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## 論文内容の要旨

氏 名	(Marife Carpio )
論文題名	Information and Communication Technology (ICT) Usage in Non-formal Education in the Philippines (フィリピン生涯学習分野における情報通信技術 (ICT)の利用と展望)
<p data-bbox="135 607 343 640">論文内容の要旨</p> <p data-bbox="135 678 1436 909">The potential of using technology such as the use of computers and the Internet is seen to be unlimited. In the field of education, the use and application of information and communication technologies (ICTs) is now being considered as a strategy to reach more people and make learning environments more interesting and accessible. It's been established in previous researches that there are benefits for students and teachers being exposed to computers and the Internet. In recent times, ICTs are recognized as tools that can effect social change, strengthen human intellectual capacity and facilitate the development of modern lifestyles (UNESCO, 2005).</p> <p data-bbox="135 913 1436 1317">The rising importance of information and communication technology (ICT) in education urges societies and institutions to review, analyze, enhance and modify pedagogical methods, as well as consider the potentials of ICT in the context of globalization. While most programs are geared towards its use in formal education settings, it has now also permeated the non-formal education (NFE) sector. In the Philippines, the government has reverted to NFE to remedy the problems and shortcomings of the formal education sector. Thus, much attention has been given to NFE as it plays a vital role in reaching out to out-of-school children and adults, specifically in facilitating the provision of education. NFE has become an essential aspect of basic education programs, often implemented through a public-private partnership approach with its own budget and portfolio of activities. ICT, the Internet in particular, in NFE can open new possibilities and opportunities for the underprivileged to improve the quality of life. Although many developing countries have yet to experience the benefits of ICT, there is a strong belief that these technologies can be tapped to promote NFE programs and activities.</p> <p data-bbox="135 1321 1436 1485">This study was devised to develop a general understanding of the main issues in the use of ICT in NFE in the Philippines. Specifically, the study aimed to compile a detailed description of the progress made in using ICT for NFE, identify the challenges in using ICT in NFE, and determine the implications of possible implementation of TVWS in community learning centers (CLCs) where most NFE programs are being implemented.</p> <p data-bbox="135 1489 1436 1653">This study made use of qualitative methodologies to explore the subject matter. The data collection procedures involved 1) fieldwork, during which interviews, meetings and discussions with stakeholders and beneficiaries were held; 2) document analysis; 3) case study involving two community learning centers implementing the use of ICT for literacy and graduation equivalency; and 4) focus group discussions for validating and eliciting recommendations from the research participants.</p> <p data-bbox="135 1657 1436 1888">Further, this study was designed to help understand the situation with regard to the integration of ICT in non-formal education. The discussions present priorities and realistic options that the government and its partner agencies might consider in implementing future programs, as well as modifying existing programs. The results of this study will contribute to the body of information regarding efforts in improving education that the government, non-government organizations, foundations, schools and communities are carrying out. The information consolidated and analyzed in this paper can be helpful in ICT in NFE projects with regard to planning, management, infrastructure, teaching, and learning.</p> <p data-bbox="135 1892 1436 1984">This discussion is presented in eight chapters. Chapter 1 presents the premises, which led to the formulation of the study problem. It details the purpose and significance of the study as well as defines key terminologies used in the discussion. Chapter 2 is a review of related literature. Studies on ICT in education,</p>	

ICT in non-formal education, ICT for development, community learning centers, among others are presented in this chapter to facilitate understanding of the field especially in terms of understanding the impact of ICT in education and development. Chapters 3, 4 and 5 describe the evolution of NFE in the Philippines and how ICT has come into use in NFE. These chapters discuss how the Philippines has resorted to NFE to resolve some problems in the formal education sector, and which policies have been put into place to make the integration possible. Some examples of programs being implemented, and the challenges that the stakeholders have encountered are included in the discussion. Chapter 6 discusses observations done in two community learning centers. The centers make use of ICT along with a blended and collaborative mode of instruction, to provide basic education to out-of-school youths and adults. These cases showed the key issues and concerns for a successful implementation of ICT-based learning in non-formal education, particularly in community learning centers. Chapter 7 shows the possible implications and future directions in ICT in NFE programs with the use of TVWS for rural connectivity. One of the critical factors in assuring the success of ICT use in NFE is the availability of connectivity. Getting connected means being able to have access to information and being able to communicate and network with experts, as well as people with common problems or difficulties. This chapter presents the achievements of pilots and trials on the use of TVWS technology. Chapter 8 presents the summary of findings and the conclusions of the study, based on the observations and literature review. Recommendations for future activities are also presented.

