human resource that support and the ICT integrated curriculum that guides the learning and teaching activities. Then, it identifies skills that which involve the application of ICT. It also points out the fact that ICT has been utilized to create teaching and learning materials (both in traditional form and electronic form and to improve pedagogical methods for being a platform of knowledge making, transferring and sharing.

Then, the study moves to the third section to talk about actors at the community level which have influence to the local teacher education in reference with ICT: training in ICT/computer centers, computer courses in secondary schools and online teacher community.

In the fourth section, the study puts emphasis on individual TE and PT to see how their first experience, the purpose and outcome of daily use of ICT products and future plans/dreams may influence the teaching and learning at LPB TTC.

In the last section, the study asks further about what did the global partners of LPB TTC do about ICT, what infrastructure they helped implement and what projects they had conducted and for what.

CHAPTER IV. FINDINGS

4.1. ICT Integration in Teacher Education at the National Level

4.1.1. Emerging Stage: ICT Integration in National Policies and Strategies

MoES has not formulated any centralized policy of ICT in pre-service teacher education yet. However, it is addressed in several official documents.

First, in the Sixth National Social Economic Development Plan (NSEDP) 2006-2010, human capital was prioritized as one of the four main areas for promoting human development. Later, Teacher Education Strategy 2006-2015 and the Action Plan 2006-2010 (TESAP) was endorsed by MoES in 2006. According to TESAP, the Lao Government wanted to improve the quality of teachers through longer periods of pre-service teacher training. It aimed to ensure continuous and systematic upgrading for in-service teachers to become highly skilled teachers.

In 2007, the National Education Sector Reform Strategy 2006-2015 (NESRS) expected to establish the new national education system which extended the 11 years of schooling to 12 years (from 5+3+3 to 5+4+3). Besides, ICT curriculum along with ICT labs would be established. They were implemented in the academic year 2010-11 (for lower secondary) and 2011-2012 (for upper secondary). The use of ICT (TV and radio supported distance education program) was also encouraged to give chances for people in remote areas. Since the implementation of ICT project for improving secondary education, People's Republic of China has been supported the construction of model secondary schools in each province. These schools will be linked with the ICT Centre at MoES in Vientiane.

ESDF is the expansion on the NESRS covering the sector-wide development of general education from 2009 to 2020. It includes an intervention under the quality component to introduce the knowledge of ICT into the lower and upper secondary education level. It also sets up a phased implementation plan for ICT secondary curriculum development for

secondary schools and for integrating ICT skills in the pre-service teacher training program. Since then, the need to integrate ICT in pre-service teacher education curriculum has grown greater than ever before.

Figure 6 shows how Mr. Maaly Vorabouth positioned ICT centers of TTCs in the structure of nationwide ICT Centers in his presentation at Global Education Technology Summit in Kuala Lumpur, Malaysia in 2008.

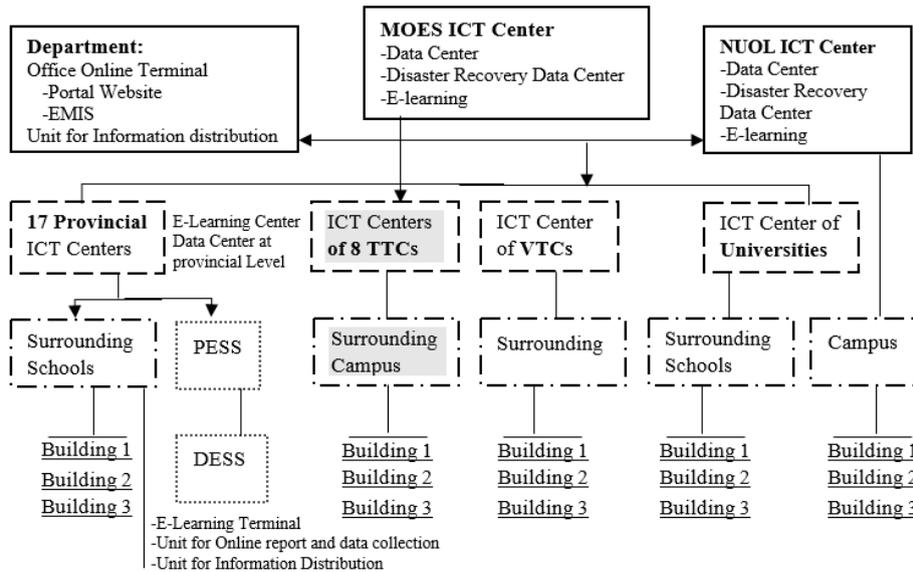


Figure 6 ICT Centers: structure and functions

In 2008, there were 294 personal computers (PC) in the eight TTCs, 150 of which were used for learning and teaching. It meant that each school would only be distributed with less than 20 PCs in average (far smaller than the regular class size). For internet coverage, except LPB TTC and Savannakhet TTC whose LAN connection covered the whole campus, other TTCs had internet only inside of the computer labs with limited bandwidth (maximum 256 kbps; minimum 54kbps).

4.1.2. Applying Stage: Internet Service at the National level

The connectivity, accessibility and quality of the national Internet infrastructure affect the ICT integration in teacher education. Internet fee is exorbitant in Laos. Table 5 shows that Lao telecommunication is over 20

times more expensive than the one in Vietnam for fixed line fiber service, and the fee for mobile broadband is two times more than Vietnam.

Table 5

Internet fee of major ISPs in Lao PDR and Vietnam

Country	Operator	Data rate (Mbit/s)	Prepaid package	Fee per month
<i>Fixed line/ Fiber</i>				
Vietnam	VNPT	16	6 months	270,000 VND (12.07 USD)
Vietnam	VIETTEL	20	6 months	200,000 VND (8.94 USD)
Laos	Unitel	16	6 months	2,600,000 KIP (317.2 USD)
Laos	Unitel	4	6 months	480,000 KIP (58.56 USD)
Laos	LTC	4	3 months	540,000 KIP (65.88 USD)
<i>Mobile Broadband/Air Card</i>				
Vietnam	VIETTEL	3G (5GB)	30 days	70,000 VND (3.129USD)
Laos	LTC	3G (5GB)	30 days	50,000 KIP (6.1 USD)

Source: official websites⁶ of each ISP by November, 2016

Exchange rates refer to: 100,000 KIP = 12.2 USD; 100,000 VND = 4.47 USD

It also underscores the fee for mobile broadband in Laos which is much cheaper than the fixed fiber line service.

4.1.3. Applying Stage: Leading Practices of ICT in Teacher Education

Main actors for ICT in teacher education at the national level

NUOL and MoES both play vital roles in the progress of ICT integration in teacher education. The IT Center of NUOL has been upgrading its ICT system since 2004 and applying ICT in the teaching-learning activities, research activity as well as the planning and management of NUOL. Moreover, MoES is designing a model for technical cooperation to develop human resources in ICT for public and private sectors. Mr. Sithisack, who is an ICT TE, gave 50 out of 100 scores to the performance of MoES and said it has a lot to do to improve and update equipment, train more professional TEs for TTCs and provide more TLMs for teachers. A narrative of a PT also indicates a hope to train more teachers who can teach computers

⁶ Lao Telecom (English): <http://www.laotel.com/en/>

VIETTEL (Vietnamese): <http://www.viettelhochiminh.vn/>

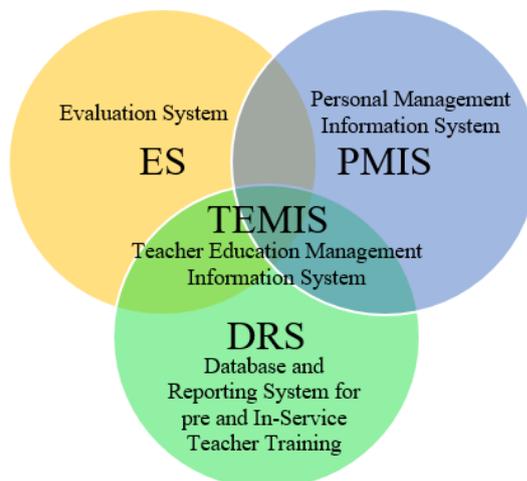
‘well’. Although not mentioned, the ‘well’ here may refer to the maximum of utilizing the available ICT resources.

Laos is a really underdeveloped country while the IT system is quite modern. Although general teachers can teach about basic computer skills, we still lack of teachers who can teach some new program and techniques of how to use computers as well. **Porvue Chandeevue- I₁₂**

Signed by UNESCO and DTE of MoES, the project ‘Next Generation of Teachers’ (Bangkok, 2006) considered advanced ICT infrastructures such as the interactive whiteboards powerful and interesting tools for pedagogical activities and has distributed them to schools and TTIs. It also launched a 3-year plan (2006-2008) for ICT application in 3 TTCs (Luang Prabang, Savannakhet, Bankeun). Since 1997, national workshops of which the topics covered software application for teaching and learning, solving hardware problems and Database and Reporting System (DRS) have also been prepared for ICT development in TTIs. Table 6 shows a Six Phases Five-year Plan which was promulgated to fully develop TEMIS. It is an integration of three database system (Figure 7). The downloadable standardized indicators in English enables researchers to better use the online database of teacher education in Laos.

Table 6 Six phases five years plan for TEMIS (2008)

Phase 1 TEMIS Preparation
 Figure 7 TEMIS: Integrating DRS, ES and PMIS (2008)



Phase 2	To develop a simple pre-service teacher training database piloting at two TTIs liking to the DTE, to make full functional DRS at the piloted places and to analyze data by using the database
Phase 3	To extend the model at all TTIs (and to increase other databases based on the TEASP into the DRS. To integrate PMIS database and the in-service teacher training database at national level)
Phase 4	To integrate PMIS database, pre and in-service teacher training databases, and evaluation system at provincial/TTI levels
Phase 5	To monitor, encourage and review for improving the TEMIS
Phase 6	To extend TEMIS databases at district level

E-lesson system: the national project and its reflection on school level

The ongoing e-lesson project designs electronic resources for students at tertiary level, including teacher education. It is still in the developing and testing process although the structure has been built up and few parts of the contents have been filled in. It provides more materials and be a new approach to learning and teaching activities.

A group of domestic educators and technical elites are optimistic and participate in the early stage of e-lesson development. Having a comprehensive understanding about Lao education and distance education, Mr. Maaly in the interview told this study about what has been done, what will be done, what is lacked and whose participation is needed. He also shared his story about the distance education he once engaged in⁷.

We also build up the website for e-lessons. This website has installed all lessons and curriculum including those for PTs, at least 1000 subjects. To take the e-lessons or use it as teaching materials, it requires a username and password to log into the system. We do it to follow up which student comes to see the specific lesson, and which teacher uses this system. It is a kind of

⁷ **Mr. Maaly Vorabouth - I₂₁**: I received my master degree in leadership and Educational management at Stockholm Institution of Education in Sweden through a distance education program. During that time, I had chances to learn learning theories to know about how people learn. I also learnt leadership management and applied this perspective to see the ICT field. We also used framework and symbolic structures to see the ICT system and listened to different views. Before that, we simply saw ICT as something based on software. My thesis was about database and reporting system management based on six to seven theories and perspectives. We mainly studied in Laos and the professors often came to here to give us assignment and listen to our presentations for the final examination. We submitted our assignments and downloaded learning materials via the Internet. We have only been in Sweden for 3 months.

distance education. At present, some teachers use those learning resources to learn by themselves but few students do. I think, to make the distance education fully function only teachers are not possible. When all learning resources are instructed in Lao language, we can involve more students who are not good at English. We are working on that. Right now we have already had the bracket and we need to fill in more content. We have trained the TTC staff them how to give the website where they can install the content in and do it. It's a long way to go. We expect that in 2020 all contents can be installed.

Mr. Maaly Vorabouth - I₂₁

His words are verified by Mr. A. Thephavongsa, the head of Software Development Division of ICT Center in NUOL. He talked about the e-lessons are being developed and who also contributed to the whole progress.

It has been four years since we developed the courses in the Lao language. We have completed five courses: some introductory courses, basic economics and general chemistry. They are used as additional courses for university students who test the system at the same time. **Mr. A. Thephavongsa - I₂₂**

In class observation O², the TE showed the website for e-lessons, took a course about IELTS as an example and asked the PTs to think about the advantages and disadvantages of e-lessons and how to use them effectively as TLMs in the future. How do TEs and PTs look at the concept e-lessons?

I heard about distance learning in our class. There are pros and cons. The course is easier to take and it needs less staff. However, many schools in Laos don't have Internet connection and enough computers for distance learning. If I have chance to have distance learning, I hope there is Lao language version, it would be better. **Joy- I₅**

For TEs, some had heard about e-lessons or the e-learning centers. Some had also tried using online systems e-lessons but none of them had ever been trained through any forms of distance education. Although they agreed that e-learning might be beneficial to Lao people whoever want to improve their knowledge, they still considered the language issue. A TE who can speak fluent Thai said he did not feel comfortable that Thai is so popular among

young people that they always communicate, type and search for resources in Thai, both online and offline. They all agree on the idea that even though most of the Lao people can use the Thai to use the system, there is a considerable need to develop the system in their own language, Lao.

To conclude, challenges for TEMIS and the e-lesson system are obvious. First, TEMIS has not been applied in all TTIs. The funds to keep the school domain name is frequently cut off and many schools cannot continuously access to the database and website. The e-lesson system is not fully functional either. One of the biggest difficulties it faces is to amplify the online TLMs in the Lao language.

4.2. ICT Integration in Teacher Education at the School level

4.2.1. Background of LPB TTC

Before looking into how ICT has integrated into teacher education at the school level, it is necessary to know about the background which includes the history, layout, discipline, routine and curriculum of the school.

History

Since its establishment in 1959, there have been four biggest changes on its name and system program which are coincidentally related to the biggest events in the higher education history of Laos. It was first called ‘École Normal Section 1-ans’ as a Francophone institute. In 1965, the name was changed into ‘École Normal Luang Prabang’. When the Communist Pathet Lao movement came to power in 1975, the school was renamed as No. 2 Teacher Training College in LPB which was presumably equivalent to the provincial branch school of HIPV. Its mission then was to prepare new teachers for Luang Prabang and Sainyabuli Province. After HIPV upgraded and renamed as UPI in 1988, the name was changed to the Higher Teacher Training College of Luang Prabang in the academic year 1989-90. In the same year when NUOL was founded (1996), the school got the final name

Luang Prabang Teacher Training College (LPB TTC) and has been used until now.

In the academic year 1961-62, the school completed construction and launched its first program dominated by the one-year curriculum of training primary school teachers in the French language. Three years later, the programs were upgraded to 2 years and 4 years and whoever finished primary school can join the training programs. In academic year 1984-85, after a decade development of universal education since 1975, two more programs 8+3 (medium level) and 11+4 (bachelor level) were added while the latter 11+4 programs have not been popular due to teacher educators' shortage and underdeveloped social need until recent days that the current programs used by LPB TTC in regular semesters are 12+2 and 12+4.

Layout

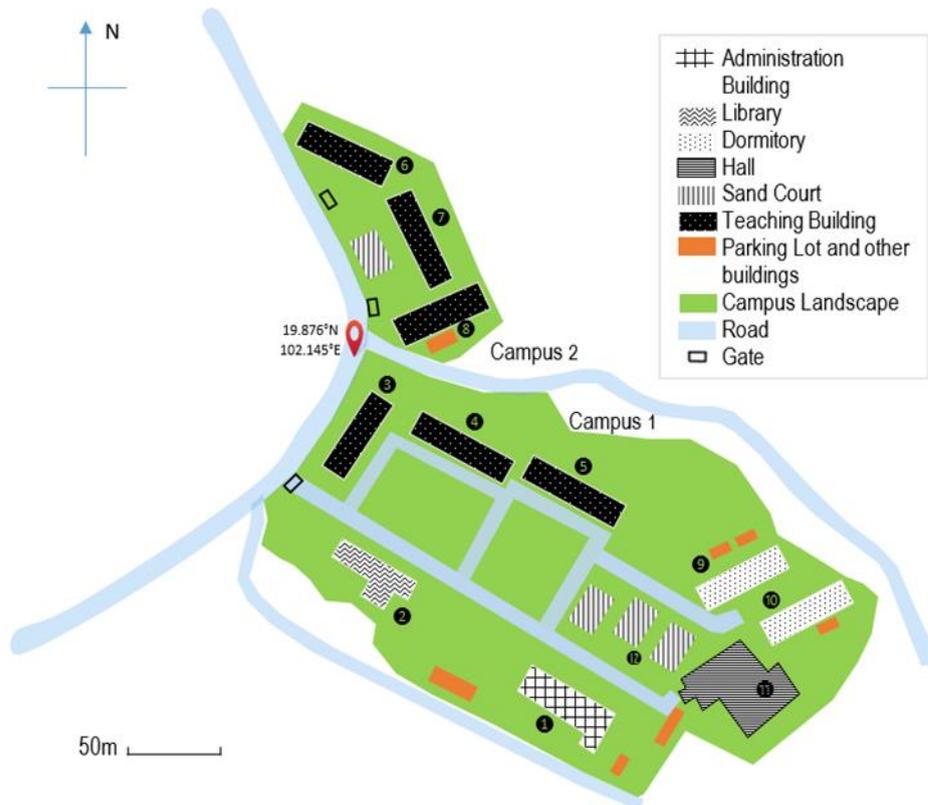


Figure 8 Campus map

LPB TTC (19.876 N, 102.145 E) is located in the lower south of the central downtown of LPB District, LPB Province. It is 4.6km western to the International Airport, 2.6km southern to the Mekong River bank as the crow flies and 1.5km to the major tributary Nam Khan. The school is separated as north and south campus covering a total area of 86560 m². To have a clear concept of the school layout, this study made a simple campus map (see Figure 8) by shaping Google satellite map. It can only be used for reference as it was not drawn by accurate mapping and scale.

The school has 11 buildings, 3 in the north campus and 8 in the south. Each campus has 3 teaching buildings, making up totally 6 teaching buildings with 69 classrooms. There is also a library, an administration building, a hall and two dormitory buildings in the south campus⁸.

Electricity is available in all buildings and the Lao government bears the complete expense of electricity in LPB TTC. However, as some buildings are equipped with large energy-consuming electric and electronic equipment like the air conditioners and the web servers, not until 2015 did the Electricite du Laos (the governmental authority for electricity) undertake remedial actions to solve the problem of insufficient electric currency.

What LPB TTC respects: discipline and routine

The Lao society upholds a relatively strict discipline and hierarchy. In LPB TTC, all school affairs take a top down flow. The staff members who are in charge of each unit have the bigger voice than the others. Discipline, as a kind of organizational ritual, is an indispensable component in constructing the social dimension of an institute which can be identified here and there in the campus of TTC. First, PTs are required to wear school uniforms on every weekday. PTs are free to decide whether short or long-sleeve shirt they want to wear, but it is mandatory for male PTs to wear dark trousers and female PTs to wear *sihns* (a traditional tube skirt for women in

⁸ See Appendix 2: Buildings and the function of LPB TTC

Laos and Thailand) with special bottom patterns to mark as students. For staff members, they have to be dressed in the soldier-like yellow green (close to RGB: 162, 185, 100) uniforms on Monday, Wednesday and Friday. On Tuesday and Thursday, they can wear their own clothes but have to be formal: sihn for the female and black shoes for male. There is no pocket for sihn. Although in summer, a group of PTs prefer to add a jacket over the shirt. The jackets can not only show their different personalities hidden under the uniforms, but also have pockets to hold money or mobile phone.

Classroom discipline doesn't forbid using the mobile phone to take photos as notes. No sounds would come out because of photos taking as PTs usually switch their phones to silent mode. Some classrooms atmospheres (e.g. O₁) are rather loose and relaxing. TEs care less about the non-participating PTs and make more interactive activities (asking questions, making eye contacts, etc.) with participating PTs. TEs are not responsible for taking PTs' attendance either. A specific staff member randomly checks the attendance during the break.

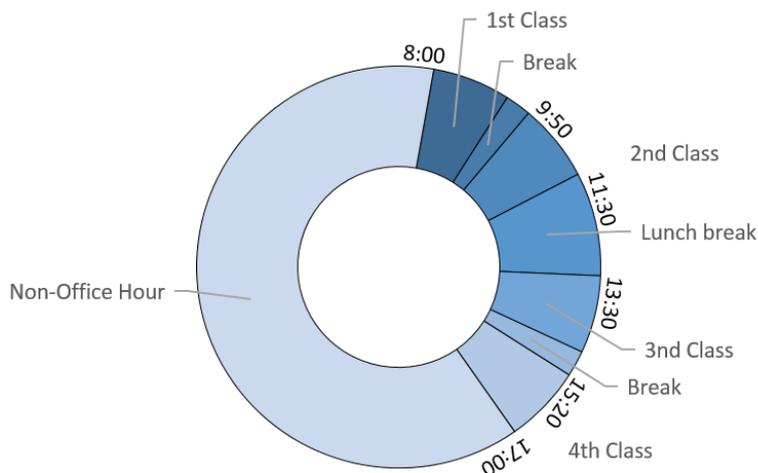


Figure 9 Campus Routine

The daily routine (see Figure 9) in LPB TTC sometimes reflects differently from what outsiders imagine. There are seven hours for office hour. The first class starts at 8:00 and the second at 9:50 in the morning. The lectures are ought to last for 90 minutes. TEs can decide when the class will

have the break. During the two-hour noon break, all students leave the campus to have lunch or take a rest. The afternoon class starts at 13:30 and ends at 15:20. Usually, there is no class after that. PTs and staff members who claim to have finished their work can leave the school at this time.

