EXAMINING THE PROFICIENCY OF TEACHERS IN USING ICT AND ITS INTEGRATION IN THE TEACHING-LEARNING PROCESS: BASIS FOR DEVELOPING FRAMEWORK

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Abstract: *This study investigated teachers' computer literacy and extent of technology usage in teaching. To gather as comprehensive an overview as possible, the research employed a mixed-methods design incorporating both quantitative measures and in-depth information to allow for an appropriately balanced investigation. The research was carried out adapted deep evaluation methods. The research took place in the first Congressional District of Pangasinan, and involved 23 primary schools with a total of 100 teachers as respondents. Questionnaires were distributed to Pangasinan's 1st Congressional District public schools and a sit-down interview followed. Statistical analysis of quantitative data, such as frequency counts and percentages, averages (mean), the dispersion of the data (standard deviation), and the correlation between variables (Pearson correlation coefficient), was involved in the research approach. This research also found that teachers often integrate I.C.T. in their teaching and procedures. In addition, this research identified a high demand for ICT-related employment among teachers, making it necessary to obtain their own I.C.T. resources for teaching. Teachers are hopeful of using I.C.T. in classrooms and as a vital part of their pedagogical tools. When they were asked about the hindrances to integrating I.C.T. in non-computer classrooms, all respondents cited a shortage of a computer, projector, and Internet facility, insufficient time to prepare I.C.T. materials, and lack of adequate I.C.T. training for teachers.*

Keywords: Teacher Proficiency, I.C.T. Integration, Mixed Methods, Pangasinan, Philippines

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INTRODUCTION

Bringing information and communication technology (I.C.T.) to education revolutionized teaching and learning globally, impacting students' modes of learning and teachers' ways of teaching. The worldwide transformation towards I.C.T. integration signals the fundamental transformation of teaching and learning practices and global societal effects of technology adoption. UNESCO has discovered that teachers in Asia vary in I.C.T. proficiency. This indicates that technology-enabled learning is not equal and teachers require additional training. Integration of challenges in European schools highlight the need for sophisticated tools, connectivity to the internet, and ICT integration at the primary level of education (Korte & Hüsing, 2006). The Americas reinforces the significance of instructors' competency in the use of ICT and indicates that, teachers need technical competencies as well as communication competencies across a variety of pedagogy types (Daniels, 2002; Rampersad, 2011). I.C.T. is considered a key to the development of societies in Africa because it allows someone to acquire, capture and distribute information in a different manner (Association of African Universities, 2000; Galbreath, 2000). Oceania considers the integration of ICT in schools brings out the challenges teachers face, including limited resources, limited time, and the need for recognizing the need for continued professional development (Du Plessis & Paul, 2012; Mumtaz, 2000). Perhaps the greatest issue with implementing ICT in schools is that there isn't sufficient technical support or training for teachers. Rogers (2000) says that lack of availability of technical resources and failure to provide staff with proper training are usual issues that make it difficult to apply new technologies in educational settings. Studies across several continents prove that teachers are central to the successful embedding of new technologies in educational environments. Continuous training, school-level support, and meshing technology with instruction are all beneficial (Barker, 2002; Roberts, 2003).

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The United Nations Educational, Scientific, and Cultural Organization's Global Education Monitoring Report (UNESCO, 2020) indicates that ICT is not being utilized more in developed and developing nations. The paper considers issues and opportunities in transforming school operations to address the evolving needs of the world. Pilots undertaken in Jordan and Southeast Asia illustrate that teachers have different levels of ICT skills, which lead to a discussion on the implementation of technology to improve learning for students and the reluctance by education institutions to embrace such actions (Rashid, 2014; Shazali & Hashim, 2018). Murata et al. (2013), asserted that honoring tradition and beliefs has the ability to enhance emotional experience and enhance everyday life. Tradition and belief provide emotional support that can lead to stability, meaning, and comfort - ultimately waxes or wanes one's psychological well-being and quality of life. This situational overview on ICT integration into education reflects current research trends and the thoughts of prominent stakeholders. This review looks at literature across countries to understand, the applicability and impact of ICT in education. The research identifies distinguished researchers, such as Jo Tondeur, J. Ertmer, S. Ghavifekr, and W.A.W. Ros Dy, for their paramount contribution to the adoption of ICT in education. Important work that is commonly referred to has been made by Vrije Universiteit Brussels and Ghent University. The most frequently mentioned and published countries for their applications of ICT in education are the United States, Belgium, Australia, China, Spain, Malaysia, and Turkey. The research analyzes the influence of papers from different journals and finds Springer's Education and Information Technology and Elsevier's Computers and Education to be the most prominent publications with maximum references. These publications serve to spread the word regarding research in educational technology. Global use of ICT in education is described by the research through research topics, authors, institutions, and nations. The article emphasizes the need to continue research, collaborate, and share information in making it feasible to apply I.C.T. in learning and teaching. Assessing teachers' ICT proficiency and its integration into the teaching-learning process is one of the vital areas of research in ASEAN. This study explores the convergence of education and technology among ASEAN countries with different educational systems. It is essential for teachers to be knowledgeable of ICT tools to promote digital literacy, which is a significant part of education. ASEAN literature identifies the opportunities and issues that ICT presents to education. Literature articulates the necessity of preparing teachers with the skills and knowledge of when to use technology to help improve student learning. This research contributes to the curriculum of ASEAN member states by examining the ICT competencies of teachers and providing recommendations for an ICT integration plan. The research is consistent with its aim of enhancing innovation and the quality of education. Research into the integration of I.C.T. in education in the ASEAN countries, including Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam, is supported by relevant literature. Systematic review of I.C.T. integration in secondary schools for 2023 reviews 51 studies to understand the integration of ICT tools into pedagogy and learning. "The 2023 book "The Integration of Technology in Education and its Impact on Learning and Teaching" discusses how technology integration influences learning and teaching.". The Integration of Technology in Education and its Effects on Learning and Teaching (2023) discusses how technology integration influences education, with emphasis on how it influences learning and teaching processes. Assessing the Impact of Integration of New Technologies on Learning Outcomes of Students analyzes the influence of new technologies, such as artificial intelligence, social media, and online learning, on learning outcomes among students, determining the challenges and opportunities related to the integration of technology in education (Published in 2023). Exploring the Role of I.C.T. in Enhancing the Quality of Education in Brunei Darussalam is an insight into how I.C.T. is used to enhance the quality of education and the outcomes of education in Brunei Darussalam (Published in 2023). Educational Technology Integration