## Results

The Bureau of Alternative Learning System (BALS) of the Department of Education (DepEd) has been mandated “to protect and promote the right of all citizens to quality basic education and to promote the right of all citizens to quality basic education and such education accessible to all by providing all Filipino children in the elementary level and free education in the high school level. Such education shall also include an alternative learning system for out-of school youths and adult learners (Executive Order No. 356).” In partnership with the Department of Science and Technology (DOST) as well as other government and non-government agencies, the DepEd BALS has been promoting and implementing community-based programs to address the problems in literacy. Parallel to this is the goal of reducing the digital divide by providing interested learners with basic skills and ICT-literacy to be able to compete globally.

In recent years, the Philippine government has become active and decisive in pursuing the goal of ensuring basic education for all (EFA), integrating ICT in non-formal education, and to remedy the concerns of the digital divide. Public-private partnerships have been forged to offset funding problems and share resources in laying out sustainable strategies for further development of ICTs, and for implementing ICT programs and achieving the desired impact and outcomes.

The prime objective of any ICT-enabled NFE program may be (1) for fostering adult/child education, (2) for creating community awareness, or (3) for community empowerment/development (UN, 2010). These were observed in the programs that were developed and implemented by the Philippine government and its partner agencies. The applications of ICT in NFE in the Philippines are for 1) basic education, 2) ICT skills training, and 3) providing access to information and knowledge for community empowerment. Programs are being implemented in several learning spaces: community learning centers (also referred to as e-centers or techno hubs), mobile classrooms, libraries, websites, television and radio.

One of the major projects under the Alternative Learning System is the use of community learning centers as hubs for learning with ICT. The project has been dubbed eSkwela, a word play on the combination of “e” for electronic, an Internet-related prefix used in terminologies such as e-learning, e-mail, e-commerce, e-business, etc., and the local term for school “iskwela”. In the observations done in two learning centers, it was found that learners perceived the use of computers as an agent of change. Their perceptions were a clear indication that ICT in NFE initiatives should always focus on the needs of the learner. In this way, the learner can have flexibility in customizing learning depending on what is appropriate for his or her needs. While the use of ICT may lead to a level of democratizing learning and has the capacity to motivate adult learners, there is still a need for personal interactions to provide a balance with traditional instruction, which the learners have previously been immersed. Implementers should take note, however, that the technology is continuously changing, often with sudden surges in innovation and progress. These changes may overwhelm

learners and might deter them from their learning objectives. There may be a need for performance evaluation mechanisms for facilitators, to provide them with additional training on fusing traditional methods of teaching and ICT-based instructional design. Development of modules in local languages/dialects may also be needed. Based on the observations in these two learning centers, challenges in integrating the use of ICT in NFE programs include availability and speed of connection, unstable electric power supply, maintenance of hardware and software, and funding source for continuing operations (sustainability).

The use of TVWS to provide connection in rural areas may help in providing greater access to ICT in NFE programs. The Philippines' experience in the use of TVWS technology is in the areas of agriculture, disaster response, health care and education. The initial pilot project in Bohol was implemented with the purpose of registering fisher folks. On the wake of the strong earthquake in 2013, the project's purpose was redirected to provide Internet connectivity to help earthquake-hit municipalities. The TVWS technology's role in disaster response was again tested after one of the strongest typhoons in the world hit municipalities in Leyte. The successes in these implementations inspired the use of TVWS in providing connection to an e-Health solution dubbed RxBox Project. With regard to education, schools that are within the range of the areas set-up with TVWS can now access information in the Internet. Plans for the use of the technology in the education sector is currently in its initial stages, with the municipality of Pulilan in Luzon as the beneficiary. While it is still in its pilot stage, the opportunities which the TVWS can offer in the education sector is really unique but not without challenges. The Internet is a very democratic platform to learn about many things, however, information gathered from the Internet must be carefully examined for validity, credibility and appropriateness of use. People who will be using this information must develop digital literacy skills. Mere access to the Internet is not enough to facilitate effective education. People must be able to critically think about the information that they acquire from the Internet. The use of TVWS is not only about making information available to people. It also is important to know how to process this information and be able to use this to achieve cognitive, social and economic goals. The potential of TVWS to provide cost-effective coverage has encouraged its utilization in countries that would like to bridge gaps of connectivity and learning. Transmission of knowledge is just one aspect that the TV White Space can provide but there is still a concern on how to ensure that quality learning takes place in every individual, and how this will affect the over-all goal of achieving multiple learning objectives.