In the interviews, PT said that the TEs don't always come to class on time. After TE arrives, if the projection is needed, it will take about 5 minutes until the projection appeared. In the class observation O¹, PTs did not tend to help the TE to set the projection equipment before class. The TE did not try to arrive earlier to avoid taking time from class.

Curriculum

LPB TTC has programs for pre-service teachers (are only launched in regular semesters) and in-service teachers (for upgrading or training specific skills, are usually the summer and winter programs, night programs and weekend programs; only provided when registration number reaches to a certain amount). The current school system comprises three types of program: 9+3, 12+2 and 12+4. 9+3 faces to PTs for primary schools from the remote rural area, issuing medium degree. 12+2 meets the demand for preschool teachers, issuing diploma degree. 12+4 issues bachelor degree and produce teachers for primary and secondary schools.

Table 7 displays the current 17 programs of 13 majors in the academic year 2016-17. However, as some programs are divided as lower secondary focus and complete secondary focus, there are more than 17 curricula used in the TTC. PTs who study curriculum of lower secondary focus deal with less knowledge content. Although the curriculum is given by the MoES, it is TTC's freedom to decide what courses will be delivered for the semester. All courses are mandatory so that PTs in the same class of same major have the same time schedule as the other classmates.

Table 7

Registration of each program in LPB TTC

Programs in Regular Semester (2016-2017)	Registration Year			
	1	2	3	4
12+4 English				•
French	•	•	•	•
French Literature			•	
Natural Science				•
Basic ICT	•	•	•	
Math			•	•
Physics	•		•	
Chemistry	•	•	•	
Social Science				•
History		•	•	
Lao Language		•		•
Primary Education	•		•	
Preschool Education	•			
12+2 Primary Education		•		
Preschool Education	•	•		
9+3 Primary Education			•	
Preschool Education		•	•	

The emergence of course management system

At present, the school still follows a traditional way of course scheduling and there is no course management system. Each department has an academic staff who knows clearly about which TE teaches which subject to arrange the course timetable. To avoid conflicts of the uses of classrooms, especially general courses such as Basic Computer in the computer lab, they have plenty of meetings before and at the beginning of each semester until the courses are finally fixed. In respect of this, Mr. Sithisack said that not only Savannakhet TTC is thinking about this issue, TEMIS is also developing a course management system for all TTCs.

4.2.2. Emerging Stage: School Environment to be Ready for ICT Integration

Evidence which points to an emerging stage of the school environment is with reference to the identification of the vision, role and missions and classroom level infrastructure for ICT integration in learning and teaching.

To begin with, although ICT is not mentioned in the school vision, there draws a destination of ‘globalization’ and ‘training more qualified teachers’ which optimistically welcomes ICT integration in LPB TTC.

Our vision is to achieve the highest morality and quality of teachers and to promote unique culture, develop better environment to get our society ready for globalization.

LPB TTC also identifies its role in the society on the school website:

The role of LBP TTC is to implement new educational strategies and policies of MoES to maintain and improve the teacher quality for 6 Northern provinces in Laos...to cooperate with international agencies and both domestic and overseas universities...develop students' awareness of local customs and culture and educate them to enhance sustainable development.

We can witness its duties to perform to its superior authority, MoES and the strategies and policies it follows. It also demonstrates the domestic and global partnership valued by the school linking the school to the others. There is also a local concern of losing the distinct cultural identity when its education starts to embrace globalization (possibly brought by ICT integration). In the group interview with PTs from the Foreign Language Department (G₅), two PTs shared opinions on this conflict. Phonexay Chanthasuck suggested that some organization and authorities should talk with the local villagers to protect their culture; Porvue Chandeevue, on the other hand, thought that there should be policies and regulations and ICT is ought to be used to protect the local culture instead of doing harm.

As for the ten missions, five of them were likely to create a suitable environment for ICT integration. First, Mission 4 requests that the proportion of doctor, master and bachelor degree holders should reach 1:6:3. There's no doubt that ICT integration is a knowledge consumption process which requires a strong fundament of highly professional staff. In Laos where ICT resources are insufficient, longer education usually means larger exposure to the training of ICT skills. In line with this need, Mission 6 outlines the plan to build up research capability which is weak at this point. LPB TTC has set up its database⁹ for administration use demonstrating the

⁹ Link: <http://uangprabang-ttc.edu.la/temis-report-web/>

potential of developing the academic database to support research activities. Mission 7 emphasizes the value of building alumni network and indicates the using of ICT to connect the school's domestic and overseas human resources past and forward. The last mission based upon a reconciliation of the value of sustainable development is to build the green campus for favorable learning and teaching environment and to allow ICT to participate in planning, monitoring and evaluating the process.

Classroom level infrastructure for ICT integration in learning and teaching

There are six teaching buildings with classrooms. Windows in both long sides of these classrooms provide good and even natural lighting. However, it is usually too strong for projection to give the best picture. In the class observation O¹, the curtains failed to keep the light out (see Figure 10). The projection was directly projected on the blackboard of which the size was estimated as 400cm*120cm by the eye.



Figure 10 Class observation O¹

All furniture for general classrooms are made of solid hardwood. There are two types of desk-chair sets 1) double-seat desk and long bench without back and 2) tablet arm chair desk with storage bin. Desks were often arranged in columns and rows. Classrooms with tablet arm chair desks are easier to realize radial or group arrangement. In addition, with tablet arm on the right side, this kind of chair desk only allow to sit in from the left side. The tablet has no pivot and sometimes it is not horizontally fixed on to the chair. As there is no pen slot on the desk, stationary and books always slip

off to the ground. There are two wall sockets in each corner of the classroom. Students are free to use them to charge their phones or laptops.

No ICT equipment is installed in the general classrooms. However, there are overhead projectors in science and language labs.

4.2.3. The Emergence of ICT Unit and the Undergraduate Training about ICT

The ICT unit was set up in 2008. The office is located on the 2nd floor of Administration Building. It is in charge of all the ICT courses and maintenance of ICT infrastructure in LPB TTC (e.g. the DELL Web Server and Network Server which were kept in a server case in the office of ICT unit). In 2014, it received its first year of PTs of regular program. There are seven people working in this unit.

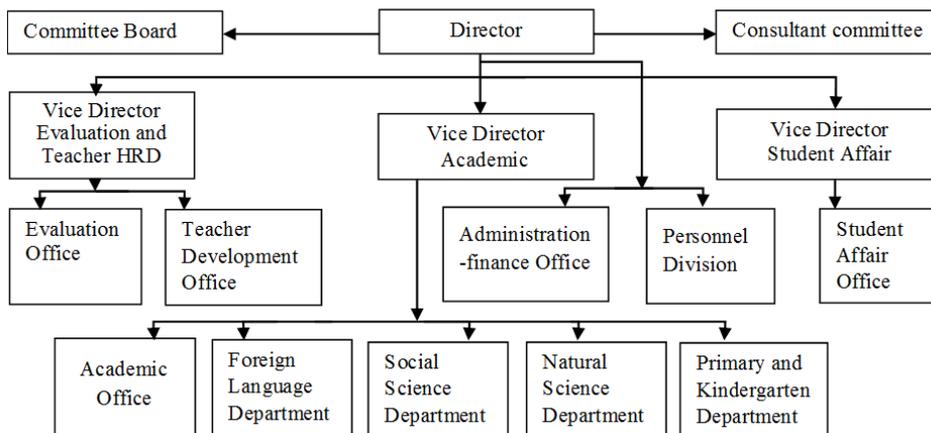


Figure 11 Organization structure of LPB TTC

Mr. Joe is an ICT TE. He talked in the interview about the education background of his colleagues. The head of the unit majored in English. Before the establishment of ICT unit, he taught English in the Foreign Language Department and had an overseas study experience in Japan. Other ICT TEs majored in either math or computer science. Two of them are female graduating from SU: one had an experience studying in Vietnam; the other, Ms. Nang Somephet, got married and gave birth to a girl.

ICT TEs in the interview said they were not trained appropriately or supported enough. They felt they were only familiar with ICT knowledge at

a general level of understanding and had few chances to improve due to the insufficient infrastructure, lecturers' knowledge and instruction methods.

When I studied in SU, we only had ICT courses for two semesters learning the basic computer skills, like MS office. We didn't learn programming, C language or Linux. The computers were not enough for all students. In order to practice more when we were able to use the Internet, we watched some videos to teach ourselves. Joe - I₁₈

Mr. Joe's narrative indicates that the limitation of his undergraduate training might motivate a behavior of self-directed learning enabled by the use of Internet. The insufficiency of ICT equipment at tertiary level for the ICT TEs is still existing. Ms. Nang Somephet started working in LPB in 2014. She graduated from SU and was admitted to the Faculty of Computer Science in 2009, which was the first year for SU to enroll students for ICT Department. She gave two examples for her claim about the lack of practice.

...It was the first time for me to learn about computer. In SU, I mainly learned about the website and the basic computer knowledge. We usually downloaded PSP, SPL which are used to support the website. The computer labs don't have enough computers for every student. We can only sit in groups of 4-6 people. Only one or two people in each group are able to use the computer in class for practicing. Some teachers could not teach well and did not understand everything they need to teach. Some old teachers are good but there are not many. We only listened to the teachers and looked at the pictures they showed, but the practice, no. Ms. Nang Somephet - I₂₀

In general, she expected better training experience (better ICT infrastructure and instruction method of teachers) than she had. She further said that teaching ICT requires TEs a certain volume of interdisciplinary knowledge. That's why English and Math courses are also included in the Basic ICT curriculum. However, the lack of intense training brings her and her colleagues of many difficulties which require them to teach by learning.

TEs' ICT training experience for Basic ICT skills

According to the survey result, 5 TEs thought they were sufficiently trained in using ICT, one totally agreed, one have no idea and one disagree. Despite this, in the group interview (G₈), TEs reviewed that the training they had on computer skills was not enough. Not enough equipment for them to practice in class, too much focusing on the computer basic skills in the curriculum which impede them to learn more advanced skills from these courses. It implies they are not familiar with ICT integrated pedagogical methods which require not only a mastery of basic ICT skills but also a rich knowledge of what should be taught and how to interact with the students.

The most fundamental and common training is to gain basic ICT skills. TEs can obtain basic ICT skills through 1) their undergraduate learning experience about ICT which to some extent determines their attitude and behavior of using ICT in teaching; 2) self-funded extra ICT training programs and 3) training workshops arranged by the school.

Ms. NTI teaches Math Education. She had a training experience for 3 months in a computer center. The course was 4 hours every weekend. Some trainers were university lecturers from ICT Department. She said it was popular for them to earn extra money from this kind of special courses. She paid 150,000 kip (equals to 18.4 USD) for training. She admitted that she learnt a lot from it. - G₈

This female TE was the only participant in the group interview who claimed to have experience in local computer centers. What she learnt from this training which implied it would impact on her teaching in LPB TTC.

However, not all TEs who consider themselves lacking ICT skills would be willing to invest in ICT training. In order to promote average ICT skills of TEs to spur working and teaching efficiency during their service in TTC, the ICT unit arranges workshops which take place in the normal working situation on LPB TTC campus:

ICT Unit is responsible for the arrangement of short-term (five days) workshop to train teachers to use Internet on campus, to register E-mail, and

to use Microsoft office, etc. We also plan to train them through e-lessons. Training workshops will begin in October. **Sithisack Manipoun - I19**

In-depth teaching resources and TEs who are capable of delivering advanced ICT knowledge and pedagogy in TTIs are always in shortage. Therefore, to centralize and make better use of available resources, the central government, sometimes in cooperation with international agencies, organizes training programs about what they think that are useful ICT skills for TTIs. The training is usually held by DTE of MoES in Vientiane Capital. DTE sends the fax to inform TTCs as official procedure and also posts on the Facebook group of meeting and training information which is faster to inform a larger number of TEs in a second. In G₈, a non-ICT TE from French Education and an ICT TE shared their training experience about *Ubuntu* for one week in NUOL. The training was delivered in French language and the ICT TE could not understand. He could only follow the steps or wait for his companion to translate for him.

Sometimes, ICT TEs are specifically called to receive training and there are generally three purposes in accordance with their duties in TTC. In order of the frequency, the training is about (1) TEMIS and e-lessons; (2) assisting TEs on their use of ICT in teaching and (3) improving ICT skills. In the narrative, Mr. Sithisack Manipoun shared his training experience:

Being the head of ICT Unit requires me to represent our school to attend meetings in the field of ICT, alongside which there are training programs. I received training about using TEMIS to collect students and teachers' data. LPB and Savannakhet TTC are two pilot colleges to use the database. We input the data together. We sometimes ask other ministries to help us. Now, our school is also connected to Luangnamta TTC. If one school tries to upgrade the database, we hold a meeting to discuss what kind of information should be included and what software should be installed and what problems should be fixed to help each other. **Mr. Sithisack Manipoun - I19**

In some long-term training, as women are considered to be prone to the influence from family, they are usually not the preferable candidates. However, Ms. Nang told this study differently about how she deals with the potential conflicts between family and overseas training. She said she was not aware of what she would like to be trained and to be enhanced. She owed it to the insufficient materials given to her. Her reply underlines the necessity of consistent monitoring, evaluation and training of TEs' ICT ability:

I have never thought about the question whether I want to improve my ICT skills and which part I want to improve. I don't know what else there is beyond what I learned about computer science as we were only taught about the basic skills. However, if there is a chance for me to have training about computer skills in Laos, I would like to know more about the programming and software. Now I have a family and a cute daughter. If there is a chance for to study abroad, I think there will not be many problems for me. My family will not be a burden for me. My parents and my husband's parents can look after our kid. And my husband can also teach our kid. I would like to take the opportunity to go studying abroad. Ms. Nang Somephet - I₂₀

4.2.4. From Emerging to Applying Stage: ICT Infrastructure and Facilities

This part starts with a review of how ICT emerged in LPB TTC. It then identifies the current stage of ICT infrastructure and facilities that are applied in the LPB TTC: the school website, computer labs, projectors and the maintenance issue.

The Emergence of ICT in LPB TTC

The computer was first introduced in Lao teacher education in 1996. However, it was not until 2006 that LPB TTC was first installed with computers for teaching and the Internet in 2007. In November 2015, Internet was first connected to the computer labs in Building No.6. In respect to internet infrastructure, the official college website said, 'Broadband network; available Wi-Fi signals covering campus.' However, since the installment,

the servers have never been exchanged. Tearnoy, a 2nd year Basic ICT ST said, ‘...but we are not able to use the internet sometimes in our school because there are many people using it.’

The school’s Internet bandwidth is 8MB/s. Two local operators, Unitel and Lao Telecom (LTC), each provides 4MB/s service to the school. Unitel was founded by Lao Government and the Vietnam investment together, while LTC is in the joint operation of the public and private partnership. Unitel, whose Fiber to the Home (FttH) service costs LPB TTC 450,000 KIP/month (55.02 USD/month) is slightly cheaper than LTC. The school has budget for the Internet fee and it plans to increase another 6Mbit/s. Mr. Sithisack said that he was still worried about the costly fee as Internet access and a higher data rate is indeed luxurious in Laos.

Although Wi-Fi and the fixed line Internet is available on campus, some TEs and PT with a need of high-speed Internet connection usually buy the 3G air card. They prefer LTC’s 10,000 KIP (1.22 USD) one-week 1.5GB card.

Individual ICT devices such as personal laptops of TEs are commonly seen on campus, to prepare courses in offices or to teach in class. To know how much the ICT devices could be affordable for TEs, this study conducted AMWA₂ (anonymous writing activity) to ask TEs in the group interview to write down ratio of their monthly salary to the affordable price of a computer. Based on the result, the computer price is 1.5 to 6 times more than TEs’ salary. Nevertheless, they still save money to buy one. Some PTs also bring their laptops to school, however, all witnessed to be male PTs. For mobile phones users, there are still a few PTs claimed that they don’t have one.

TEs have different standards and attitudes to the condition of ICT infrastructure. In the online survey, five of the eight TEs claimed ‘I have no idea’ to the statement ‘The ICT infrastructure in this TTC is functioning well’. Two agreed with the statement while one ‘totally disagree’.

Applying Stage: School Website

The website of LPB TTC was first launched in 1st Oct, 2012 which has been the window for the world to know about the school. TEs said if the Internet works well, they log into their school website to review news, notices or to input and check students' record in the database¹⁰.

A few of its links are invalid. Table 8 shows nine articles which are uploaded in a module called 'information science and technology'¹¹ with texts, pictures or plugins. The themes are about ICT, physics, chemistry and biology. They are about the instruction of using a software or a function of the computer, an opinion towards a newly developed OS and some popular knowledge of information science and technology.

Table 8

Nine articles of in school website

Topic	Field	Content type
WordPress	ICT	Instruction
Solutions for MS Offices crashes before we save the files	ICT	Instruction
Defragmenting hard disk	ICT	Instruction
Is Windows 8.1 better than Windows 8?	ICT	Opinion
10 Q&A about computer: files cannot be deleted	ICT	Knowledge
Movement and the speed of light	Physics	Knowledge
Molecular weight and chemical equations	Chemistry	Knowledge
chemical formula and equations	Chemistry	Knowledge
Nervous system, organs and nerve cells	Biology	Knowledge

What worth mentioning is an embedded ISSUU document introducing the way to use WordPress to design the webpage. The instruction language is Lao while the language for the software is English. This 55-page document was written and uploaded in Feb 2015 by a faculty member of ICT who graduated from the faculty of Computer Science in SU. He is also the author of the other articles about ICT in this page.

The application of computer laboratories of LPB TTC

There are totally 4 rooms that can be counted as 'computer lab' in LPB TTC: an e-reading room, a tablet computer lab and two computer labs.

¹⁰ Link: <http://luangprabang-ttc.edu.la/temis-report-web/score/>

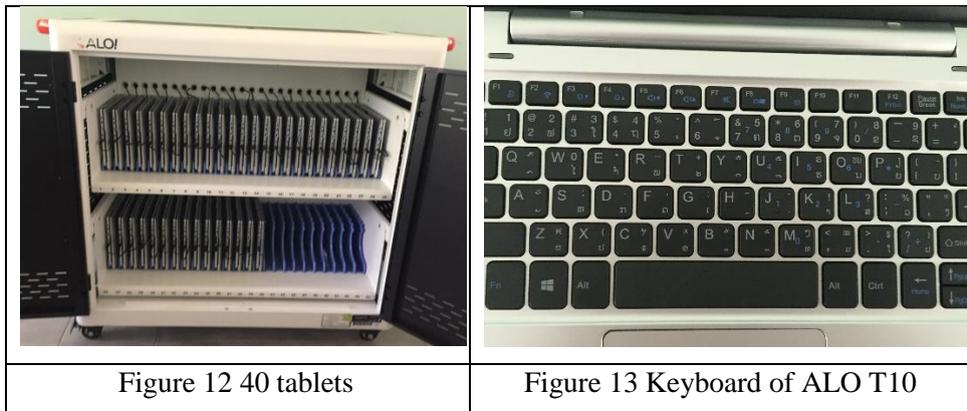
¹¹ Link: <http://luangprabang-ttc.edu.la/lp2013/?cat=22>

In the e-reading room next to the library, there are around 30 computers. These computers could only be used by PTs from the Faculty of French Education until recent years when operating systems in English were installed. Since then, the room has been available to all.

The tablet computer comes into use in the 1st semester of the academic year 2016-17. It has no difference from ordinary classroom except a mobile metal case with 50 slots which can store and charge 40 tablets computers when the power cord is plugged in (see Figure 12). Being printed with Lao alphabets (see Figure 13), the keyboards conduce to an easier memorizing of the layout and faster mastery of typing skills for PTs than before. A PT shared how he was frustrated in typing Lao texts:

The teacher gave us homework to download information on the internet. I tried to type the Thai language but couldn't find the letters on the keyboard.

