

学位論文の要旨 (論文の内容の要旨)
Summary of the Dissertation (Summary of Dissertation Contents)

論 文 題 目
Dissertation title:

Recontextualizing Teacher ICT Capability in Geographically Isolated and Disadvantaged Areas at the Time of COVID-19

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This research examined the ICT capability of teachers teaching in geographically isolated and disadvantaged areas (GIDA) in the Philippines, and how their teacher ICT capability transformed to ensure that learning would continue amid COVID-19. It also attempted to draw out a new concept of teacher ICT capability that describes the kind of capability a teacher must have to minimize the effects of school disruptions on the quality of education in GIDA at the time of national or international crises like the current COVID-19 crisis. Specifically, it answered the following questions: 1) what teacher ICT capability do teachers in geographically isolated and disadvantaged areas in the Philippines have before COVID-19?; 2) how has the ICT capability of teachers in geographically isolated and disadvantaged areas transformed during COVID-19?; and 3) based on the results of the study, what new form of ICT capability was formed and how this capability was recontextualized for geographically isolated and disadvantaged areas?

The study used a mixed-methods embedded research design. The focus was on the teachers' use of ICT in GIDA in selected schools located in three major regions of the Philippines – Luzon, Visayas, and Mindanao. Nine (9) schools were selected - three in Luzon, three in Visayas, and three in Mindanao. The schools were selected based on the following: schools are located in remote, rural villages; technology (traditional and digital) integration is evident in the delivery of instruction; and with science teachers teaching in Junior High School. Science teaching was chosen for the study because it is found as a content area where technological tools can be optimized to facilitate understanding of science concepts and their application.

As an embedded mixed methods research design, the quantitative data collected were supported with qualitative data gathered before and during COVID-19. Before COVID-19, data were generated between the months of November 2018 and February 2020 through interviews, document reviews, classroom observation, questionnaires, and focus group discussions. Interviews and quarterly scores were the sources of data during COVID-19. The months of November-December 2020 and April-August 2021 covered the data gathering activities. Descriptive statistics, specifically frequency, percentage and weighted mean were utilized to analyze the quantitative data which consisted of responses in the questionnaires, student perception survey and classroom observation guide. For the pre-post tests and quarterly grades of the students, t-test was used, and frequency/percentages. Qualitative data composed of participant's responses to the open-ended questions in the questionnaire and the interview were analyzed with the use of codes and thematic analysis of field notes. For data validity, triangulation of data using teachers' responses from questionnaires, interviews, the result of document reviews and pre-post test scores and quarterly grades were done.

Based on the results, this study found answers to the research questions, as follows:

1) The teachers even before COVID-19 have high ICT utilization and high competency in using ICT in designing and delivering their lessons. Their high ICT capability can be attributed to the sustained implementation of professional development programs for teachers. The regular, even weekly conduct of training programs, that included topics on ICT, equipped them with the knowledge and skills needed to design and implement ICT-mediated instruction.

2) The transformation of their ICT capability is ushered in by their rich technological and pedagogical knowledge in using ICT, the challenging experiences that they had encountered even before the pandemic, their mindset to help students cope with the difficult situation and the strong support from the national and local government, school administrators, and peers. The adjustments they made to cope with the challenges of remote teaching during COVID-19, is viewed by this study to have recontextualized their teacher ICT capability.

3) The new concept emanated from the ICT capability of GIDA teachers before COVID-19, the transformation in their ICT capability and the factors that propelled the change at the time of COVID-19. The recontextualized framework describes the teacher ICT capability in the context of geographically isolated and disadvantaged areas during COVID-19. It recontextualized the TPACK model with three of the knowledge components forming the inner core of the new concept of teacher ICT capability, namely technological knowledge, pedagogical knowledge, and technological-pedagogical knowledge. It also included the factors within and outside the classrooms that are found to be influencing the updating and upgrading of the teachers' ICT capability. It likewise added the concept of *kaizen* as the force that drives the recontextualized framework to be consistently attuned to the changing learning environment.

The recontextualized teacher ICT capability developed in the study has four components: cognitive dimension; affective dimension; *kaizen*; and contextual factors. The cognitive dimension consists of the basic knowledge and skills that teachers must have to effectively teach their lessons in today's digital learning environment. The affective dimension is the additional layer that would enable the cognitive dimension to function at the time of COVID-19. It has the 3 supplementary skills identified in this study as Resilience, Empathy and *Uido*. This is to factor in challenging situations present in GIDA at the time of pandemic and other related international and national crises. The recontextualized capability also recognized the efforts of the teachers to cope with the challenges of the remote set-up. These efforts are seen by this study to have contributed greatly to the learning continuity of students and the formation of a new concept of teacher ICT capability. And based on these findings, the philosophy of *kaizen* was found to be the force that propels the continuous updating and upgrading of this new teacher capability. *Kaizen* is reinforced through continuing professional development of teachers, exploring existing and emerging technologies that influence instruction, and modification of strategies to make learning more relevant and accessible to the learners. The factors outside the classroom are likewise identified: local government support, policies, organizational support, ICT infrastructure and resources; and support among teachers.

This research concludes that the high ICT utilization and high competency of teachers in designing and delivering ICT-mediated lessons can be attributed to the teachers' positive attitude towards technological innovations and recognition of ICT to facilitate learning. Having high ICT capability benefits not only the teachers but also the students. Use of appropriate ICT tools could help facilitate understanding of complex and abstract concepts such as in Science. Teachers, whether teaching in GIDA or non-GIDA, amid pandemic or without, possess the technological and pedagogical knowledge that is fundamental to effect meaningful and skilled use of ICT in teaching. Yet, this has to be constantly updated and upgraded to make teaching and learning attuned to the continuously changing learning environment. Limited technological devices and unstable internet and power supply made their use of ICT tools more challenging. Based on the results of this study, these difficulties made them more resilient in ensuring that learning continues by optimizing the limited use of technologies. Their high competence and positive attitude towards the use of ICT enabled them to be flexible in the design of their ICT-mediated instruction despite the limitations. The transformation of their ICT capability to a more "intense", "widened" ability to perform their teaching tasks is facilitated by their affective skills, positive attitude towards using technology, and positive support from relevant institutions.

GIDA and non-GIDA teachers may both have been experiencing the difficulties COVID-19 bring. But

GIDA teachers face the most challenges due to that another layer of difficulty that they have to face everyday. Their access to technological devices and stable supply of power and internet access, and even ICT-related training is always challenged, where in non-GIDA areas these difficulties could easily be addressed. This study found that the driving force is much stronger in GIDA than non-GIDA areas. Efforts must then be consistently instituted to upgrade and enhance the cognitive and affective dimensions and positive influence of the contextual factors outside the classrooms must further be encouraged. The recontextualized teacher ICT capability is found to be the new teacher ICT capability that will work in GIDA communities. This study recommends that the recontextualized teacher ICT capability be used for refugees education, and in other Asian and African countries whose education systems are likewise challenged by technological, socio-economic, health, environmental and armed conflicts issues. A research applying the framework to instructors of tertiary education could also provide different context in using ICT to expand human capabilities at the time of national or global crisis. Future research could include fieldwork to pilot-test and document the relationship between the new academic capability and quality of education.

備考 論文の要旨はA 4判用紙を使用し、4,000字以内とする。ただし、英文の場合は1,500語以内とする。

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