Project implementers should note that the focus should not be on technology, but rather how it is used. Policymakers should not be under the assumption that technology should drive education. It would be more appropriate to think that educational goals and needs, and careful economics, should drive technology use. This is one way that educational institutions in developing countries can effectively address the needs of the population. This way can provide the population with skills and abilities to rise up to new challenges and opportunities put forward by a global economy.

ICTs alone cannot address the problems in education in the developing world. There are underlying issues and factors that may be affected by poverty, social inequality, and uneven development. ICTs can only aid developing countries by expanding access to and raising the quality of education. The lessons from the two observed centers should guide policymakers and project implementers to carefully consider policy and politics, infrastructure development, human capacity building, language and content, culture, equity, cost, and the theory and practice of adult education.

Although significant developments have been observed, there is still a need to address connectivity problems, lack of funding, coordination and systematic planning amongst the various implementing agencies. A number of other challenges need to be addressed and opportunities leveraged to ensure that the gains greatly contribute to the good of all citizens. The main challenge is to ensure that the projects and programs that are being implemented have a meaningful impact on the daily lives of people. Careful planning, community involvement, creating relevant and localized content, consolidation of efforts from the various sectors, development of human capacities, and technology upgrading are needed for the success of any ICT in NFE projects.

## 論文審査の結果の要旨及び担当者

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## 論文審査の結果の要旨

本論文では、フィリピンの教育分野における情報通信技術(ICT)の活用動向と課題について、ノンフォーマル教育(NFE)を軸にまとめており、特に都市部と過疎地の課題や、被災時等を契機としてフィリピンがその活用で先行するTVホワイトスペース(TVWS:テレビ放送デジタル化等により空きチャンネルとなり、2008年より利用が始まった地域の未使用周波数領域)を用いた地域無線教育情報インターネット網の構築過程を詳細に調査・分析して、その意義や効果・課題を検証、将来に向けた提言を行っている。

論文の第1章は研究の背景や目的、第2章は教育分野において情報通信技術の果たす意義と役割をユネスコAPEID(Asia-Pacific Programme of Educational Innovation for Development)等の文献で遡ると共に、デジタルデバイド解消のため今世紀初頭、欧米で展開された地域学習センターや図書館の情報化プロジェクト等の動向を追跡している。さらに、APEC教育基金を活用、2006年にフィリピンCICT(Commission on Information and Communications Technology)と教育省が構築を開始した、生涯学習環境の情報化を図る eSkwelaプロジェクトを紹介している。eSkwelaは、地域のセンターに設置されたネット接続PCによるeラーニングと巡回講師によるブレンド型学習により、生活スキルの獲得からデジタルリテラシー等新技能の開発、さらに卒業認定試験対策等まで各自の進捗で受講可能な教育システムであり、その経緯を詳しく述べている。第3章ではフィリピンにおける学校教育の歴史や、1977年に次官室が設置されたNFEの推移をまとめ、貧困等で就学機会を失った関係者に基礎能力を提供する役割を担ってきたこと等を述べている。第4章はフィリピンを取巻くICTの現状を記しており、公立小学校の85.8%(2014年)でインターネットが使えないなど、課題の大きいことを示している。第5章では、フィリピンのNFEにおけるICTの役割や機材構成、政策決定者の意図等を広範囲に集約・分析している。例えば、インターネットが利用できるコミュニティe-センター(CeC)が国内各地に設置されたのは、ユニバーサルアクセスを保証するためであったが、ICT環境は新たな教育システムの一部になりつつあることを確認している。第6章では、都市部と過疎地のコミュニティラーニングセンター(CLC)の成立過程やeSkwelaプロジェクト受講者を対象にアンケートやインタビュー調査を行い、eラーニングは自尊心が高まるものの、教員との交流が少ないため、学習支援者が創造力を発揮し努力する必要があることを示している。さらに第7章では、マグニチュード7.2の地震に遭遇したボホール島の半径20kmの3個所の地域内(各々25~30校の学校を接続)や台風「海燕」(2013年)に遭遇したレイテ島の3校、ルソン島プリラン地域の小学校13校と高校3校および市公会堂、の各々について、TVWSを用いた無線インターネット網で接続した事例を調査し、教育情報網としての有効性を確認している。特にレイテ島の事例では、一か所の衛星接続で広域のインターネット網が利用可能となったことをインタビューで確認しており、被災時等の通信途絶対応策としても期待が大きい。第8章では、まとめと提言を行っている。

NFEやTVWSの有効性や課題を解明するには、更なる研究の積み重ねが必要と思われるが、本論文はその可能性を十分に論じていると評価できる。

以上により、本論文は博士(人間科学)の学位授与にふさわしいと判定した。