Seathong Lor - I₁₄



Computer Lab A6 in Figure 14 is on the 2nd floor of Building No. 6. It is installed by 15 ceiling caged fans (3 columns X 5 rows) and 10 lamp tube boxes. There are 30 student seats and each is equipped by an acer® main unit (Pentium CPU) and monitor¹² (17'', produced in Aug. 2007), Compaq keyboard (pasted with Lao alphabet stickers), a mouse and a wooden computer desk. All the electronic equipment arrived at LPB TTC through CDG Systems Ltd. which a company from Thailand providing IT services

¹²Product detail: Acer AL1717 FB Black 17" 5ms LCD Monitor, 300 cd/m², 5:4, 4.3kg.

to countries on the Indochina Peninsular for over four decades. The teacher's seat is in the left corner of the front, equipped with a HP® main unit (inter core 2 XP inside) and monitor (22").

There also line a dozen of computers in need of repair at the back of the classroom. In the right back corner, a router, a WAP, a fast Ethernet media converter and a UPS are piled in a mess covered with dust. The lines are tangled up. Here are some comments on ICT facility of A6.

We have used these computers for two years. However, they were secondhand have been used for almost ten years. The quality is not good now, they are broken sometimes. This lab is used for teaching Basic Computer courses. Every day the classroom is full. Mr. Sithisack Manipoun 's memo of facilities in Lab A6 - I₁₉



Figure 14 Computer Lab A6

In class observation O⁴ (see Figure 15), Computer Lab A5 was used for the course Software Application for 3rd year students of Basic ICT. There were 30 PTs and 30 computers in this class. As one computer was broken, except two female PTs sharing one seat, the others were distributed to one computer each. They sat on plastic chairs or long wooden benches without the back. Monitors and a pair of computer speakers were put on the trapezoid

shaped desks (this kind of desk is widely used for class collective activities). Students sat against the long sides of the desks and the parallel short sides face the blackboard. Monitors (size) are 'acer'. The floor, where the main unit was directly put on, was fully tiled. Electric wires were exposed on the pathway without covering.



Figure 15 Computer Lab A5

The main difference between Lab A5 and A6 is that A5 is equipped with more advanced facilities. Mr. Sithisack stated in his memo that although computers in Lab A5 have been used for two years, the core i5 CPUs are still in good quality. He and Tearnoy (I₄) are both satisfied with the condition of this lab. There is also an interactive whiteboard standing in the front of the Lab A5. ICT TEs said that they often use it to teach and it is very helpful when it is connected with database (e.g. e-lessons). However, they also worried that it might be just a useless fancy machine with no difference as ordinary projector and screen if the internet is broken. The advanced facilities in A5 could not be enjoyed by all PTs in LPB TTC. It was exclusive to non-Basic ICT students.

The use of projectors in LPB TTC

TEs can borrow the projectors for classroom use. There is not enough budget to install projection devices in every classroom. Although the portability of the projectors allows TEs to make full use on the premise that, Mr. Sithisack argues that if the projectors are not fixed, they always spend around 5 minutes to set up the whole things before class. Each department has 4 or 5 projectors. TEs said these projectors are not enough for TEs to use in all classes.

Maintenance and the Sustainability of ICT Infrastructure

The 9 TEs in interview G₈ have somewhat negative comments on the insufficiency and poor condition of the school infrastructure. They hope to replace the old devices with new models or update for better service. However, being ‘old’ is not always the problem. It indicates a lack of proper and regular hardware maintenance of which can reduce malfunctions, maximize the number of users and extend the lifespan of ICT equipment.

I hope to have a budget for a specific computer lab...We don't have an exact room for ICT but using regular classrooms as computer labs. We ask the electricians to install the lines. Those lines are not hidden under the floor or above the ceiling. We TEs teach ICT courses and keep the maintenance of the ICT facilities on our own. We don't have a special person whose duty is just to maintain the ICT devices. **Mr. Sithisack Manipoun - I₁₉**

First, ICT equipment is not installed in the desirable environment. Dust deposits are able to witness everywhere. No covers are used to protect the equipment from dust and wet. Electric cords are in a huge pile of maze hanging behind the computers or piled up in the corner. ICT TEs have noticed this problem, but no solutions have been taken. Second, there is an absence of well management and regulation for the use of computer labs and ICT equipment. No signs are posted in the lab to prevent users’ improper operations. Third, ICT unit does not have a specific position taking responsible for the maintenance and sustainability of ICT infrastructure at

school. ICT TEs said they are usually too busy to take care of maintenance and management.

4.2.5. Applying Stage: ICT in Curriculum

At the applying stage, the school ‘adapts the curriculum and increases the use of specific ICT tools in various subject areas’. The curriculum is downloadable from the school website. This part introduces how ICT has been integrated into the curriculum at the applying stage.

Curriculum for non-Basic ICT Major

All majors now in LPB TTC have at least one ICT course to learn the basic computer skills. After viewing all the curriculum, this study lists all the subjects for Non-Basic ICT major related to ICT and groups them into four categories in Table 9:

Table 9

<i>ICT related courses in non-Basic ICT major curriculum</i>	
ICT Skills	Basic Computer 1, 2, 3, 4; Basic ICT Software Application* Operating system* MIS* Information system* Database management system* Network and computer security* Internet* Teaching computer*
ICT Pedagogy	Education Technology** Technology for teaching and searching + Use ICT in Teaching* Presentation Skills*
Knowledge about ICT	Technology in everyday life Imitating electronic / Law*
ICT-supported	Phonetics** Using Software for Research*

Note: “” = courses for English Education; “+” = for French Education; “**” = courses for both.*

There are three common courses about ICT: Basic Computer, Basic ICT and Technology in everyday life. In the curriculum, except Primary Education (12+4), all 4-year programs have Basic Computer for 4 semesters.

2-year programs only have the ICT courses in the 3rd semester. For Primary Education, the first computer course is in the 7th semester. French and English Education have ICT pedagogy courses that other majors do not have. Despite some non-Basic ICT PTs gave good comments on the ICT TEs of their teaching pedagogy which makes them feel easy to understand, some claimed that the ICT courses are so basic that they had already mastered in daily life or in secondary school. A PT from Math Education told us, they need to learn about searching, reporting and search skills in consonance with the curriculum. Although these courses do not focus on ICT skills, they apply ICTs in the course. It is a sign for moving towards the infusing stage.

We need to learn the knowledge, curriculum and pedagogy of secondary Math education. We have courses for research and report in which we learn the methods and skills to search for academic information and write reports.

Chorlee Nengyakhoualee – I₇

After ‘learning’, ICT skills should be followed by proper practices. Courses which require PTs a certain level of ICT skills should be informed to the ICT unit in advance allowing ICT TEs to prepare PTs with the skills. If such coordination is absence, the below difficulty would continuously exist for PTs. The following narrative shows that the ICT curriculum has not completely compatible with practices. Courses teaching necessary ICT skills have not met the need of PTs with little ICT knowledge and experience.

This is our 3rd year. We need to use the computer to write reports. There are no computer courses for the first two years. We have to learn by ourselves to type to submit to the teachers. **Primary Education – G₆**

ICT in Teaching Practicum

A three-month teaching practicum (worth 9 credits) is mandatory for all PTs of 12+4 in the last semester of their four-year study. They also have a short-term practicum course called ‘Experience’ (worth 1 credit) for 3 semesters since the 4th semester. In this course, each PT is given the chance to teach in the local secondary school for one week. Although the PTs are

equipped with a certain level of ICT skills, as ICT infrastructure is absent in secondary schools, PTs have to use other pedagogical methods without ICTs:

From 21st to 25th Nov, 2016, I will teach English in a secondary school. I will prepare some teaching materials such as the flashcards, flipchart and the texts and write the lesson plans in the notebook. I cannot deliver the class by presenting PPT because in the secondary school, there is no projector. All I can use is the chalk and the blackboard. **Phonexay Chanthasuck –I₉**

Curriculum for Basic ICT Major

The Basic ICT curriculum¹³ requires PTs of 161 credits to graduate, including 65 credits for ICT skills and pedagogy, 51 credits for general knowledge for teacher education, 33 credits for technical knowledge and skills and 12 credits for practicum. Its objective is to produce qualified ICT teachers for the secondary school to be capable of teaching ICT courses, assisting other teachers with ICT skills and keeping the maintenance of various school infrastructure and facilities. Among the 65 credits for ICT skills and pedagogy, despite two courses for ICT integrated pedagogical methods¹⁴, the focus has been put on improving ICT skills of PTs.

All of the five Basic ICT PTs who participated in this study showed confidence in their decision of choosing the major, considering personal interests and the necessity of ICT skills in education and the society:

... it is a great opportunity for me (to study this major) because it is a very new subject in the curriculum in the secondary school of Laos. I like studying computer and it's very interesting. **Joy - I₅**

However, Joy thought that the curriculum focuses too much on software:

The Lao government needs lots of ICT talents to contribute to the national agenda. If I have extra training opportunity, I will learn about hardware. **Joy- I₅**

¹³ Appendix 6 Full curriculum of Basic ICT Education

¹⁴ Using ICT in teaching and Computer Assisted Instruction are two courses for students in the 7th semester about ICT supported pedagogical methods.

What makes this curriculum unique and interdisciplinary is the 33 credits for technical knowledge and skills which are not related to ICTs. For example, in the 5th semester, three courses that they are required to take are Farming and Cultivation, Woodwork and Drawing.

Table 10 Timetable of 2nd year 3rd semester of Basic ICT

	Mon	Tue	Wed	Thurs	Fri
1-2		<u>MIS</u>	BP	<u>MIS</u>	WD
3-4	S&E	BP	WD	BP	CHLA
5-6	English	HHR	Activity	Politics	Library

**S&E=Sew and Embroidery, BP=Basic Programming, MIS=Management Information System, WD=Web Development, CHLA= Cultural Heritage of Laos and ASEAN, HHR=Humanity and Human Relationship*

Tearnoy provided his timetable (see Table 10) which goes well with the curriculum of his major. He needs to achieve 21 credits for this semester: 10 for ICT skills, 9 for general courses for teacher education and 2 for Sew and Embroidery (see Figure 16). Tearnoy thought this course ‘was nice’ but he didn’t really like it as he ‘could not make anything’.



Figure 16 TE took photo with Basic ICT PTs and their cross stitch art work.

TEs’ perception on their teaching and challenges

Table 11 the timetable of Mr. Joe. He teaches 14 course hours a week, among which 8 course hours are for the Basic ICT major. With a mathematic background, teaching MIS is not a big case for him. He said he is not able to concentrate on teaching because he also has administrative affairs to do and meetings to attend besides teaching which is a heavy workload.

Table 11 Timetable of ICT TE, Mr. Joe

	Mon	Tue	Wed	Thurs	Fri
1-2	/	MIS	/	MIS	Software Application
Class		2 ICT		2 ICT	3 ICT
Classroom		A5		A5	A5
3-4	/	Software Application	Basic Computer 1	Basic Computer 3	Basic Computer 1
Class		3 ICT	1 ICT	2 AF	1 ICT
Classroom		A5	A6	Social Science	A6

Additionally, as ICT TEs are also required to teach courses which they have little knowledge in due to the curriculum, they feel much stressful about these courses which have little relation with ICT.

It is quite challenging for us to teach the interdisciplinary knowledge in other fields, for example, agriculture. Mr. Sithisack Manipoun - I₁₉

4.2.6. Applying Stage: Using ICT in Learning and Teaching Activities

In the group interview G₈, TEs said they use (their personal) computers to work and prepare courses. They also have the Facebook group among teachers and also PTs to communicate and share information. Facebook is the most useful platform for them.

PTs who can clearly recall in what activities the TEs and themselves use ICT to teach and learn are more likely to carry out their own practices of ICT integration in teacher activities in the future. In this section, the study introduces the reflection of PTs and TEs about how ICT is used as a method in educational activities: presenting, recording, searching and word processing (for assignment).

Using ICT for classroom presenting and recording

Presentation Skill is a subject in the English Education curriculum for the 4th year PTs. The course emphasizes the use of various media and does not consider the skill of making and presenting PPT the priority of pedagogical method. PTs also learn from TEs presentation behaviors in class. The TE in observation O³ set as a good example:

It was the first class of this course. After the TE introduced himself about his contact and office hour (Figure 17), he started the course with a retrospect by showing a mind map with no content. With a few words of instruction, he invited PTs to the blackboards to fill in the blanks (Figure 18). When the practice finished, He showed a video by VLC Media Player about the education history of Luang Prabang. At least four PTs used their mobile phones to record the video while it was playing (Figure 19). The TE did not choose to play it through the full screen and no student reminded about it.

Field Note of class O³

Figure 17 TE's self-introduction



Figure 18 Filling the mind map



Figure 19 PTs' video recording



Three full observation all found that PTs use mobile phones and laptops to take notes. Based on the crude field materials collected during the classroom observations, this study designed 3 forms (see Table 12 to 14) to represent classroom settings, who used what kind of ICTs.

2 WS	Bulletin board		Blackboard			Bulletin board		2 WS
			Teacher's main active area					
Door			Projector & lap		M			
Curtains Windows	F	F Δ	F	F Δ	M	F	F Δ	Curtains Windows
	F Δ	M	F		F Δ	M	M Δ	
	F	F Δ	F		F	F Δ	M	
	F	F Δ	F		F	M	M Δ	
	M $^1\Delta$	F	M		M Δ	F	M	
2 WS			Researcher					2 WS

* M^1 used the nearest socket to charge his phone during the class.

Table 12 Classroom setting and ICT equipment in O¹

2 WS	Bulletin board		Blackboard			Bulletin board		2 WS
			Teacher's main active area					
			Projector & lap					Door
Curtains Windows	F	F	F	F	F	F	M \diamond	Curtains Windows
	F	F	F	F	M	M \diamond	M	
	M	F	M	M	M	M \diamond	M	
		M	M \diamond	M	F	M	M	
		Researcher					M \diamond	
2 WS								2 WS

Table 13 Classroom setting and ICT equipment in O²

2 WS	Bulletin board		Blackboard			Bulletin board		2 WS
			main active area					Door
Windows shutters	Projection screen	Teacher's	Projector, laptop & speaker					Window shutters
			F	F	F	F Δ	M	
	M	F Δ	F	M	M	M		
	M	M	F	M				
	F Δ	M	M	M				
	F	M	M					
	M		M					
2 WS						Researcher		Door
2 WS								2 WS

Table 14 Classroom setting and ICT equipment in O³

The outline of the form means the classroom. The double-line boxes represent desks. The single lines inside some double-line boxes divide the seat. Each PT has one seat. Letter F and M represent female and male PT respectively. Coming after some of the letters are two symbols ‘△’ and ‘◇’ . The ‘triangle’ means the PT in this seat uses the mobile phone to take photos of the presenting materials during the class (totally 12 students) and the ‘diamond’ means the PT brings a laptop to the seat. ‘WS’ stands for wall socket and there are 2 wall sockets on each corner of the classroom. The boxes in shade mean the TE uses the socket to charge the laptop and power the projector.

Using ICT for searching

In class, the teachers use the projectors to show us how to search for stories on the Internet, to teach us about the curriculum and the system (database) about the students' score. Lao Language Education - G7

Cultivating and performing searching skill both has significant relations with ICT. Participants of whatever major, when being asked about what they usually do by using ICTs, more or less talk about their experience of searching: for what (making TLMs), by what (computer, mobile phone or internet and the according applications) and what difficulties (the lack of practices, online resources in Lao language, etc) they had, etc.

It is in the course Division and Factorization of the 4th year students of Math education in the library. The TE asks the PTs to search for information about the knowledge both in library and internet. PTs need to finish a report about how and what they found in the task. Chorlee, a 21-year-old male PT shares his experience and what he learns. He is very excited when he finds the book ‘Increase the Minimum’ which contains the part he needs in the library. However, he says it is difficult for him to find appropriate materials as it takes him a long time. Class observation - O7

They have different strategies and teaching purposes when searching:

For people like us who would like to be kindergarten teachers need to understand more about the children, learn how to take care of them, have the skills to make toys, tell short stories and different materials for the children. For making the toys, teachers should know how to use the internet to find the pictures, print them or draw them. For stories, we use the internet to search for pictures which go well with the stories. **Ting Xaiyasouk - I₁₃**

Some PT said that the activities of searching in LPB TTC fundamentally distinguish learning in secondary school:

...in the secondary school, we mostly use the textbook to study and we can only learn from the textbooks. But now we have more. The English teaching style is different. Teachers first give us topics and questions, and then we search on the internet for as much information as we can to perfectly answer the questions. **Porvue Chandeevue- I₁₂**

The standard of assessing searching skill measures the accuracy of searching result in a certain amount of time through keywords by using a database or searching engine and selecting or eliminating strategy. Choosing the appropriate language is one of such strategy. Most literate PTs know more than one languages:

Although not much information is in Lao, as I can understand and type in Thai, I don't feel much difficult or inconvenient to search on the Internet for the information I want. For example, if I need to teach about the apple (I don't know the English word for it), I will type in Thai to search for pictures and videos about it. 90% of the Lao people can understand about Thai. **Ting Xaiyasouk - I₁₃**

Using online social network platform to communicate and share information

In the class observation O², the TE used his personal 3G air card to connect to the Internet. He first taught about how to use e-lessons resources. He wrote the website address on the blackboard: tci.most.gov.la (see Figure 20). With the class monitor's help, the TE divided the PTs into groups and showed them about how to set up the online study group and upload documents on Facebook.

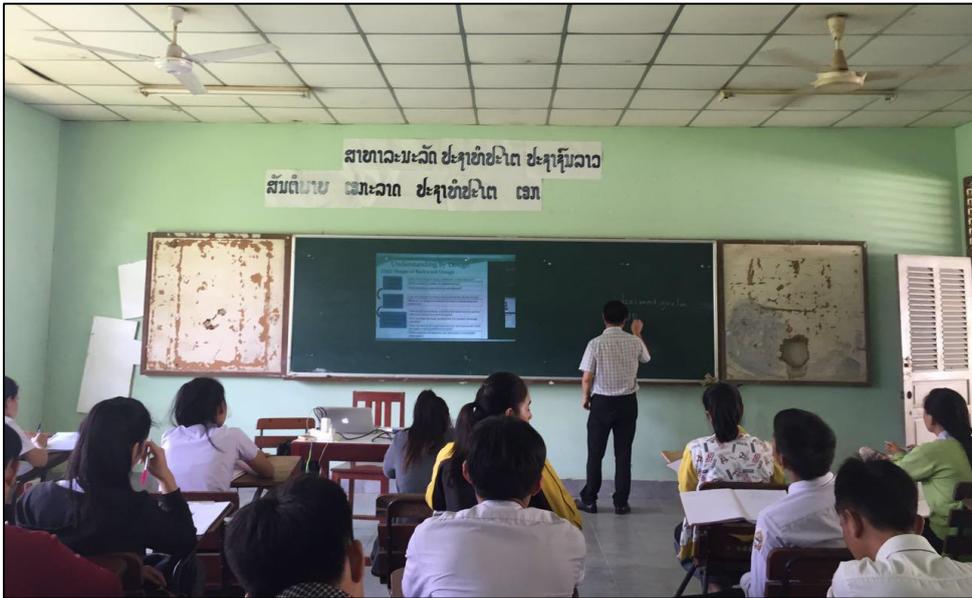


Figure 20 Class observation O²

The behavior of sharing needs a group of people to form a community. Sometimes, the purpose of sharing is to narrow the gap:

I think most of us have similar ICT skills. If someone ... if we do better, we will share it with the others... sharing ideas. **Phonexay Chanthasuck – I₉**

Using ICT for doing assignment

Assignment helps students to strengthen the skills they learn from the class. All PTs need to use ICT skills to write reports. In Figure 21, a 4th year PT from Math Education was working on his report in an empty classroom during the lunch break. PTs of Math Education said that they always use the computers to do the assignment, download information from the internet to assist their study.

However, how frequent and when do PTs start to learn writing reports depend on the curriculum of each major. PTs from Math Education and French Language Education are given the most assignments which they need to use the computers and the internet to finish. It is a collective preference of TEs to give assignment whether by use of ICT or not.

Sometimes in TTC, not very often, perhaps 1-2 times per month depending on the subject. The teacher may ask us to find an English story or something like

that. Some of our students prefer to search it on the internet instead of going to the library. But for the other homework, we write for most of the time. **English Language Education - G₅**

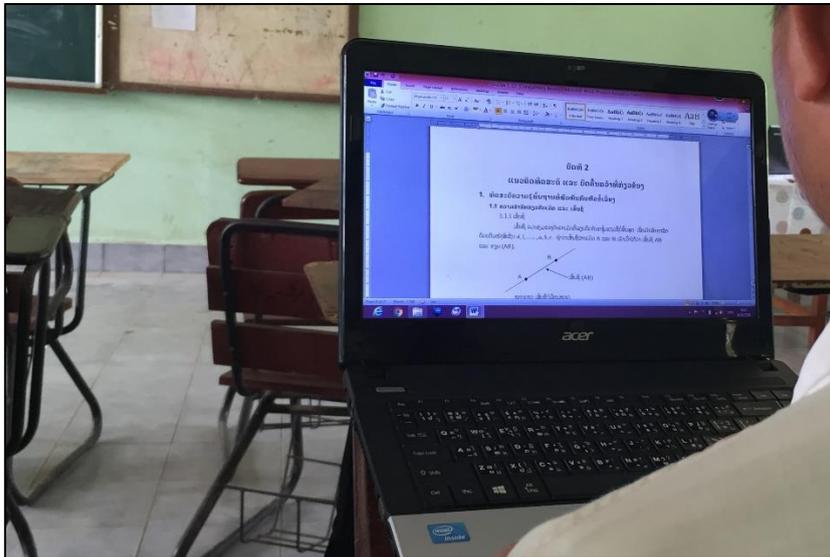


Figure 21 A PT writing report on his laptop during lunch break

4.2.7. Infusing Stage: Using ICT for Creating TLMs and Instructional Design

Teaching/learning materials (TLM) broadly refers to a wide range of education materials that teachers use in the classroom to support specific learning objectives (Lewis, 2016). In the context of Laos where even textbooks are scarcely available for students to possess, it is teachers' duty and challenge to create materials for teaching activities. Lacking TLMs brings lots of challenges to teaching in LPB TTC. The narrative of Mr. Sithisack indicates that the government encourages the use of ICT to create TLMs for teaching.

We write textbooks and prepare the course on our own. We find information about the subjects and use all kinds of materials which we think are important and useful from website. As MoES only provides us with the curriculum outline - title without content, the address of the website or the name of the book, teachers need to have basic ICT skills to search on the internet. **Mr. Sithisack Manipoun - I₁₉**

For some PTs, to be in class is the main or the only way to access to TLM. Lacking TLM means more burden for TEs as they have to prepare them on their own. Mr. Joe told this study that he has no textbook to teach MIS. For the course Software Application, it is only provided with the English version of the textbook partially translated into Thai. Accordingly, the insufficiency of TLM can also be an issue of language. Without being provided with the textbooks in Lao language, TEs ought to make the translation version for the class. To relieve from the burden of preparing TLM alone, TEs collaborate and work step by step within the groups.

With the increasing use of ICT in class, textbooks can be served as the reference for classroom activities of which the instruction, for example in class observation O₃, followed the PPT and videos that were presented through the projection. Lacking TLMs is a problem at all levels of education in Laos. Some PTs in the interviews found that ICT can enable better cognition education. They are also aware of how ICT can help relieve the problems of materials shortage and appreciate the changes brought by the Internet which allows children in the remote areas to learn about the world:

*When we teach Lao language, according to the preschool education curriculum, teachers need to help the children develop the understanding of the objects by comparing the Lao one and the foreign one. So we need to learn how to make materials of animals, fruits, flowers and vegetables which have never been seen by Lao people or don't exist in Laos before and show the children. But the problem is, the children can only know about the objects through the name or the pictures, it's quite hard for them to see and recognize them though more and more new things can be imported from the overseas nowadays. Now ICT helps us to search for more information about the objects and make materials for teaching quicker and better than before. But I still find it hard to teach. **Ting Xaiyasouk - I₁₃***

When thinking of whether and how ICT can facilitate the extension TLM, we need to be clear of the current situation that not all TEs use PPT to teach:

Some of our teachers like to use the PPT and the projector to teach but not all. It depends on subjects or the teachers of how often they want to use it in class. Some teachers always use the projectors while others never. NTI - I₁₇

Nevertheless, some PTs expect ICT to change the landscape of TLM from desert to forest. They recognize that it is risking to expose their children to foreign culture through Apps in non-Lao language at the early age would get further away from their own culture and values. Therefore, PTs from the Primary Education hope that:

...there can be more apps for us to download Lao songs, videos and Lao alphabets to teach the young children and primary school students. We can find a lot in Thai but few are in Laos. Primary Education - G₆

ICT for Instructional Design

In the presentation Mr. Maaly made in 2009 for Annual Mission of MoES-Sida, he reported that Broom's and Gagné's taxonomy were introduced to TEs to develop the database for examination evaluation. Despite using as exam evaluation design, taxonomy is originally created as an instructional design model which helps establish learning objectives. It can be assumed that instructional design has also been applied in teacher training through various ways.

In the class observation O¹, the TE introduced using UbD to design Lao language lesson. The TE used PPT to show the concept and mind map, word file to present the templet framework and PDF file about sample course design. The TE also led the class on the blackboard to review the steps of using UbD to make a plan of Lao language teaching. In Observation O², after emphasizing the importance and popularity of using UbD, the TE showed the PTs about how to quickly search for related and easily understandable materials on the Internet.

UbD model was first introduced in LPB TTC in 2015. TEs said that 2/3 of the secondary schools in Laos have been encouraged to use UbD for classroom instruction and performance assessment. Pedagogy with the

support of ICT is not the major teaching task for ICT unit. However, ICT TEs think that if they keep using ICT to apply UbD in class and assigning ICT supported homework to PTs, it will leave a subtle but positive influence on their' future teaching behaviors about ICT.

4.3. ICT Integration in Teacher Education at the Community Level

There are different quality and quantity of community engagements in different stages. This part introduces six aspects of ICT integration at the community level that influences teacher education: ICT environment and courses at local secondary schools, the partnership with local private sectors, training experience in local ICT centers, and teachers' online community.

4.3.1. Emerging Stage: Experience of Learning ICT in Local Secondary School

Since the academic year 2011-12, ICT curriculum has been integrated in upper secondary schools based on NESRS. However, ICT courses and infrastructure are still out of reach in most secondary schools around the country. Among the 20 PTs who were interviewed in this study, only one responded about the availability but limit she experienced about computer courses in secondary school. Ting Xaiyasouk, 20 years old is in her first year of study in LPB TTC. Her experience of learning computer skills was in the recent two years. Her home district, Xiengngeun is to the southeast of Luang Prabang district.

In the last year of high school, I learned about using Internet, Microsoft Office and to draw on the computer. There were more than 40 students in our class, but only 4 or 5 computers. We tried to learn in groups. We had only two hours to study in class per week. Ting Xaiyasouk - I₁₃

4.3.2. Emerging Stage: Preparing the ICTs in Working Environment for PTs

PTs need the process of ICT integrated classroom activities to practice their ICT skills and pedagogy to reinforce awareness and behaviors of teaching with ICT. However, the discrepancy between what PTs have learnt

and how they can use ICT in the future classroom is clear. PTs lack of confidence in how they can effectively transform their ICT skills to teach.

I will be a secondary school teacher in two years. I will have difficulties in accessing the internet, computers, the software, the school website and database. Also, there must be new knowledge about ICT for which I cannot stop studying to keep up with the latest technologies. I'm afraid because I find I'm slow to learn and understand all. **Somphone Phonpaseyth – I₂**

Although PTs are equipped with at least the basic ICT skill, not all TEs expect them to apply it in secondary schools. Mr. Maaly said that by 13th May, 2008, there were had been only 122 personal computers in 16 piloted secondary schools of 6 provinces. 6 of these 16 pilot schools were only provided with the funding for internet service fee and printers. They should bear the expenses on computers on their own. There is a concern that fewer public secondary schools in the downtown than expected have computer labs and hardly any school is able to equip classrooms with ICTs. Things are worse for PTs who will return back to the rural areas after graduation. Hardly any ICT is possible to use due to the lack of electricity.

4.3.3. Emerging Stage: PPP and ICT Integration in Teacher Education

The model for 40 the tablet computers in the tablet lab is ALO T10 with a market price of 2629000 kip¹⁵ (USD 323.37). All designs are done in Laos while the factories are in Shenzhen (a southern city in the Mainland China) and Taiwan. The sponsor is a local IT company: Alo! Technology Sole Co., Ltd which formerly specialized in project management and professional consulting services to international agencies and cooperation involved in national development projects since 2005. Deputy minister of MoES attended the official opening ceremony on 1st April 2016¹⁶. It represented the Public Private Partnership that reached in the field of ICT and education in Lao PDR. The company has a mission to help the country bridge digital

¹⁵Price reference: <http://alotechnology.com/?product=alo-t10-windows-10-home>

¹⁶News source: Lao National TV and Vientiane Times, 1st April, 2016

divide by providing low cost leading technology and green ICT equipment. It also promises to operate global standard innovative training and testing center in Laos to prepare local human resources for the global challenges.

4.3.4. Applying Stage: Learning Computer Skills in Local Community

There is another way to impart ICT skills. Five of the twenty PT participants shared their stories of training in local computer centers. Three of them are from Basic ICT and two are from English Education. Despite the same purpose to improve computer skills, there are slight differences in the program, the tuition fee and their motives and feelings afterward.

In the narratives (1) and (2), two PTs from Basic ICT talked about their three-month training experience. The course hours of the training that Tearnoy took three years ago were longer, but the price was cheaper. Although Somphone paid more than twice as much as Tearnoy, the training content he chose was programming, which required more professional knowledge than basic computer skills.



Figure 22 Mekong Computer Center

(1) Three years ago, I was trained in Mekong Computer Center¹⁷ (see Figure 22)... At that time, I knew nothing about computers. The tuition fee in the was 250,000 Kip (USD 30.84) ... Each class was over 1 hour on every weekday. We

¹⁷Address: Ban Pongkham 03/05 - 16, Luang Prabang, Laos Tel: +856 71 254773
Position: 19.891 N, 102.133 E

only learned to use Microsoft office. Now in LPB TTC, we learn many things: to use the Internet, write the program and develop the website. Tearnoy - I₄

(2) Last summer, Noy and I went to the Make Savanh Computer Center to learn programing. The course was 4 hours per week, from 8:00 to 10:00am everyday on weekends. The training fee was 600,000 kip (equals to USD 74). It was expensive for us but we need to improve ourselves. Our trainer, Mr. Bouhoun was very good at programing. Our teacher in LPB TTC, Mr. Sithisack is also good, but he is better at website. The facilities in the Computer Center are similar with the ones in TTC. But I think that the skills of the ICT teachers in TTC are not enough which are not able to support them go deeper and help us get more knowledge. Somphone Phonpaseyth - I₂

Somphone made clearer comparison between two pieces of training he had. He thought that the ICT TEs are not equipped with enough skills to be supportive in advanced ICT knowledge. Narrative (3) shared a training on hardware and repairing. The motive drove the PT to be trained was out of his part-time job in the guest house. Tearnoy, Phonexay and Korher all received the training before studying in TTC. At this stage, none of the four said that they trained because they would like to teach better in the future.

(3) I had two training experiences in computer. In 2011, before studying in the TTC, I learnt about basic skills of Microsoft Office and to set up Facebook and email account to use them. I paid the training fee, 250,000 kip (equals to 31 USD) on my own. It was quite expensive for me. In 2016, I completed a training course on Computer Hardware and Repairing¹⁸. We don't learn much about hardware in TTC. As I work in a guest house, I need to master certain

¹⁸ Phonexay Chanthasuck also provided course outline of the training:

1. Knowing computer hard ware and installation
2. Windows installation and driver setup.
3. Programs setup and Internet searching.
4. Network system setup, sharing and internet connection.
5. Hard ware and Software trouble shooting.
6. Virus protection and cleaning.

skills to work on the computer. If I did not know about computer, I might lose the job. **Phonexay Chanthasuck - I₉**

(4) After secondary school, I had extra study about computer skills for 3 months before studying in LPB TTC. I learned the Microsoft Office, the Internet and the email. It was about 5 or 6 years ago. **Korher Lercher - I₁₀**

Why do PTs want to have extra tutoring on computer and ICT skills? First, it is out of mere interest. This internal impetus is usually blended with external factors such as ‘Computer is important and indispensable in work’.

...people use computers in their work every day to make documents or to use the internet to access to various information. **Korher Lercher - I₁₀**

Second, as the skills taught in TTCs are too fundamental to some PTs and when they find that ICT TEs have limited knowledge, they resort to training centers for more specific and advanced skills to be competitive.

... studied together in a computer center because we thought we were lack of computer knowledge and skills. **Noy Xaiyaphon - I₃**

Third, from the narrative from Phonexay, he needs computer skills for work to earn money for his tuition fee in LPB TTC. He second training experience was also in line with Joy’s expectation on more training about hardware. Despite the insufficient skills of ICT TEs, they have always been striving to help the PTs to convert their obtained skills to teaching ability. That is what computer centers are not able to do.

4.3.5. Infusing Stage: Teachers’ Online Community

Online community or teacher association has grown into an active facilitator for teacher professional development. In Laos, with the spread of mobile Internet broadband is less difficult and expensive than before, there have been more and more online teacher groups on the major social network websites. Therefore, what kind of online groups do TEs join in?

Table 15

Facebook online groups joined by a TE in LPB TTC

1. Education and sports Statistics
 2. Teacher Education (in Lao, English and Thai)
 3. Friends of Basic Education Sector Development Program (BESDP) Laos
 4. Learning English for fun by Facebook
 5. Lao Curriculum Designers (LCD)
 6. Association of Lao Teacher Training Institutes (in Lao, English and Thai)
 7. Government Document (in Lao)
 8. Information of Teacher Upgrading (in Lao)
 9. Good Thing for Health (in Lao)
-

A TE provided this study with his list of Facebook online groups (see Table 18.). Teacher Education (7717 members) and Association of Lao Teacher Training Institutes (545 members) are two groups with the most active posts. Teacher Education was created by officials of MoES in 2012 while the latter was created by a Pilipino educator with the cooperation of MoES. In order to conduct online observation, this study gained approval from the administrator and join both of the groups. Most group members are TEs in TTIs or government officials and staff of international organizations which have projects in teacher education field. The posts are in various forms and contents. Members are free to share activities, document attachments which they think may be helpful to use, problems and confusion in work, recruitment notice, government official documents and all kinds of different ideas and teaching methods, etc. Lao language is mainly used for post and communication. Sometimes, English is used if the contents require. Thai is seldom used and usually only appeared as comments.

The TE told this study that although he didn't check every notification of new post, he feels good to be connected with people working in the similar position for the same goal. It is also interesting and beneficial to see what other TEs had done and learnt from their experience.

Using ICT to convey strategies of teacher community

Some TEs posts in the Facebook online groups to share the concepts they learn and apply to manage the off-line teacher community. Taken COE & COD as the example, which is the abbreviation for Center of Excellence and

Center of Development. The most frequent use of the combination of the term is from the Commission on Higher Education (CHED), Philippine. CHED established the term in the country's Higher Education Act of 1994 and identified it as the potent catalyst in teacher education needed for the development of world-class scholarships (CHED, 2015). A criteria and scoring guide is developed to select teacher education programs which reach the qualification of COEs and CODs. It is the system for evaluation which promotes the performance of TEs, builds harmonious and productive teacher community to provide quality pre-service teacher education program.

After first being introduced by a Pilipino educator in the Facebook online group, some TEs practiced in their TTC and posted pictures showing how the activities went on. It was reposted and commented by other TEs in other TTCs which implied that the activities might be learned and carried out. The Pilipino educator plays a promoter in this international education policies and experience borrowing process.

4.4. ICT Integration in Teacher Education at the Individual Level

TEs and PTs are the two major targeted groups in this study to know about ICT integration in teacher education at the individual level. According to the school database¹⁹, there are 79 staff members engaged in the teaching activities in the first semester (September 19th, 2016); and the enrollment of PTs in the academic year 2016-17 is recorded as 1345²⁰, among which 894 are female, taking up about two thirds of the total. There are approximately 30 students in each class. The 2nd year grade has the most students (14 classes) followed by the 1st year grade (12 classes) because of the 12+2 programs for preschool education and primary education for the remote areas. PTs in 12+2 programs graduate after 2-year study in LPB TTC. The smaller number for the 1st year PTs can be due to the ongoing admission

¹⁹ Relevant forms and figures of the data are reorganized in the Appendix 7 as reference.

²⁰ The number of enrolling students is collected from the school database on 9th Nov, 2016. It has not fixed yet as the admission process will not finish after midterm.

process of the new semester. 3rd grade and 4th grade have 10 and 9 classes respectively. The Basic ICT major has no 4th year student. It was first established in the academic year 2014-15. PTs' ages range from 18 to 23 accounting for 81.9% of the whole. Like other education institutes in Laos which own diverse ethnicities, LPB TTC is a community of 17 different ethnic group. The four main ethnicities: Lao (49%), Khmu (27%), Hmong (18%) and Lu (6%) take up over 90% of the total number of PTs. Almost all PTs (99%) come from the northern 8 provinces of Laos and only 15 are from Vientiane Province or the Capital.

4.4.1. Emerging Stage: Using ICT for Various Purposes in Daily Life

The emerging stage of ICT integration in teacher education should involve teachers' personal use of ICT and teachers are trying to improve their skills to apply ICT for personal and professional purposes. There are various purposes for PTs and TEs to use ICT in their daily life.

Before the group interview with TEs, the researcher conducted a prepared a small online survey²¹ with the TEs. There were three questions asking about the purpose of using ICT. To the statement of 'I am using the Internet for accessing and sharing knowledge and experience', half of them totally agreed, while three of them disagreed. In the statement of 'I'm using the Internet for my professional development through online or distance learning', five of them disagreed though two of them totally agreed and one agreed. In the statement of 'I'm using ICT in my teaching and learning', three TEs seemed to have never applied it in pedagogical activities. Nevertheless, a male TE reaching 40 years old said he usually use the Internet to search for information (news) and download TLMs for students. A TE aged 26 said that the first time he used the Internet was in social network. This TE is quite popular in Facebook with 12700 followers. He sometimes shares live videos and can post in four languages, Lao, Thai,

²¹ Appendix 1

French and English. In most of the TEs' mobile phones, there install apps for chatting, news or magazines, videos or drama and searching engines. The women TEs also said they usually search for pictures for courses.

Apps built for mobile platforms are called mobile apps. Different functions of mobile apps are also getting more interwoven than before. Being asked about what mobile apps they usually use:

...Line, Facebook, What's App and WeChat... We use these chatting apps to communicate about everything, sometimes about the homework. If we have problems about the homework, we usually take the photos and send it to our friends through these apps. Primary Education - G₆

It is noteworthy that in LPB TTC, a considerable number of TEs in their late 30s or 40s like to post about their life on Facebook. From the interview, there is a preference of Facebook over other App among all participants. They said they choose the apps depending on the convenience.

When it is offline, mobile phones are used to take pictures and help memorize. In the online environment, they are basically used to chat, search, share information, read news, do social network and entertain (playing games, watching video), etc. searching. Some PTs said that they learn English conversations on Facebook live or YouTube, set up group study on homework checking and use dictionary and translator for language learning. For downloading resources, they prefer to do on the computers. They also use software for work. They have the preference of the apps they download and they language they choose to communicate.

4.4.2. The Emergence of Using ICT in Life: First Experience with ICT

People's first experience engaging with ICT is sometimes the determinant factor in their attitude towards it and the knowledge they would like to obtain about it. It has a strong influence on the mastery of ICT skills, the willingness and performance in integrating in work and living, etc. The primitive cognition of them usually starts from the ICT in its materialized form. This study collected narratives of PTs and TEs of the first experience

with the mobile phone and computer. Narratives of 12 PTs were selected and classified into 6 positive and 6 negative narratives²². It did not mean that these PTs had absolute positive or negative memories when they were asked to recall their experiences. Instead, many of the narratives expressed an interwoven emotion of both frustration and encouragement. PTs with positive first experiences tended to take an active action towards computer or mobile using than the negative counterpart.

Four characteristics can be summarized the above narratives which contributed to a positive first experience about ICT: (1) a trusty companion or guidance; (2) convenience to access; (3) sufficient assistance and in-time solutions; (4) marking the transformation in life and (5) intrinsic interest.

From the very beginning, a trusty companion and guidance are crucial to sweep off the tension of using ICTs. For PTs who lacked the guidance in their first experience with ICTs, they were more likely to encounter anxiety and failure avoidance like Bounniaw in the narrative (7). In the narrative (1), the PT had her brother accompanied with her and in narrative (4), Joy had his friend living in the same room. Both of them could easily resort to help whenever they were in need.

At the same time, they did not have difficulties to access to the ICTs as people who were close to them possessed the devices. Chorlee (6) and Tearnoy (5) also had the convenience to use ICTs as both of time found the place where they could use the computer for free. Nevertheless, to whomever first get to know about ICTs, there must be problems that came across with them. The reason why they were not frustrated by the problems might because they received sufficient assistance and in-time solutions to solve the problems. In Noy's narrative (3), she said that she could type in English for message which was the possible and practical solution to the problem that in most mobile phones people could not type in Lao. Her first experience to be trained about computers in LPB TTC also implied that she

²² Appendix 4-2 and Appendix 4-3

should be available to receive assistance from the TEs and her classmates. Furthermore, if the computer or mobile phone marked the significant transformation in life together with other signs, (like Joy who moved to live in the temple and started to have access to the computer) it could also leave positive experience to that person. Lastly, as Somphone cried about in the interview, it was an intrinsic interest buried in him which always encourages him to actively engage in activities with ICT.

As for the ages of the participants who first experienced ICTs, the study found that there is not a clear difference between the two groups. Most of the PTs experienced computers for the first time in their late teenage.

Accordingly, this study owes the relatively negative experience to (1) solitude of using (2) inconvenience to access (3) insufficient and unsustainable assistance and (4) over seriousness and concern to ICT equipment. It is always said that interest and positive attitude are good teachers which can motivate and encourage people in learning. Although negative experience might impede the PTs to take active actions about ICT in learning and teaching activities, the awareness of their transformation from 'knowing nothing about ICT' to 'feeling the confidence to use it' can also help PTs to develop a consistent improvement about ICT.

4.4.3. The Emergence of Using ICT in the Future: Life Dream, Plan after Graduation and Challenges

In the interview, although not being asked or implied by the researcher, after recalling a piece of memory, many PTs spontaneously added with their dreams. Three of them showed their passion in teaching children to contribute to education development of their hometown. Another two PTs, who had generally good performance in class, wished to go for overseas study instead of teaching in the closest future after graduation. One of them depicted ICT in his pictures of dreams after graduation.

I have a strong will to study more and study abroad...I want to improve my English because being good at English is important to learn computers well. I

also want to study Korean because Korea is strong in making mobile phones and computers and all different kinds of software and games. However, I don't know how I can realize my dream. I don't have enough time to study. It seems to be just a dream and so far away from me. Somphone Phonpaseyth - I₂

Somphone is aware of the importance of English which can help him approach more online information and computer skills. He recognizes that ICT may maximize his potential and company him on the way of pursuing an overseas study dream. His struggles lie in how he can solve the conflict between study and work and start an effective way of study to put his dream into practice.

When I have time, I usually go to the Korea Center in SU to study Korean. I learn Korean from a professor and by myself. It is my dream to earn the scholarship in LPB to travel and study in Korea. Comparing to be a teacher after graduation, I want to study in Korea more. Kou Vang²³ - I₁₆

Kou Vang is a PT in Chemistry Education and was the only participant who talked in Korean in the interview. He actively posts about his school life (e.g. how they do the experiment in class), daily life (e.g. scenery of LPB) and social activities (e.g. what Korean or other foreign friends he has made) in languages he can manage to use in the Facebook. He indicates that by doing so, he may catch the notice of some Korean sponsors who can support him to study in Korea.

Challenges of ICT integration at the individual level: language barriers

'I can't have better skills because my English is poor'

Somphone said the above words with a sigh. Language barriers disable active learning in ICT training. Many PTs and TEs attribute the challenges of gaining better ICT skills to language barriers, not only English, but also French, which still has popularity in Laos and its neighbor Vietnam. We can remember how Joe was frustrated by his training experience about Ubuntu

²³ The original Korean narrative of this translation is in Appendix 4-1.

which was delivered in French. Joy added, being aware that English is a barrier to learning computer could be a motive for him to study English well. Although he hardly had problems in daily conversation of English, he's still worried that his English cannot help him get deeper into ICT.

When we learn computers, we cannot move on or we might make mistakes if we don't know the operating language. We need to improve our English proficiency but it takes time and efforts. Comparing to other students in my class, I do better in English and ICT. If I am asked to talk about how to do well in both English and ICT, I will just say, 'stay with it!' Joy - I₅

Challenges of ICT integration at the individual level: time shortage

'I don't have enough time to practice the skills.'

Besides the language barrier, Joy and Somphone were both afraid that the time they spent on practicing what they learn about ICT might not enough:

I have two part-time jobs: working in the Mekong English Center and a hotel. I don't have enough time to study. However, working is another way of practicing and it helps me improve my English and computer skills. Joy - I₅

My family is poor. In order to earn my tuition fee, I have a part-time job in Daofar nightclub. I am the lead singer in the band. Now, I live with my brother who works in a hotel in LPB. Besides learning ICT, I want to improve my English and learn a new language, like Korean, but I don't have much time. I wanted to stop the job but I couldn't. Somphone Phonpaseyth - I₂

It's quite common for LPB TTC PTs to have part time jobs. As a result of this, claims of lacking time to study are more than we could imagine.

As the economic state of my family is low, in order to earn my tuition fee, in the past two semesters, I worked as a waiter for the part-time job. But this semester, I quitted my job because I couldn't focus on my study and had very little time to learn. NTI - I₁₁

However, lots of part time jobs are related to what they have learned can encourage PTs to practice the knowledge and skills, and also help Lao people to practice a concept of time which the culture is not familiar to.

These days, I'm quite busy, not only because of the preparation for the practicum, but also my work in the hotel. On the weekdays, I work between 16:00 and 23:45 but on the weekend 13:00 and 22:00 **Phonexay Chanthasuck – I₉**

Over-workload and multiple roles (as technicians and teaching courses of technical skills in the curriculum which they have little knowledge in) for ICT TEs which also results in the lack of time for professional improvement, class preparation and concentration is a factor of low quality of on-campus ICT training.

Deeper applying, larger digital gap?

In LPB TTC, the digital gap of PTs and TEs can be recognized and perceived by themselves in the products they use, the subjects they teach, the skills they are equipped with, the ability to apply, the condition of infrastructure when compared to private institutes and the gap with the world.

Some of our classmates still have difficulties to access to the technologies. Some of them don't have their laptops, some of them, even they have a mobile phone, it is not a smart one. **English Language Education – G₅**

Firstly, in class observations, mobile phones used by PTs to take photos instead of writing notes varied. TEs affirmed that some PTs in their classrooms possessed the latest model while some are still using the non-smart phones. Due to personal learning habits and the adoption of ICT, some PTs still prefer handwriting for notes. TEs also admitted that there is a huge gap in Laos between PTs from the downtown who have easier access to ICTs than the students from the countryside. The digital gap brings inconvenience to all PTs in their learning:

For students in our class who don't have mobile phones or cannot connect to the internet, it's very hard to contact with them. But we have no choice.

Primary Education - G₆

Anyhow, being admitted to LPB TTC provides with some PTs probably the first experience to be exposed to these ICTs:

I have no money to buy neither the mobile phone nor personal computer. Anyhow, these things cannot stop me from being the top student in my class. Whenever there is homework that the teacher requires us to use the computer to finish, I always go to the computer room next to the library or borrow friends' or teachers' computer to use for a while. **NTI**

Later, known by the researcher, this PT who would not like to be identified bought a smart phone with Internet service. Now he had Facebook and WhatsApp account to allow his friends and teachers to contact. It indicates that the access to ICT can be a social stress on individual's mental activities and behaviors. Burdens (in terms of price and language) also come from the electronic markets in Laos, selling secondhand products with a high price from the world elsewhere. Instructions, operation panels are printed in English and other languages that they are not familiar with.

Some PTs talked about the connection and their affordability of Internet. They had a rather negative attitude to the condition this 'bridge' in Laos:

My place has internet connection as it is a guesthouse. Me alone cannot afford the fee. It's expensive and slow. **Tearnoy - I₄**

I buy the 10,000 Kip 3G card to use the Internet on my phone but not every week. **Chorlee Nengyakhoualee -I₇**

Some PTs made very critical view to the accessibility of Internet:

Having the access to ICT devices doesn't mean the same to the Internet. In Laos, Internet is expensive. Being able to connect to the Internet doesn't mean being possible to utilize internet. Common barriers are language and internet skills. **English Language Education – G₅**

As the PTs from Foreign Language Department have relatively higher proficiency in English, this study added some questions which were not asked in other groups. One of the questions was asking about their opinion on digital gap: For the students who have difficulties to access to ICTs, do you think this kind of situation is an obstacle for them to study in TTC? Being the first, Korher Lercher replied with the affirmation:

Sure, it is an obstacle. We usually have a group to finish the homework and sometimes we need to upload our answers on the Facebook or WhatsApp or WeChat like that. If someone does not have a computer or a mobile, they can use their friends' ask them for help, or they would not have materials... then they would not have scores for the course.

By hearing what his good friend had said, Phonexay Chanthasuck shared how he saw differently from Korher:

I have some other idea. I don't think that they cannot study because they don't have these ICTs. For students who may not have computers, as they have the textbooks, they can still study hard from the textbooks. It will be OK for them, because the most important thing is not the technology, but yourself. We have to concentrate and be intelligent. Because lots of students who come from the rural areas they don't have computers. Only students from the cities, they have the computers. So I think it will be hard for them.

Porvue Chandeevue concluded with a closing argument:

I agree with Korher that we can hardly work without computers. I also agree with Phonexay that we are able to learn without computers. I would like to add something. If we want to be very, very outstanding students, we cannot study without computers. Lives of Lao people are quite different from each other. Somebody they are so poor and they don't have computers. Somebody, their parents have plenty of money to support them, so it's quite comfortable for them to finish all kind of work. Now, most private institutes in Laos they use computers to teach the students. Public schools should also do it as well.

Although many PTs are aware of the digital gap and its influence on learning and teaching, few have any ideas of what can be done to narrow the gap. However, Porvue continued sharing his idea that in globalization, what impedes Laos to catch up with the world is a lack of funding:

It's quite expensive and hard to access to the technology in Laos. Many people in the rural areas don't have the chance to study computers. Some of my friends they don't even know how to turn the computers on. If ICTs keep being absent in our society, Lao people would never know about the fast global

*changings and we would never know what we ought to do to improve. Many developing countries are trying hard to become the developed countries. Laos should not be left behind. The governments try to use the ICT to help but they are a lack of funding and budget to supply all areas around Laos. The most important thing is to have more funding. If we don't have enough funding, I will not believe that all Lao people can be as outstanding as people from other countries. Absolutely, Laos needs funding to be modern. Funding is the first thing, the most necessary thing for us to develop. **Porvue Chandeevue - I₁₂***

4.4.4. Infusing Stage: Using ICT to Solve Problems

Some individual PT can use ICT to help them find solutions to problems, such as to free themselves from the troubles of complex maintenance and repair of ICT equipment.

*...in my free time...I like using computers. I usually use **Google** in Thai or English to search for information. I love watching videos, sometimes instructional videos to learn programming and using **Photoshop** on **YouTube**. When I have problems on the computers and when there is nobody like the teachers to ask for help, I always ask **YouTube**. I can find the answers usually. Most of these videos are in Thai, showing us the steps to install and use software or fix a problem of the computer. They are really helpful and powerful. **Somphone Phonpaseyth - I₂***

Somphone can proactively resort to the Internet for suitable resources to learn new skills and solve ICT problems. Bounniaw (I₆) also said that if he has any problem with the computer, besides asking the teachers, he also searches on the internet to look for the solutions.

4.4.5. Transforming Stage: ICT is an integral part of my life

With ICT penetration in PTs and TEs' lives, it has slowly grown into an attitude and habit for their learning and teaching activities. They 'share', 'search', 'present', 'download', video call, etc., in their daily life more frequently than ever before. There are some signs representing that some TEs and PTs have regarded ICT as an integral part of their daily life:

People can eat and live without meat but meat makes the body stronger. It's the same with ICT to education. For example, we can use our brains instead of storing information by computer. But, without computers, it would be slow. **Porvue Chandeevue - I₁₂**

Some PTs start to take ICT as their hobby:

In my spare time, I love dancing traditional Lao dance, playing volleyball and using computers. **NTI-I₁**

To those disadvantaged groups of PTs in the digital gap, it is indeed a luxury for them to develop ICT into a hobby. Anyhow, they have tried so hard to show a positive acceptance of the new skills, new teaching content and methods brought alongside with ICT:

After I become a teacher, I would like to buy me a personal laptop and mobile phone to help me teach. **NTI - I₁₁**

For some PTs, although they did not mention in their narratives what future action they would take about ICT, they acknowledged the influence of acquirement of ICT skills and knowledge has had on education activities, especially in learning outcome:

Comparing the past and present, I think ICT knowledge is updating very quickly. Now we have ICT courses in the secondary curriculum and by learning the skills, students can get a better grade in the class. **NTI -I₁₇**

Despite the low expectation from TEs of PTs to use ICT in the real teaching environment, a 1st year PT from Preschool Education still looked forward to the future of using ICT to teach:

When I become a teacher, I would like to use the computer, connect it to the Internet to download information, and help me make lesson plans. I will post them on the Facebook so that all the other teachers can download them. I will also let the children know that they can learn from lots of games on the mobile phones. But using ICT really hurts eyes. I need to tell them the harm and encourage them to use it in a good way. **Ting Xaiyasouk - I₁₃**

Similarly, Porvue saw the value of using ICT in teaching which lies in both learning outcomes and the transformative features which can change Laos and the views on Laos:

I'll be a secondary school teacher after graduation. As teachers are encouraged to use ICTs in teaching, I should also use them to teach and promote my teaching. They can really make students learn well. It is very useful to collect information and it can also help us to show what kind of country Laos is to the rest of the world. **Porvue Chandeevue- I₁₂**

Porvue also shared his perception of the indispensability of computer in learning and living:

... we should not study without the computer. We use the computer to learn and also to finish our homework. Sometimes, even if the teachers don't require us to use it, we use the computer to help us quickly find the information and finish the homework on time. **Porvue Chandeevue- I₁₂**

However, even for those participants who can take ICT an integral part of their life say that it is still hard to 'expect a continuously changing teaching methodology designed to meet varied learning objectives' as ICT infrastructure is not evenly distributed in the Lao context.

Challenges of effective ICT integration in individual level: Self-evaluation

The study invited the PTs to evaluate their ICT skills. Some positive attitudes are the acknowledgment of achievement in using ICT which may be obtained from a series of progressive assignments and practices.

AMWA₁²⁴- *I feel ok to use the computer. I use it to teach and learn. I can use Microsoft Office to do lots of things, for example, to write documents and reports. I also use it to check E-mail and get various information and resources on the Internet.*

AMWA₁- *I can be use the Microsoft Office, create email, post on the Facebook and surf on the Internet. I can also download, install and operate new programs. Sometimes, I can fix computers.*

²⁴ 3.4.4 Anonymous Memo Writing Activity

Some PTs could not give a clear perception of their ICT skills and developed a negative attitude. They considered their difficulties of not being equipped with advanced skills and the anxiety of not possessing ICT products as the sign for low ICT skills acquisition. In another word, they are anxious about their situation because they are aware of the digital gap in terms of both the physical form of ICT products and the levels of ICT skills.

AMWA₁ - I don't think I have good computer skills, because I don't have a computer or mobile phone...

AMWA₁ - I can only use Microsoft Office. I don't have other skills more than that. I don't have a personal computer, so it's hard to upgrade (the skills).

Math Education - *We are not so confident about our computer skills to teach at secondary level, which are too basic and not enough. We would like to study more advanced programs, like SPSS or advanced Excel skills.*

4.5. ICT Integration in Teacher Education at the Global level

There is an increasing investment from the global partners of LPB TTC and MoES on the ICT infrastructure implementation, professional development of teachers and the digitalized development of TLMs.

4.5.1. From Emerging to Applying Stage: Implementing ICT Infrastructure in TTIs

In 2006, during Sida's EQUIP Phase 1, it was the first time for the school to be equipped with 20 computers for teaching use. In 2007, technicians from France came to help set up the first network. A Francophone center in the Foreign Language Department is supported by them. At that time, there wasn't the ICT unit. In 2008, JICA provided the DELL Web Server and Network Server which are still being used.

During 7th to 11th December, 2009, Agence Universitaire de la Francophonie (AUF) held a short-term training project in LPB TTC called "Les pratiques de classe des enseignants de français langue étrangère" in French aiming to improve the local Lao teachers' skills of teaching French as a foreign language in the classroom setting. A part of the project was to

train about ICT pedagogical skills to teach French. Along with the training project was a donation of 30 computers (in the e-reading room) installed with Linux operating system in French. In G₈, a non-ICT TE from French Education and an ICT TE shared their training experience about *Ubuntu* for one week in NUOL.

4.5.2. Applying Stage: Voluntary Projects and the Impact of on Teaching and Learning Activities

There are volunteer teachers from Japan, France the US, Australia and Vietnam in recent years working in LPB TTC. Their main purpose is to improve classroom teacher training and better teaching skills by using the most accessible ICTs which is not taken as the necessary tools to teach. Instead of introducing the existing advanced educational technology in the developed world, these volunteers focused on effective teaching methods and pedagogies which could be feasibly practiced by the PTs:

The volunteers bring new ideas, useful teaching and learning techniques. If we go to the internet, they really have very good methods to help us learn. However, they didn't bring any new technologies that we have never seen before. **English Language Education- G₅**

Currently, JICA's voluntary project in LPB TTC is focusing on primary education. There is a female JICA volunteer assisting teaching activities in Math Education. 'We usually contact JICA through the volunteer it dispatched. It's better and faster' said by Mr. Sithisack, 'we also write reports to JICA to raise funds or ask for projects like training.'

Before JICA, it was Sida that worked in the area of education development. After Sida finished its projects in Laos, its regional focus moved to Africa. The TEMIS project was also partly supported by Sida in the last phase of EQIP II. We also have cooperation relationship with China. At the beginning of this year, the director of our school met with some Chinese officials who provided some equipment to MoES and visited our school. We also accepted one Korean volunteer in 2005 or 2006. She stayed here for two years. We mainly

use English, French and sometimes Lao to deal with all foreign affairs. Mr. Sithisack Manipoun - I₁₉

4.5.3. Applying Stage: Facilitating Digitalization of TLMs in Lao PDR

International organizations recognized Laos' situation of lacking TLMs. However, they emphasize on different subjects or different forms of the TLMs in the different time (e.g. Sida's Teacher Training Enhancement and Status of Teachers -TTEST program). Mr. A. Thephavongsa from the IT Center in NUOL (I₂₂) told this study that the current e-lesson pilot project is supported by UNESCO APCEIU and KOICA of which the cloud server of the system is in Korea. Both of the organizations provide funding and technical support.

CHAPTER V. DISCUSSION

In his chapter, the study discusses 1) how ICT has integrated into teacher education at the four stages and 2) how it can be more effective. Findings show that the ‘troop’ of ICT integration in teacher education in Lao PDR has ‘invaded’ into all stages. There are ‘squads of supply and covering’ at the infusing stage and a squad of individual TEs and PTs having reached the transforming stage to integrate ICT in teaching and learning. However, the main troop is still stationing at the stage of emerging and applying.

5.1. Transforming Stage: Individual TE and PT in the Vanguard of Integrating ICT in Life

A few individual TEs and PTs show a transforming characteristic as ICTs in form of mobile phones and laptops have been the integral parts of their daily life. They expect to see the continuously upgrading teaching methods and ICTs though they are worried about if they are able to understand and master the new things.

5.2. Infusing Stage: The Supply for Upgrading

The practice of using ICT for creating TLMs, instructional design, managing teacher community and solving problems meeting the infusing stage of ICT integration of teacher education.

TEs encourage and help PTs to set up the online community to collaborate with peers in solving problems and sharing information. Since Basic ICT curriculum came into use in the academic year 2014-15 in LPB, the outline is getting clearer for TEs to follow and they are also gaining more experience in developing contents for the subjects both on and off-line. The 33 credits for technical skills also involve interdisciplinary knowledge and skills for Basic ICT PTs, showing a sign of infusing stage of ICT integration in the curriculum. In respect to the theory and application of database, the course MIS is also included in the PT curriculum (Basic ICT and English

Education) which can help promote the future expansion of MIS implementation in secondary schools.

ICT also makes continuous training and the replenishment of materials possible for PTs. After PTs and TEs are equipped with the basic ICT skills, they start to use them in searching for materials on the internet or making electronic teaching resources on their own. They also use ICT in classroom bring opportunities for students who do not possess even the textbooks. Additionally, the mere transference of knowledge by ICT cannot solve the nature of education of Laos which lacks TLMs. The key is how to enable ICT to produce knowledge in the local context without depending on Thai, English or French language.

PTs are getting aware of how ICT is empowering their abilities and changing their methods in both learning and teaching. In some courses of LPB TTC, ICTs are integrated for pedagogical use, not simply as tools for educational outcomes.

5.3. From Emerging to Applying Stage: Stationed the Main Troop of ICT Integration in Teacher Education in Laos

Individual Level

To most TEs and PTs, ICT in education represents the equipment and Internet infrastructure in learning and teaching activities and the skills and methods to use them. They tend to regard ICT as (1) the ICT products which are individual property (e.g. computers, mobile phones); (2) ICT infrastructure (e.g. Internet); (3) ICT skills for various purposes (e.g. for teaching and learning, for daily use, for work and problem solving) and (4) ICT as an integral part of habit and hobby.

School Level

LPB TTC has generally fair environment for ICT integration: the vision and missions, the recognition of higher degree of staff members and longer teacher training programs human development. The school website has also

made a start of creating more online learning materials in Lao language and utilize the platform for knowledge diffusion, though several modules of the school website are not valid and the lack of English version cannot meet its mission of letting the world to know more about Laos.

Some classroom furniture (tablet arm chair desk and the trapezoid desk) shows the potential of to create a more flexible, collaborative, student-centered and ICT integrated classroom, however, the TEs have not fully used it. Also, as they are made of solid hardwood and extreme heavy, it is not easy to move them around and may make a large noise if the TE wants to organize the students to let them sit in new groups.

However, the current ICT infrastructure and facilities have not been fully implemented on campus. The interactive whiteboard is not being used to interact. Some ICT facilities are of good quality but they cannot be equally utilized by all PTs. The school still lacks the budget to buy better models and to upgrade the Internet service. The absence of proper maintenance cannot guarantee the sustainable ICT integration in TTIs.

The pre-service curriculum used in LPB TTC has recognized ICT as necessary knowledge and skills as well as the useful tools to develop pedagogical methods. Foreign Language Department which has the most beneficial conditions to access to abundant learning and teacher materials also has the most diverse ICT related subjects for its PTs.

The overall classroom activities are still teacher-centered domination. ICT related subjects in LPB TTC are also ICT skill-based. TEs are aware of the usefulness of applying ICT in teaching although not all of them would like to or could use ICT in the TTC classrooms and to expect PTs to use ICT in secondary classrooms in the future. These are the situations in teaching and learning activities which keep dragging ICT integration in LPB TTC to leave the emerging stage.

ICT unit is a structural team, collaboratively working together to prepare TLMs for PTs and on-campus workshops. The short-term training

workshops for non-basic ICT TEs quickly deliver target skills that are needed instantly for work and it doesn't require ICT unit as much preparation and knowledge as the long-term training. As the training takes place on campus, it is more convenient for ICT TEs help the faculty members to get familiar with the ICT environment and let them feel more comfortable to use ICT.

There are also some points which may be the barriers for moving completely to applying stage of ICT integration. The traditional costumes are not convenient to carry the ICT devices, although there have alternatives to this inconvenience. Classroom discipline welcomes the use of ICTs, however, the classroom environment and rituals are not completely ready and it takes some time to implement fixed projection suites and blackout curtains. Also, in Lao people's concept of time, the preparation to get ICT devices started in class does not seem to be a 'wasting of time' and they don't seem to be interested in schedules or punctuality. There is no specific rule or ritual in respect to the classroom electronics management either. We don't know if PTs and TEs can develop a habit of self-management and maintaining the ICTs used in the classroom. The short office hour in the routine also stops a group of students who do not have personal computers or laptops, to practice on the devices on campus.

From Community to Global Level

As good partnerships are the promises on potential supportive educational resources from partners, LPB TTC has not only developed a number of partnerships internationally but also with the Lao domestic private sector. The framework for PPPs in Laos is being developed by the local government with the support of ADB and UN ESCAP. Given the case of Lao local IT brand Alo!, it has recognized the importance of supporting ICT integration in TTIs and now it is time to consider PPP as a powerful tool in promoting ICT integration in education development in Laos. The emergence of ALO! and the partnership of private sector and MoES will be

a turning point in ICT's integration in education which used to depend heavily on international development partners. Nevertheless, it heavily depends on Internet connection, server and electricity and requires a certain level of ICT skills and perception of its users.

ICT integration in teacher education requires an accomplishment in higher education. To increase the quality of teacher education means to enhance the quality of TEs which means it is necessary to guarantee the undergraduate education they receive. TEs' acquisition of ICT skills can be acquired through their ICT training in undergraduate studies. Computer science has become a subject in Laos' higher education only in the recent years. According to the Population and Housing Census 2015, the total population who once majored in Computer is 8493, which is 2.1% of the total 398958 people who have attended higher education. Most of these graduates go to IT industry. As a result, only a few TEs in the TTC have been trained professionally in computer science. Thus, except this small group, most TEs have similar ICT training experience in undergraduate.

Although the e-lessons or distance education is being developed in Laos and has been introduced in ICT courses in LPB TTC, the country has not been ready to prepare an equal environment for distance education for teachers. The gap between perception and utilization of it among different groups is huge. Some ICT TEs from ICT unit said that they have never heard about e-lessons/distance education and have no idea of what changes it may bring.

The database, website and e-lesson system provide ICT integration in teacher education with considerable electronic resources. They are also the prerequisites for deepening integration. As one of the earliest forms of ICT integration in teacher education in Lao PDR, the database enables effective teaching and administrative activities in pilot TTIs such as LPB TTC. However, it still faces challenges at the national level and stagnates at emerging stage, as the current online database remains bugs which make

trouble for some cluster statistics to synchronize and it has not been activated by at least all 8 public TTCs.

5.4. More Effective ICT Integration in Teacher Education

Lao government states that at least in the recent five years, infrastructure and human resources about ICT will still be at the emerging stage compared to the global average nationwide.

At a school level, to make ICT integration happen in the current situation, TTIs are making a clear and comprehensive vision on what environment they can provide for ICT integration. The alternative criteria are also being developed for estimating attitudes and identifying obstacles of ICT training and integrating ICT in learning and teaching activities. In the case, LPB TTC is aware of the underlying contradiction and challenges during the process of ICT integration. It knows that ICT, on one hand, may disturb the local culture but on the other hand, help the world to understand about Laos. However, it cannot provide TEs and PTs with the necessary support to achieve more effective ICT integration in teacher education.

Using ICT for learning and teaching: more freedom or more burden

People don't always feel free when given more choices. Since the integration of ICT in teacher education, TEs have been given more choices to choose TLMs and methods in their teaching. However, it has brought TEs with new challenges to prepare new forms and contents of TLMs overwhelming course load and administrative duties. Similarly, although PTs have more tools and platform to learn, if they don't learn with ICT, they feel that they are left behind.

As some TEs do not have relevant ability to create TLMs, ICT can only be used in the level of transferring knowledge and has limited use in creating TLMs. The need of ICT unit and the inevitable shortage of human resource in ICT related majors also make TTCs turn their staffs with little background to the expected professional ICT trainers and technicians who can not only

deliver courses but keep the maintenance of all ICT infrastructure and facilities at schools. To pick up one of the new conflict faced by the future administration and development of ICT in teacher training institutes is whether to set up a new position to the ICT technician.

Appropriate language for ICT integration in teacher education

As the lack of TLMs makes language an inevitable issue in education, it is necessary to talk about what can be the appropriate language for ICT integration. When Lao people first knew about ICT equipment, almost all input systems, operation systems and program contents are in English, Thai or French. They use one of those input systems to represent the pronunciation of Lao words. This gives them the natural acquisition to use non-Lao alphabets to communicate in ICT environment.

Although Lao input keyboard was later invented and could be installed in mobile OS, it has not gained much popularity among Lao users. Lao people often say that they have difficulties in typing in Lao. In chatting, they prefer English, which is faster and sometimes Thai. The other reason why they don't use the Lao language to search is online materials in Lao are in extreme shortage. Nevertheless, they also have problems of searching in Thai and English. First, they are not able to spell the words correctly all the time. Second, the searching results by using English or Thai are sometimes not familiar with the cultural context of Lao. However, as they cannot make the right spelling of Thai words for most of the time, searching for PTs is still full of challenges.

Notwithstanding, problems of using ICT claimed by our participants can also point to the weak foundation of the education of Laos. The current education cannot provide its citizens with the ability to carry out in-depth understanding and analysis in their mother tongue.

New technology to clear barriers of gaining advanced ICT skills

In the past, at least the basic coding skills and programming knowledge are needed for software development. Nowadays, new tools have been developed to enable teachers, even without training in programming skills, to create teaching materials and instructional module consuming little amount of time. To teacher education in underdeveloped countries like Laos, programming software of this kind can be introduced into some ICT classrooms of which the learning objective is to use ICT to support teaching to create educational content in pedagogically meaningful ways.

Mobile learning: the more effective way of ICT integration than computers

Based on the findings of this study and the preceding discussion, we argue that mobile-supported education activities and learning materials should be the focal point of ICT in teacher education in Laos, not only because there is less difficulty for individual TEs and PTs to access to mobile broadband and to possess mobile devices than other ICT products, but also because of the all-inclusive functions of mobile phone can make it a useful tool both in education and in daily life. As ITU reveals in its latest ICT Facts and Figures that mobile coverage has reached about 95% of the global population, mobile learning has great potential to lead the new tendency of education technology.

Educational Apps in Lao language should also be developed whilst promoting mobile learning. To make communication more efficient and cultural friendly, considering the internet connection and the inconvenience for Lao people to type on their mobile computing devices, the development off-line Apps should be encouraged (or through other transmission of information like Bluetooth) and dialogues in the Apps can be based on the form of multiple choices selection instead of inputting characters.

Mobile learning which enables more practices can be the impetus of more advanced stages of ICT integration. The lack of practices is one of the major underlying reasons bring challenges to ICT integration in teacher education. For instance, typing in Lao on different ICT products is a common burden

for most Lao people. PTs complained that they are not able to find the letters easily even though the keyboards in the school computer labs have already pasted with stickers of Lao alphabets. They said they feel more comfortable to type on the mobile phone screen and the internet for the mobile phone is even faster than the computers. Therefore, the effectiveness of mobile learning lies in its convenience of being portable and bringing fewer difficulties in inputting.

5.5. Limitation

Despite covering a wide range of description and issues of ICT integration in a teacher training college in Laos, this study is not able to escape from the limitation stated by Lunenberg, Dengerink and Korthagen (2014) that concentration on the organization of teacher education has overshadowed the development of deeper understandings of those that work within the system.

Also, as English was the major medium language with some Chinese and Korean and the researcher was not able to understand and interpret the original texts in Laos, the study could not go deep inside of TEs and PTs' experience and perception about ICT.

In order to improve the accuracy and credibility of the study, member check was done, though not to every participant of this study. After the interview scripts were re-constructed into narrative stories, they were sent to the selected participants through iMessenger (as they preferred) including the interpretation of the text.

CHAPTER VI. CONCLUSION

To conclude, ICT has integrated at different levels and dimensions of teacher education in Lao PDR in different stages, along with tangible achievement and challenges. The continuous professionalization of TEs and PTs is the key factor of a careful design and a smart implementation of integration of ICT in teacher education.

Although this study has described and identified how ICT is integrated and changing the landscape of school environment, infrastructure and curriculum and how it is transforming teacher educators, pre-service teachers and relevant persons' perception on education and the way they conduct educational activities, it can not guarantee ICT integration an appropriate method for sustainable increment of quality teachers in the current context of Lao PDR. The recent development of ICT integration in teacher education curriculum of Laos has only started for two academic years. The experience with ICT began usually within half a decade. These all require further research to examine and explore the outcomes of ICT integration in a longer term.

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APPENDICES

Appendix 1: Survey of teacher educators' perception, behaviors and knowledge of ICT in TTC

1. College/major

2. Age
20 40 60

3. Sex
 Female
 Male

4. Work as teacher educator in TTC since (year)

5. I have been sufficiently trained in basic ICT skills/knowledge

Totally DISagree	DISagree	No idea	Agree	Totally Agree
☆	☆	☆	☆	☆

6. I have been sufficiently trained in how to use ICT in my teaching.

Totally DISagree	DISagree	No idea	Agree	Totally Agree
☆	☆	☆	☆	☆

7. The ICT infrastructure in this Teacher Training College is functioning well

☆	☆	☆	☆	☆
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8. I am using ICT in my teaching and learning.

☆	☆	☆	☆	☆
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9. I am using Internet for accessing and sharing of knowledge and experience

☆	☆	☆	☆	☆
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10. I am using the Internet for my professional development through online learning/ distance education

☆	☆	☆	☆	☆
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Appendix 2: Buildings and the Function of LPB TTC

No.	Floors	Function
1	2	Administration Building: located in the southeastern corner of the southern campus, it has two floors on which there are the offices of the principal, the dean, division of teaching and research, ICT, general affairs, reception office and a meeting room with projector and screen. Administrative staffs and TEs who also have administrative work have their offices in this building. Most of the staffs work with laptops instead of desktops. The majority are personal laptops. Only a few of them are possessed by the school.
2	1	Library (including an English Center and PC lab): is the first building on the right hand side after walking into the south campus. Removing the English Center and the e-reading room, the remaining space is similar to the size of two classrooms. It is more of a reading room than a library as most of its space is taken by the desks. It can hold up to 80 seats. Book shelves are put deep inside of the room. For some research courses, TEs will take the students to library to give the lesson for information searching. The English Center in the library has around 4000 books, a part of which are in complete English donated by Australian voluntary programs.
3	1	Classrooms
4	3	Classrooms and department office of Foreign Language (B1-2F)
5	3	Classrooms and department office of Social Science (B1-2F)
6	3	Classrooms, labs and department office of Natural Science
7	2	Classrooms, Entertainment room and department office of Primary and Preschool Education
8	1	Classrooms
9	4	Female students' dormitory
10	4	Male students' dormitory There are two dormitory buildings in the east corner of south campus. Both of the buildings have four floors which were used as teaching buildings before the expansion of the campus. The dormitories have electricity connection but no internet. Usually, 8 PTs share one room. It has no suitable or enough space for PTs to study their coursework. Some TEs live on campus as well. They stay in the same dormitory building as the students. There are single rooms for them on the first floor with cable TV connection. They can also cook in the room. PTs who are local Luang Prabang residents sleep at home and they usually come to school by motorbike. There are two parking lots, one between the library and the administration building and the other behind Building No. 8.
11	1	Hall

Appendix 3-1: Information of Full Class Observation

Course	Lao Language Pedagogy	Teaching ICT	Education Management	
Date	27 th Sep	27 th Sep	27 th Sep	
Time	8:00-9:40	9:50-11:30	1:30-15:10	
Object	Using pedagogical methods to teach Lao language	Using different materials and study group to teach ICT	Being familiar with administrative knowledge and skills	
Outcome	Being able to understand UbD and use it to make course plan.	Making ICT lesson plans and to practice teaching in classroom	Being able to deal with administrative affairs and contribute to Lao community communication and development	
Tools	TE	Power stripe and projector		
		personal laptop (Toshiba), pointing stick and printed sample report	personal laptop (Mac), and Wi-Fi egg	personal laptop, computer speaker
		Teaching materials: PPT(4:3), a Word document, a PDF file, no textbooks or online resources	PPT(16:9), online-website, e-learning database	PPT(4:3), video, textbooks
	PTs	mobile phones (some are smart phones, some are not), stationaries		
		laptop		
Rules	1. Classroom discipline 2. Trending requirement of secondary teaching	1. Group study		
Community	2 nd year students class of Lao language	3 rd year students class of ICT Education	4 th year students class of Natural Science	
Community Environment	Classroom size 6.9m*9.6m; blackboard size 400cm*120cm (estimated by the eye); 2 wall sockets on every corner of the classroom			
	projection size 120cm*90cm by the eye ² ; Pink cloth curtains ¹ ; As there is no projection screen installed, the 4:3 format projection directly flashed up on the left-center part of the blackboard; 16 long desks (3 lines, 5 rows); each desk two seats	8 study groups of three or four; Facebook online group founding; group photo taken as cover pic		
Division of Labor	1 teacher educator; 32 PTs (20 female)	1 TE; 30 PTs (one absent, 12 female)		

Appendix 3-2: Samples of Observation Field notes

Class observation - O¹

At 8 : 00, the TE entered the classroom carrying with a projector, a laptop and a power stripe. It took her around 5 minutes to turn on the laptop, set the projector and open the PPT file for the course. When the projection appeared, students sitting next to the windows stood up and put the curtain knotted curtains down. The curtains were in pink, made of cloth¹. As there is no projection screen installed, the 4:3 format projection directly flashed up on the left-center part of the blackboard. The size of the blackboard was estimated as 400cm*120cm, and the projection was 120cm*90cm by the eye². The power stripe was connected to the right front corner of the classroom. It was very long and was just across the active area of the TE. She looked down on the floor for several times. A male ST sat in the very left back corner use the nearest socket from him to charge his phone. In class, when the TE showed a new slide, some students would use their phones to take photos instead of notes. If some PTs did not have a good view of the projection from the seat, they passed the mobile phones to the one who could take better photos. When the TE was drawing the mind map on the blackboard, screensaver photos seeming to be the TE's daughter were displayed in a slide show mode on the blackboard. Some PTs burst out into laughter but soon refrained from making loud noise. The TE didn't notice and continued drawing until she turned around and saw the screensaver of her laptop. After finishing the exercise of mind map, she opened the Word document to show the framework of using UbD to make course plan. All the materials she presented were in Lao language. The TE ended the class at 9:00 and asked the PTs to studied on their own for the rest 40 minutes.

Appendix 4-1: Samples of Interview Narratives

Narrative of Somphone Phonpaseyth - I₂

I'm in the 3rd year of ICT Education in LPB TTC. We are the first grade of students of the ICT Education in this college. I was born in 1992. My hometown is in Chomphet District, LPB Province. I would like to study to be a teacher because I want to help the children in my district. I will return back to my district to teach. My family is poor. In order to earn my tuition fee, I have a part-time job in Daofar nightclub. I am the lead singer in the band. Now, I live with my brother who works in a hotel in LPB. When I was in my secondary school, my parents bought me my first mobile phone. It was very small. Now I have my own smart phone. The first time for me to use and learn computer was about 4 years ago. The first time I used it, I knew that Oh I like it and I want to learn it! I could use computer there for free.

Now, in my free time, I like playing Kataw ball. It is a small ball. We use the foot, hand and knees to play it. I also like using computers. I usually use Google in Thai or English to search for information most of the time. I love watching videos on YouTube, and also watch some instructional videos to learn programming and using Photoshop. When I have troubles on computers or other electronic devices and when there is nobody like the teachers for me to ask for help, I always sort for help in YouTube. Most of these videos are in Thai, showing us the steps to install and use a software or fix a problems of computers. They are really helpful and powerful. Most of the time, I can find the answer I want.

There are 2-3 training centers teaching ICT in LPB. Last summer vacation, Noy and I went to the Make Savanh Computer Center to have a 3-month training about programing. The course was 4 hours per week, from 8:00 to 10:00am everyday on weekends. So that's 48 hours totally. The training fee was 600,000 kip (equals to USD 74). It was expensive for us but we need to improve ourselves. Our trainer, Mr. Bouhoun was very good at programing. Our teacher in LPB TTC, Mr. Sithisack is also good, but he is better at website. The facilities in the Computer Center are similar with the ones in TTC. One thing I want to add is I still think that the skills of the ICT teachers in TTC are not enough. In TTC, we have the general course about ICT but the skills of the teachers are not able to support them go deeper and help the students get more knowledge.

After 2 years, I will teach in a secondary school. There will be lots of challenges and I think most of the difficulties will be about the access to the internet, computers and the programs in it and the functioning of the school website and database. Also, there must be new knowledge about ICT, so we need to never stop studying to keep up with the latest technologies. But sometimes it may be difficult or slow for me to learn and understand all.

I have a strong will to study more and study abroad. I think right now my English is quite bad. I want to improve my English because being good at English should be the premise of learning well of the computers. I also want to study more languages. I want to study Korean and study in Korea as well because Korea is very strong in making mobile phones and computers and all different kinds of software and games. However, I don't know how I can realize my dream. I don't have enough time to study. It seems to be just a dream and so far away from me.

Narrative of Noy Xaiyaphon - I₃

I was 19 years old. I was born in LPB District, LPB Province. I dreamed to be a teacher when I was a kid. In my spare time, I like riding the bicycle around the town. The first time I started to learn about computers was in LPB TTC 2 years ago, the time when I became the student in TTC. I was really excited to use it the first time, because I have never touched it before. I chose to study this major because I like it and I think computer is very important in the society.

There are many computer centers in LPB. During the summer vacation, Somphone and I studied together in a computer center because we thought we were lack of computer knowledge and skills.

In my secondary school, my father bought me my first phone. It was a Nokia. It can only call and send message. At that time, there was no Lao language system in the phone so we use the English letters to represent the pronunciation of Lao words. Now I have a smart phone. The most useful app for me is Google. I also chat with my friends by using the apps on the mobile phone and share some information, not just talk, share some pictures, videos and links. In our ICT lesson, we have an online study group on Facebook, we can share lots of things there. But we only start it this semester. We are also taught about it the curriculums and textbooks used in the secondary schools in TTC.

Narrative of Chorlee Nengyakhoualee

I'm 21 years old, now in my 4th year of the math education of the Natural Science Department. There are 35 students in our class. 11 of them are girls and the rest 24 are boys. We need to learn not only math knowledge but also the curriculum of high school and the pedagogy to teach math. We also have courses of research and report in which we learn the methods and skills to search for academic information and write reports.

I have two sisters, one is a chef, and the other works in the hotel. I also have two brothers. One graduated from the Engineering Department of Souphanouvong University, but he is still looking for a job. The other brother is currently studying in National University of Laos. My father passed away when we were very young. As a result, we were sent to an orphanage called Van Kutineng. I stayed there for 7 years until I was funded by an Australian sponsor about 6 years ago. Next month, we are going to move to a new village which has no running water. It is very far from the school and the road is very bad. The village is new and few people live there. I don't want to move to that place but I have no choice.

The first time for me to learn to use computer was four years ago. That was the last year of high school. I learned it in a place called the Big Mouse Library. We can use computers there for free. Now, I have my phone and I buy the 10,000 KIP 3G card to use Internet on my phone but not every week.

Every student will have the opportunity of teaching practicum for one-week from 7th to 11th Nov. I'm very nervous about it. Because if I cannot pass it, I may not be qualified to the intense 12-week training for PTs since next February.

Narrative of Kou Vangmoua - I8

제 이름은 꾸입입니다. 오늘 만나서 참 재미있습니다. 저는 한국에서 온 교수님한테 한국어를 배웠습니다. 그리고 스스로도 배웠습니다. 왜냐하면 저는 한국에 여행을 가고 싶습니다. 루앙프라방에서는 매년 한국장학금이 있어서 한국에 유학 가는 것도 제 꿈입니다. 시간이 있을 때 저는 수파누번 대학교에서 있는 한국센터에 자주 가서 한국어를 열심히 공부합니다. 푸씨산을 등산하는 것도 좋아합니다.

그런데 요즘 너무 바빠서 한국어 공부를 못 합니다. 매일 저녁 4 시반부터 6 시반까지 Mekong English Center 에서 2 시간 동안 영어 공부를 합니다. 유학을

가려면 영어도 너무 중요합니다.우리 학교 숙제도 많아서 매일 숙제도 잘 완성해야 해서 너무 바쁩니다.

11 월 첫 췌 주에는 우리 정공 선생님들이 다 고등학교에서 화학 수업을 가르치러 갑니다.이런 경험은 아주 좋습니다.드리어 학교 선생님이 될 수 있겠습니다.그런데 라오스에서 가르치는 것보다 한국에서 유학하는 것을 더 원합니다.

Narrative of Ting Xaiyasouk- I₁₃

My name is Ting Xaiyasouk. I'm 20, from Xieng Ngeun district. I want to be a kindergarten teacher because I love children and would like to help the children in my province. There are lots of lovely children in the kindergartens. Most of the time, they play and learn from the toys and stories. For people like us who would like to be kindergarten teachers need to understand more about the children, learn how to take care of them, have the skills to make toys, tell short stories and different materials for the children. For making the toys, teachers can use the internet to find the pictures, print them or draw them. For stories, we use the internet to search for pictures which go well with the stories. Thus, it's very important to know how to search and use the internet.

I study hard because there are lots of challenges more than most people think. When we teach Lao language, according to the preschool education curriculum, teachers need to help the children develop the understanding of the objects by comparing the Lao one and the foreign one. So we need learn how to make materials of animals, fruits, flowers and vegetables which have never been seen by Lao people or don't exist in Laos before to show the children. But the problem is, the children can only know about the objects through the name or the pictures, it's quite hard for the children to see and recognize them though more and more new things can be imported from the overseas nowadays. Now ICT here help us to search for more information about the objects and make materials for teaching quicker and better than before. But I still find it hard to teach.

Anyhow, when I become a teacher, I would like to use the computer, connect it to the internet and use the Facebook to download information, help me make lesson plans and post them on the Facebook so that all the other teachers can download them. I will also let the children know that there are some educational games

available on the mobile phones that we can learn from. But using ICT really hurts eyes. I need to tell them about the harm that it may bring and encourage them to use it in a good way.

I have a smart phone. I use it in many situations, including learning and teaching. First, I use the Facebook to chat with friends, talk about the homework in group and ask for information with each other. Second, I use it to search for information.

Although not many information is in Lao, as I can understand and type in Thai, I don't feel much difficult or inconvenient to search on the internet for the information I want. For example, if I need to teach about the apple, I will type in Thai to search for pictures and videos about it. 90% of the Lao people can understand about Thai language.

In the last year of high school, I learned about using MS office. I also learned to draw by using the computer and internet. But the computers in our secondary school were not enough for all students. There were more than 40 students in our class, but only 4 or 5 computers. We tried to learn in groups. We had only two hours to study in class per week.

Narrative of NTI -I₁₇

I'm from LPB province. My major is Lao Language. Some of our teachers like to use the PowerPoint and the projector to teach but not all. It depends on subjects or the teachers of how often they would like to use it in class. Some teachers always use the projectors while others never. Students sometimes use our mobile phones in the classes to take photos of what they show to us. We also use the mobile phone to search for information.

I've never used the computers in the secondary schools. Comparing the situation of the past and present, I think ICT knowledge is updated very quickly. Now we have ICT courses in the secondary curriculum and by learning the skills, students can get a better grade in the class. The TEs here in LPB TTC generally have good techniques to teach the students. We can also understand well in their class.

Nang Somephet - I₂₀

I have been teaching in this school for two years since 2014 right after I graduated from Faculty of Computer Science in SU. I was admitted to SU in 2009 and that was also the first time for me to learn about computer. When I was in the

secondary school, I've never used the computer. In SU, I mainly learned about the website. We have Wi-Fi in SU but it is only available in the computer room. Some teachers cannot teach well. They cannot understand everything they teach. Some old teachers are good but there are not many. And this ICT Department in SU is very new. It was established 7 years ago, in 2009. Teachers only teach the basic computer knowledge. I have never thought about the question whether I want to improve my ICT skills and which part I want to improve. I don't know what else there is beyond what I learned about computer science as we were only taught about the basic skills.

If there is a chance for me to have training about computer skills in Laos, I would like to know more about the programming and software. The computer classes in SU didn't give us much time to practice. We only listened to the teachers in class and looked at the pictures they showed, but the practice, no. The computer labs don't have enough computers for every student. We can only sit in groups. 4-6 people one group. Only one or two people in each group are able to use the computer in class. So there are not enough computers for practicing. Now I teach in LBP TTC. I usually find information for teaching. When I studied in SU, we usually download PSP, SPL which are used to support the website.

Now I have a family and a cute daughter. If there is a chance for to study abroad, I think there will not be many problems for me. My family will not be a burden for me. My parents and my husband's parents can look after our kid. And my husband can also teach our kid. I would like to take the opportunity to go studying abroad. My husband is a teacher in SU. We have a computer at home. When I have problems in computer, I usually ask my husband and colleagues in ICT workgroup for help. However, normally, I ask my husband.

When I teach in class, if I have the textbook, I make the PPT slide. I don't make it alone. The workshop we work on this together, step by step within the group. In terms of the assignment I give to me student, for each course, the student will be asked to work in 3-4 to finish the report. So they need to use the computer to finish. In this way, they can learn about how to use ICT to teach. Regarding distance learning or e-learning, I've never heard about it.

Appendix 4-2: PTs' Positive First Experience of ICT

(1) The first time for me to use computer was 3 years ago, when I was 17 years old in **high school**. I learned it all by myself but I sometimes watched my brother working with the computer. We have a computer at home. My brother is 3 years older than me and he is a policeman. He needs to use computer in his work. The first phone I have was also in high school. **NTI-I₁**

(2) When I was in my **secondary school**, my parents bought me my first mobile phone. It was very small. Now I have my own smart phone. The first time for me to use and learn computer was about 4 years ago. The first time I used it, I knew that Oh, I like it and I want to learn it! **Somphone Phonpaseyth - I₂**

(3) In **secondary school**, my father bought me my first phone. It was a Nokia. It could only make phone call and send message. It had no Lao language system so we use the English letters to represent the pronunciation of Lao words. The first time I started to learn about computers was in LPB TTC 2 years ago, the time when I became the student in TTC. I was really excited to use it the first time, because I have never touched it before. **Noy Xaiyaphon - I₃**

(4) I was 13-year old when I first learned about computer. I can clearly remember it because it was a big moment in my life: I left my village and moved to live in the temple in the city. I couldn't say learn about computers. I just used the computer of my friend who lived in the same room with me. **Joy -I₅**

(5) The first time for me to use computer was in my 5th year of secondary school. But I didn't learn it at school. Instead, I learned in 'My Library'. Its owner is from the US. It's **free** to use the computer there, one person one hour per day. So if you go there every day, you can use it for one hour every day. I went there sometimes but not always. **Tearnoy -I₄**

(6) The first time for me to learn to use computer was four years ago. That was the last year of high school. I learned it in a place called the Big Mouse Library. We can use computers there for **free**. **Chorlee Nengyakhoualee -I₇**

Appendix 4-3: PTs' Negative First Experience of ICT

(7) ... I was really worried that it would be broken and was afraid to use it.

Bounniaw Lor- I₆

(8) I'm from the Xieng Ngeun district of LPB Province. I started to know about computer in 2014, the last year of secondary school. But I first learned to use it in LPB TTC in 2015, about the basic Microsoft Office software. **NTI-I₁₁**

(9) The first time for me to take computer courses was in the 3rd year in LPB TTC. Before that, I studied by myself. I had lots of problems to learn it for the first time. I didn't even know how to turn it on and shut it off. **Kou Vang -I₁₆**

(10) I started to know about computers at the last year of high school. At that time, I learned about the Microsoft office as school. After that, I didn't have chances to study about computer again. **Porvue Chandeevue- I₁₂**

(11) Although I had experience of using computers before I came to LPB TTC, I only knew how to turn it on, shut it off or type some Lao or Thai. We prefer to type and download the documents in Thai to make it go well with the systems as most of them don't recognize Lao language. When I type, it took me a long time because it's hard to find the letters on the keyboard. **Miss Moun-I₁₅**

(12) The first experience for us to use the computer was two years ago, in our ICT class in LPB TTC. We were very excited although we didn't know how to use it. Neither of us have personal computer or laptops. We only use the one at school. But both of us have smart phones. **Chemistry Education - G₄**

Appendix 5: School Statements (Lao)

I. ວິໄສທັດ

“ວິທະຍາໄລຄູຫຼວງພະບາງສ້າງວິຊາຊີບຄູສູ່ຄວາມເປັນເລີດປະເສີດດ້ວຍຄຸນນະທຳສົ່ງເສີມ ວັດທະນະທຳທີ່ເປັນເອກະລັກພັດທະນາສິ່ງແວດລ້ອມສ້າງຄວາມພ້ອມກ້າວສູ່ສາກົນ.”

II. ເປົ້າໝາຍ

1. ເພື່ອແຜ່ຂໍ້ມູນຂ່າວສານໃຫ້ແກ່ພະນັກງານ, ຄູ-ອາຈານ, ນັກສຶກສາ, ບຸກຄະລາກອນການສຶກສາແລະຊຸມຊົນໃນເຂດບໍລິການໄດ້ຮັບຮູ້, ເຂົ້າໃຈ.
2. ນັກສຶກສາຄູຜູ້ຮຽນຈົບກາຍເປັນບັນດິດທີ່ມີຈັນຍາບັນແລະຄຸນນະທຳພ້ອມຮັບໃຊ້ສັງຄົມ.
3. ໄດ້ຮັບຮອງເປັນສູນແຫ່ງການພັດທະນາລາຍວິຊາພິຊິກສາດ, ຊີວະສາດແລະພາສາອັງກິດໃນປີ2020.

ເປັນສະຖານສຶກສາທີ່ສົ່ງເສີມວັດທະນະທຳທີ່ເປັນເອກະລັກແລະປົກຫຸ້ມດ້ວຍສິ່ງແວດລ້ອມ
ສີຂຽວງາມ.

III. ພາລະກິດ

1. ບັບປຸງຫຼັກສູດສ້າງຄູໃຫ້ສອດຄ່ອງກັບຫຼັກສູດສາຍສາມັນແລະຄວາມຕ້ອງການຂອງ
ສັງຄົມ.
2. ຍົກສູງຄຸນນະພາບວຽກງານວິຊາການແລະວິຊາຊີຢ່າງຕໍ່ເນື່ອງ.
3. ພັດທະນາລະບົບຄຸ້ມຄອງ, ບໍລິຫານການຮຽນ-ການສອນໃຫ້ມີປະສິດທິພາບໃກ້ຄຽງ
ມາດຕະຖານສາກົນ
4. ຍົກວຸດທິຂອງຄູໃຫ້ຕອບສະໜອງຕາມແຜນ1:6:3 (ປະລິນຍາເອກ:ປະລິນຍາໂທ:
ປະລິນຍາຕີ)
5. ບັບປຸງແລະພັດທະນາແຫຼ່ງການຮຽນຮູ້
6. ດຳເນີນການວິໄຈເພື່ອເປັນແນວທາງໃນການພັດທະນາແລະສ້າງຄວາມເປັນເລີດໃນວິຊາ
ຊີບຄູ
7. ສ້າງຕັ້ງເຄືອຂ່າຍຄູ່ຮ່ວມພັດທະນາທາງດ້ານວິຊາການ, ການບໍລິຫານ, ການປະກອບການ,
ສິດທິແລະການເກັບກຳຂໍ້ມູນນັກສຶກສາທີ່ຮຽນຈົບທັງພາຍໃນແລະຕ່າງປະເທດ
8. ສະໜອງການບໍລິການດ້ານວິຊາການໃຫ້ແກ່ສັງຄົມ
9. ປູກຝັງຈິດສຳນຶກໃຫ້ນັກຮຽນມີຄຸນນະທຳ, ເຫັນຄຸນຄ່າວັດທະນະທຳທີ່ເປັນເອກະລັກຂອງ
ທ້ອງຖິ່ນ
10. ພັດທະນາສິ່ງແວດລ້ອມໃຫ້ສະອາດຂຽວງາມ, ສ້າງສິ່ງເອື້ອຍອ່ານວຍໃຫ້ແກ່ການຮຽນ-
ການສອນ

ພາລະບົດບາດ

ວິທະຍາໄລຄູຫຼວງພະບາງມີພາລະບົດບາດໃນການປະຕິບັດຕາມຍຸດທະສາດແລະນະໂຍບາຍ
ຂອງການສຶກສາໃນໄລຍະໃໝ່ທີ່ກະຊວງສຶກສາແຫ່ງສປປລາວວາງອອກໂດຍສະເພາະກ່ຽວ
ກັບການກໍ່ສ້າງແລະການບຳລຸງຍົກລະດັບຄູໃຫ້ມີຄຸນນະພາບດີເພື່ອຮັບໃຊ້ແກ່6 ແຂວງພາກ
ເໜືອ.

ໜ້າທີ່

ວິທະຍາໄລຄູຫຼວງພະບາງມີໜ້າທີ່ປະຕິບັດຕາມແຜນຍຸດທະສາດການສຶກສາຂອງພັກ
ກໍ່ຄືແຜນຍຸດທະສາດການສ້າງຄູຂອງກະຊວງສຶກສາທີ່ການແລະກົມສ້າງຄູ. ບົນພື້ນຖານ
ແຜນຍຸດທະສາດດັ່ງກ່າວວິທະຍາໄລຄູຫຼວງພະບາງໄດ້ຜັນຂະຫຍາຍເປັນໜ້າທີ່ສຳຄັນດັ່ງນີ້:

ມີໜ້າທີ່ກໍ່ສ້າງຄູລຸ້ນປະຖົມສຶກສາແລະອະນຸບານໃນລະບົບ11+1ແລະ11+2ໃຫ້ແກ່2ແຂວງ
ຫຼວງພະບາງແລະໄຊຍະບູລີ, ສ້າງຄູລຸ້ນສູງສອນໃນລຸ້ນມັດທະຍົມສຶກສາ5ສາຍແລະບຳລຸງຍົກ
ລະດັບຄູທີ່ຮຽນຈົບລະບົບ11+3ໃນລະດັບປະລິນຍາຕີຕໍ່ເນື່ອງໃນແຂວງພາກເໜືອ.

ມີໜ້າທີ່ກໍ່ສ້າງ, ຈັດຕັ້ງການສຳມະນາ, ເຜີຍກອບຮົມແລະຍົກລະດັບວິຊາການໃນດ້ານ
ຕ່າງໆໃຫ້ແກ່ຄູອາຈານແລະພະນັກງານທັງພາຍໃນສະຖາບັນແລະພາຍນອກເພື່ອເພີ່ມ
ປະສົບການໃຫ້ເຂັ້ມແຂງກ້າວໜ້າຂຶ້ນເລື້ອຍໆ.

ມີໜ້າທີ່ພົວພັນປະສານງານກັບທຸກໆພາກສ່ວນແສດຖະກິດສັງຄົມ, ອົງການຈັດຕັ້ງ
ສາກົນ, ສະຖາບັນສ້າງຄູໃນທົ່ວປະເທດມະຫາວິທະຍາໄລທັງພາຍໃນແລະຕ່າງປະເທດ
ພັດທະນາຫຼັກສູດໂຄງການໃຫ້ກ້າວໜ້າແລະຂະຫຍາຍຕົວຢ່າງບໍ່ຢຸດຢັ້ງ.

ມີໜ້າທີ່ສຶກສາອົບຮົມນັກສຶກສາໃນການປົກປັກຮັກສາແລະເສີມຂະຫຍາຍສິລະປະ
ຮີດຄອງປະເພນີແລະວັດທະນະທຳອັນດີງາມຂອງຊາດກໍ່ຄືຂອງທ້ອງຖິ່ນໃຫ້ຍືນຍົງຄົງ
ຕົວຢ່າງບໍ່ຢຸດຢັ້ງ.

Appendix 6: Curriculum of Basic ICT

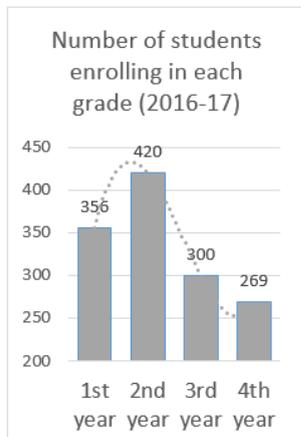
No	Courses	Credit	Class Hour Theory-Activity- Assignment
1st Year 1st Semester			
1	Basic Computer 1	1	0-2-0
2	Technology in Everyday Life	2	1-2-0
3	Applied Lao Language	3	2-2-0
4	English 1	2	1-2-0
5	Political Science 1	1	1-0-0
6	Educational Technology	2	1-2-0
7	Mathematics for Computer	3	3-0-0
8	Basic Technical Knowledge	3	2-2-0
9	Art Engraver and Decorations	2	1-2-0
10	Security	2	2-0-0
	Total	21	14-14-0
1st Year 2nd Semester			
1	Basic Computer 2	1	0-2-0
2	Basics ICT	2	1-2-0
3	Sports	3	2-2-0
4	Applied Mathematics	3	2-2-0
5	National Defense and Security	1	0-0-6
6	English 2	2	1-2-0
7	Political Science 2	2	2-0-0
8	University General Psychology	2	2-0-0
9	Operating System	3	2-2-0
10	Internet	1	0-2-0
	Cooking and Services	2	2-0-0
	Total	22	14-14-6
2nd Year 3rd Semester			
1	Basic Computer 3	1	0-2-0
2	Cultural Heritage of Laos and ASEAN	2	2-0-0
3	English 3	2	1-2-0
4	Political Science 3	2	2-0-0
5	MIS	3	2-2-0
6	Website Development	3	2-2-0
7	Basic Programming	4	2-2-4
8	Human Relationship	2	2-0-0
9	Garments	2	1-2-0
	Total	21	14-12-4
2nd Year 4th Semester			
1	Basic Computer 4	1	0-2-0
2	English4	2	1-2-0
3	Curriculum Analysis of Lower and Upper Secondary School	4	2-4-0
4	University Social Psychology	2	2-0-0
5	Experience 1	1	0-2-0

6	General Education 1	2	1-2-0
7	Information System	3	1-2-4
8	Management Database	3	1-2-4
9	Metallurgy	2	2-0-0
10	Civil Engineering	2	2-0-0
	Total	22	12-16-8
3rd Year 5th Semester			
1	English 5	2	1-2-0
2	ICT Teaching Method 1	2	2-0-0
3	Experience 2	1	0-2-0
4	General Education 2	2	2-0-0
5	University Development Psychology	2	2-0-0
6	Software Application for Documents Management	3	2-2-0
7	Computer Graphics	2	1-2-0
8	Communication Technology	2	1-2-0
9	Farming and Cultivation	2	2-0-0
10	Woodwork	2	2-0-0
11	Drawing	2	1-2-0
		22	16-12-0
3rd Year 6th Semester			
1	Basic ICT 2	2	0-4-0
2	Experience 3	1	0-2-0
3	Education Administration	2	2-0-0
4	Network and Computer Security	3	2-2-0
5	Applying Software for Research	2	2-0-0
6	Livestock Farming	2	2-0-0
7	Electricity	2	1-2-0
8	AutoCAD Software	2	1-2-0
9	E-learning / Basic Vocational English	4	2-4-0
		20	12-16-0
4th Year 7th Semester			
1	Research	3	2-2-0
2	Measurement and Evaluation Studies	2	2-0-0
3	Using ICT in Teaching	4	2-2-4
4	Invention and Manufacture	4	2-2-4
5	Computer Assisted Instruction	4	2-2-4
6	Car mechanic	2	1-2-0
7	Business	2	1-2-0
	Automobile Mechanics	21	12-12-12
4th Year 8th Semester			
1	Final Report	2	0-0-12
2	Teaching Practice	9	0-18-0
		11	0-18-12

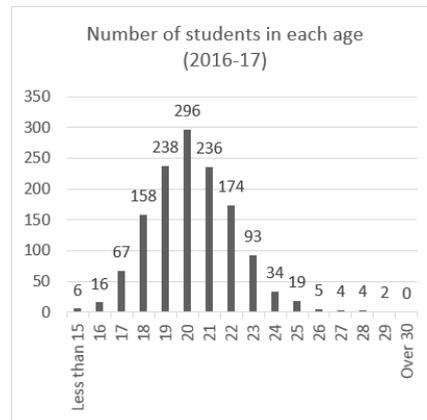
Sources: (for syllabus of other majors, also see) <http://luangprabang-ttc.edu.la/temis-report-web/general/subjects.php>

Appendix 7: Quantitative Data of Luang Prabang Teacher Training College

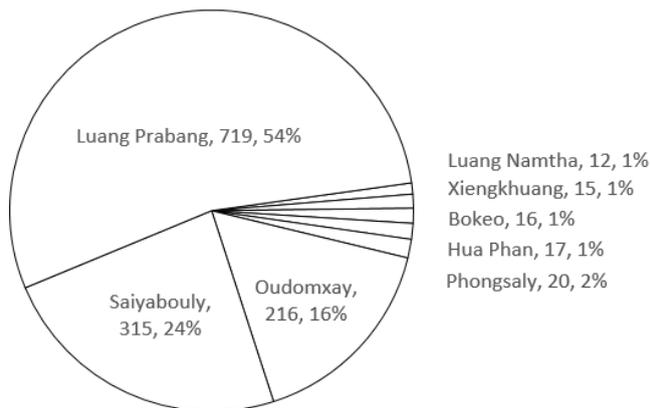
1.1. Enrollment of PTs in each grade



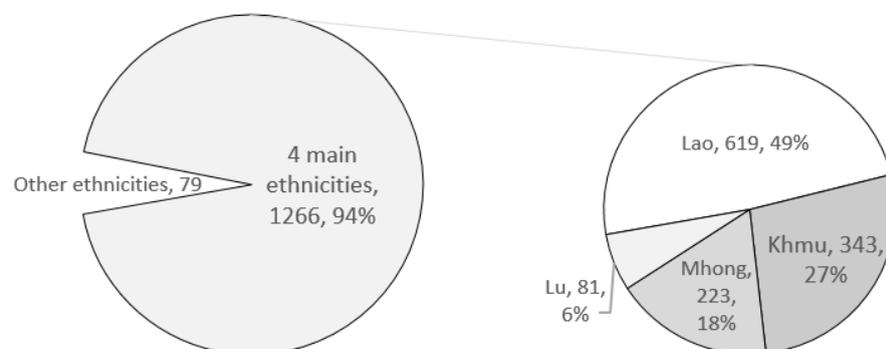
1.2. Number of PTs in each age



1.3. Number of PTs from 8 northern provinces



1.4. Proportion of students of major ethnicities in LPB TTC

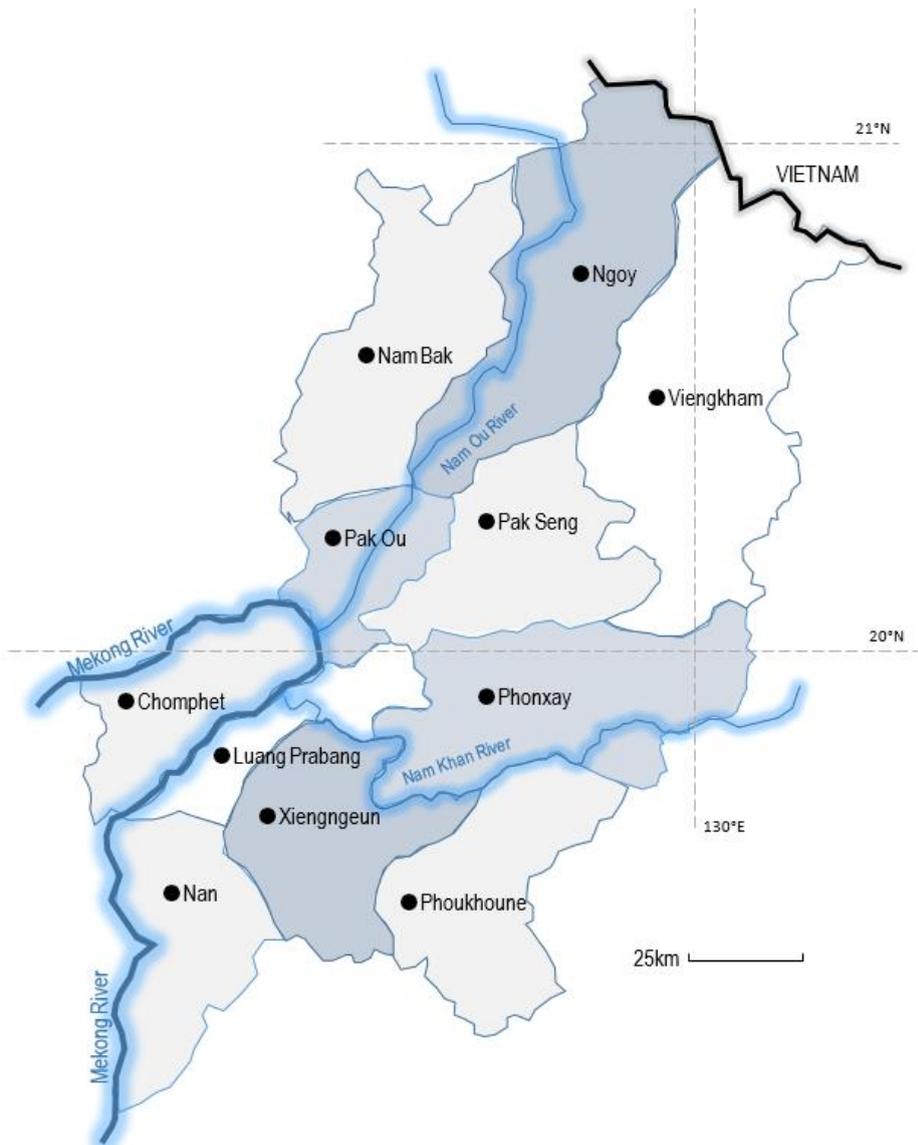


1.5. Educational qualification of faculty members

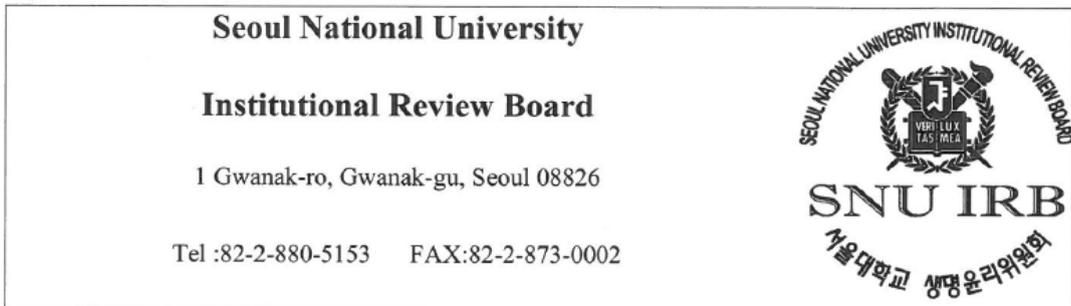
	Offices/departments	N/A	Primary	Intermediate	Diploma	Bachelor	Expert	Master	Total	Administrative position
1	Evaluation office	-	-	-	-	11/5	-	3/1	14/6	5/1
2	Academic office	1/1	1/1	-	3/2	15/9	1/-	5/3	26/16	17/12
3	Teacher development office	-	-	-	-	4/4	-	3/2	7/5	5/4
4	Student affair office	-	-	-	1/-	10/7	-	6/-	17/7	11/4
5	Administration-finance Office	1/1	-	3/-	6/5	12/3	-	3/1	25/10	17/6
6	Personnel Division	2/-	2/1	-	-	3/1	1/1	6/-	14/3	14/3
7	Foreign language	-	-	-	1/1	17/1	-	2/1	20/3	4/1
8	Natural science	-	-	-	-	16/6	-	1/1	17/7	6/3
9	Social science	-	-	-	-	18/9	-	2/1	20/10	8/5
10	Primary and kindergarten	-	-	-	5/5	8/5	-	1/1	14/11	6/3
	Year 2016-17	4/2	3/0	3/0	16/14	114/60	2/1	32/11	174/88	93/42
	Year 2014-15	4/2	3/2	3/0	16/14	123/61	2/1	26/11	177/90	96/43

**Numbers can be interpreted as (Total /female)*

Appendix 8: Map of Luang Prabang Province and Districts



Appendix 9-1: Approval Document of Institutional Review Board
(English Version)



July 22, 2016

Yikun You
Graduate School of Education,
Global Education Cooperation Major
Seoul National University,
Seoul 08826, Korea

IRB No. 1607/003-007

Title of Proposal: ICT Integration in Teacher Education: A Teacher Training Institute Case in Lao PDR

Approved period of study: 7/22/2016 – 7/21/2017

Dear. Yikun You

This letter is to officially notify you that the Institutional Review Board has reviewed and approved the above referenced protocol to involve humans as research subjects under **an Expedited Category**. If it is necessary to continue the study beyond the approved period, a request for continuation approval should be submitted about 6 weeks prior to **7/21/2017**.

Approval Document of Institutional Review Board (IRB)

(Korean Version)

심의결과 통보서

수신

책임연구자	이름: YIKUN YOU	소속: 서울대학교교육학과글로벌교육협력	직위: 석사과정
지원기관	해당없음		

과제정보

승인번호	IRB No. 1607/003-007		
연구과제명	라오스 사범대학의 ICT 통합에 관한 사례 연구		
연구종류	학위 논문 연구, 관찰연구, 면담(FGI 포함), 공개된 정보를 이용하는 연구		
심의종류	신속심의		
심의일자	2016-07-22		
심의대상	연구계획서(재심의), 연구참여자용 동의서 또는 동의서 면제 사유서		
심의결과	승인		
승인일자	2016-07-22	승인유효기간	2017-07-21
정기보고주기	6개월		
심의의견	<ol style="list-style-type: none"> 1. 심의결과 제출하신 연구계획에 대해 승인합니다. 2. 연구자께서는 승인된 문서를 사용하여 연구를 진행하시기 바라며, 만일 연구진행 과정에서 계획상에 변경사항(연구자 변경, 연구내용 변경 등)이 발생할 경우 본 위원회에 변경 신청을 하여 승인 받은 후 연구를 진행하여 주십시오. 3. 유효기간 내 연구가 끝났을 경우 종료 보고서를 제출하여야 하며, 승인유효기간 이후에도 연구를 계속하고자 할 경우, 2017-06-21까지 지속심의를 받도록 하여 주십시오. 		

2016년 07월 22일

서울대학교 생명윤리위원회 위원장



Appendix 9-2: Approval Document of Ministry of Education and Sport (MoES) of Laos



ສາທາລະນະລັດ ປະຊາທິປະໄຕ ປະຊາຊົນລາວ
ສັນຕິພາບ ເອກະລາດ ປະຊາທິປະໄຕ ເອກະພາບ ວັດທະນະຖາວອນ



ກະຊວງສຶກສາທິການ ແລະ ກິລາ
ກົມພົວພັນຕ່າງປະເທດ

ດ່ວນທີ່ສຸດ

1456

ເລກທີ /ພຕ.ສປ/2016
ນະຄອນຫຼວງວຽງຈັນ, ວັນທີ 20 SEP 2016

ກະຊວງສຶກສາທິການ ແລະ ກິລາ
ກົມສ້າງຄູ

ເລກທີ..M.2.5.....
ວັນທີ 21 SEP 2016

ສະໂໜດນໍາສົ່ງ

ບັນຍາຍ : ທ່ານຫົວໜ້າກົມກົມສ້າງຄູ.

ລ/ດ	ເລື່ອງຂອງເອກະສານ	ຈໍານວນ	ໝາຍເຫດ
1.	ອີງຕາມ : ຈົດໝາຍສະເໜີຈາກມະຫາວິທະຍາໄລແຫ່ງຊາດໄຊ ສ.ເກົາຫຼີ Seoul National University, ລົງວັນທີ 12/09/2016. ກ່ຽວກັບນັກສຶກສາ Ms. Yikun You, ເລກ ປັດສະປ໌ G4434041 ສະເໜີມາເຮັດບົດສໍາພາດບົດຄົ້ນຄ້ວາ ກໍລະນີສຶກສາ: ການນໍາໃຊ້ ໃນວິທະຍາໄລຄູ ຫຼວງພະບາງ ເພື່ອ ເປັນຂໍ້ມູນໃນການຂຽນບົດໂຄງການຈົບຊັ້ນປະລິນຍາໂທ (Master Program of Global Education Cooperation) ມະຫາວິທະຍາໄລແຫ່ງຊາດໄຊ ສ.ເກົາຫຼີ Seoul National University ໃນລະຫວ່າງວັນທີ 26 - 30/09/2016.	1 ຊຸດ	ເອກະສານ ຄັດຕິດ 1 ຊຸດ

ດັ່ງນັ້ນ, ຈຶ່ງຮຽນສະເໜີມາຍັງທ່ານເພື່ອຊາບ ແລະ ດໍາເນີນການຕາມທາງຄວນດ້ວຍ.
ດ້ວຍຄວາມນັບຖື.



ຈັນຕີ ພິມມະບຸດ
22/9/2016



ຖາວອນ ຊຸດິມສິນ

Appendix 10: Terms of Reference – Visiting Schedule

Terms of Reference				
Individual Short Term Visit to Luang Prabang Teacher Training College in Lao PDR				
5. Visit Schedule				
The short term visit is scheduled from Sep. 26 th to 30 th . In order to make full preparation, the research student will arrive on Sep. 22 nd and leave on Oct. 2 nd . She has no companion with her during her visit to Lao PDR.				
Date	Morning	Afternoon	Participants	Remarks
Sep. 22nd Thur.	-	Arrive at Vientiane at 21:45	-	Jin Air LJ 051
Sep. 23rd Fri.	Visiting MOES for receiving permission to visit LPB TTC		-	
Sep. 24th Sat.	City tour		-	
Sep. 25th Sun.	Departure for Luang Prabang at 9:01 City tour		-	Lao Air QV101
Sep. 26th Mon.	Greeting with president and teachers; School and classrooms tour	School ICT facilities and equipment general check-up	Teachers or school staffs 1-2	
Objective	To get familiar with school environment	To keep record of ICT infrastructure and understand to whole background of ICT integration in LPB TTC		
Sep. 27th Tue.	Course audition of different subjects (Ex. English, Mathematics, Computer, etc.; following arrangement of school staffs)		Classrooms 2-4	
Objective	To keep simple classroom record of how teachers teach and students learn in LPB TTC			
Sep. 28th-29th Wed -Thurs	Interview with Teacher Educators		Teachers 6-10	
Objective	To understand how they <u>use ICT skills in daily life</u> and in <u>educational activities</u> in LPB TTC; how they use ICT to <u>share and produce information and knowledge</u> ; how they <u>improve their ICT skills</u> and use ICT to enhance their teaching competency (30 min/teacher)			
Sep. 30th Fri.	Self-grouped interview with students (those in their last year are preferred) to know how they use ICT to help them learn and how will they use ICT to teach if they become teachers in the future (2-4 students, 30 min/group)		Students 6-12	
Oct. 1st Sat.	Rapping up and city tour		-	
Oct. 2nd Sun.	Back to Vientiane (QV 102) Back to Seoul (22:45)		-	Jin Air QV102

Appendix 11: Acronyms and Abbreviation

AUF	Agence Universitaire de la Francophonie
DRS	Database and Reporting System
DTE	Department of Teacher Education of MoES
ESDF	Education Sector Development Framework 2008-2020
HIPV	Higher Institute of Pedagogy of Vientiane (1975-1988)
ICT	Information and Communication Technology
ITU	International Telecommunication Union
JICA	Japan International Cooperation Agency
LSB	Lao Statistics Bureau
MoES	Ministry of Education and Sports
MCTPC	Ministry of Communication, Transport, Post and Construction
NEFA	National EFA Action Plan (2003-2015)
NESRS	National Education System Reform Strategy 2006-2015
NGO	Non-Government Organization
NHDR	National Human Development Report
NUOL	National University of Laos
NSEDP	Sixth National Social Economic Development Plan 2006-2010 7 th (2011-2015); 8 th (2016-2020)
PMIS	Personal Management Information System
PT	Pre-service Teacher
SEAMEO	Southeast Asian Ministers of Education Organization -
RECSAM	Regional Centre for Education in Science and Mathematics
SU	Souphanouvong University
TEMIS	Teacher Education Management Information System
TE	Teacher Educator
TTC	Teacher Training College
TTI	Teacher Training Institute
UPI	University Pedagogical Institute (1988-1996)
UNDP	United Nations Development Program

국문초록

교사교육과 ICT 통합

-라오스 교원양성기관 사례를 중심으로-

유익곤

글로벌교육협력전공

사범대학 대학원

서울대학교

세계적으로 교육과 정보통신기술(ICT)의 결합이 큰 주목을 받고 있다. 그러나, 현재까지 라오스의 교사교육에 관한 연구는 물론, 교사교육과 ICT 통합에 대한 연구 또한 미비하다. 본 연구는 이러한 상황에 주목하여 UNESCO가 개발한 ‘4 단계’ 연속체 모형과 SEAMEO 발견한 ‘10 차원’을 분석틀로 설정하고 라오스 교사양성기관의 ICT 통합 상황에 대하여 포괄적으로 진술하고 고찰하였다.

연구방법으로는 질적연구방법을 활용하였으며, 연구대상지로는 라오스 루앙프라방 사범대가 교원양성기관을 사례로 선정하였다. 보다 구체적으로는 예비교사(PTs)와 교사 훈련가들(TEs)의 ICT에 관한 경험이 연구의 주요 데이터 수집대상으로 선정되었다. 단기 현지조사와 문헌분석을 토대로 라오스 교원양성기관의 ICT 통합 상황을 분석한 결과 현재 라오스는 ‘시작(emerging)’단계 또는 ‘적용(applying)’단계에 있으나 몇 가지의 사례를 통해 ‘투입(infusing)’단계로 이행하는 잠재력이 확인되었다. 여기에는 ICT를 활용한 PTs와 TEs의 자발적인 문제해결, 학습 자료를 만들기, 지식 공유와 정책 차용을 더 쉽게 실현할 수 있는 온라인 공동체 키우기 등이 해당한다.

또한, 분석틀을 활용한 분석 결과 라오스의 교사교육과 ICT 통합에 관해 다섯가지 단계를 도출하였다. (1)주요 정책, 실천 및 인터넷 서비스 상황이 포함되는 국가차원; (2)학교 문화, 인프라 시설, 교육과정 그리고 ICT에 관한 모든 학습 활동이 포함되는 학교 차원; (3)현지 중등학교와 컴퓨터 센터 등에서 받는 ICT 훈련 경험, 민관협력사업 및 교사 온라인 공동체 등이 포함되는 지역 사회 차원; (4) ICT 제품 사용/배움 첫 경험과 용도나 목적에 관한 개인 차원; (5) 교사교육의 ICT 통합에 관한 글로벌 협력 실천.

연구를 통하여 라오스 교사교육 이해관계자들은 (1) 컴퓨터, 휴대폰 등 개인 소지할 수 있는 ICT 제품; (2) 인터넷, 서버, 프로젝션 장비, 컴퓨터 교실등 포함한 ICT 인프라; (3) 다목적 ICT 능력 및 기술; (4) 일상습관이나 취미 등을 ICT 로 인식하였다.

그러나, 라오스 사범대에서 전반적인 ICT 통합이 시작된지 2 년에 불과하기 때문에 장기적인 영향과 학습결과를 확인할 수 없었다. 또한 디지털 격차와 빈부격차로 인하여 ICT 활용 교육보다는 전통적인 교사훈련이 더 좋다고 생각하는 사람들도 있는 바, 본 연구를 통해 ICT를 활용한 교육과 학습 활동의 효과성 및 상관성을 설명할 수 없었다. 따라서, ICT 를 활용한 라오스 교사교육에 관한 연구는 앞으로도 지속적으로 이루어져야 할 것이다.

주요어: ICT 통합, 교사교육, 교원양성기관, 라오스

학번: 2014-25202