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in Cambodia: Challenges and Opportunities examines the challenges and opportunities connected with schools in Cambodia integrating I.C.T. into the teaching and learning process (Published in 2023). The Evolution of I.C.T. Integration in Vietnam examines the evolution of integrating I.C.T. into Vietnam and predicts its continuing development as well as the challenges of integrating I.C.T. into schools (Published in 2023). Establishing Digital Literacy through I.C.T. Integration in Laos examines how technology is being incorporated in schools in Laos to assist students in becoming more digitally literate (published in 2023). I.C.T. Policies and Implementation Strategies in Education in Myanmar examines the I.C.T. policies and implementation strategies in Myanmar, yielding reflective insights into the success and problems of incorporating technology into the education system. Combined, these studies offer a comprehensive picture of the problems, possibilities, and impacts of utilizing I.C.T. within ASEAN nations' schools. They also indicate the gap that this research study is attempting to bridge, that of the non-comprehensive studies on the overall assessment of I.C.T. usage in schools in ASEAN nations (2016). The N.O.C. believes Iloilo would be an ideal location for ASEAN meetings in the Philippines. MENA Report, not available. Developing Digital Literacy Through Integration of I.C.T. in Laos examines efforts towards enhanced digital literacy through integration of I.C.T. in Laos, highlighting technology integration in education (published 2023). I.C.T. Policies and Implementation Strategies in Education in Myanmar examines Myanmar's I.C.T. policies and implementation strategies, which learn about the challenges and achievements of integrating technology into the classroom. These studies together present the complete picture of the challenges, opportunities, and effects of Information and Communication Technology (I.C.T.) integration in education among ASEAN countries, filling the gap in the literature, which this study aims to address, i.e., the absence of complete studies on the holistic assessment of I.C.T. integration in education among ASEAN countries, especially in 2016. The N.O.C. believes that Iloilo may be a suitable location for ASEAN meetings in the Philippines. MENA Report, N/A. While research on aspects of ICT integration in education across the countries mentioned above has been conducted, there is a need for more extensive study that takes into account the specific challenges, opportunities, and effects of technology integration in the diverse educational settings of the ASEAN countries. This research examines only the role of Information Communications Technology (I.C.T.) in the educational contexts in each of the ASEAN countries. It seeks to develop an understanding of the barriers to the integration of technology in education and the implications for teaching and learning, by drawing together insights from across the regional experiences. The intention of this paper is to explore the differences in the I.C.T. policies, implementation practices, barriers, and successes of each ASEAN country to provide a broad regional understanding of the integration and use of Information Communications Technology (I.C.T.) in education. The primary reason for exploring this topic is to understand the growing importance of technology within education, and the varied experiences of the ASEAN countries in adopting and implementing I.C.T. in education systems, at both higher education and basic education level. This research seeks to add to the body of knowledge regarding I.C.T. in ASEAN nations through the provision of actionable evidence to support regional policy-making, educational practice, and directions for future research. The regional scope of the research offers a context under which the challenges and opportunities faced in the integration of I.C.T. can be understood, leading to empirically informed strategies to increase educational performance and technological competencies. Existing literature has reviewed a number of approaches in which I.C.T. is included in the curriculum in these nations, but more studies are needed to determine the challenges, opportunities, and effects of technology integration in different educational settings in the ASEAN nations. The research evaluates I.C.T. integration within selected ASEAN nations' education systems. Through the confluence of findings from numerous regional contexts, this research aims to deliver an integrative, analytic

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explanation of the intricacies involved in embedding technology in learning, as well as pedagogical implications. This analysis shall describe the dissimilarities and similarities of regional I.C.T. adoption strategies and policies, compared to other nations, challenges, and success rate ratings that each ASEAN nation has faced, thus giving a full regional I.C.T. analysis in education. The justification for the topic is based on the increasing popularity of technology in education and the mixed experience of the ASEAN nations in the application of ICT in their education systems. The purpose of the study is to fill the gap in literature through providing meaningful information that will inform policy-making in the region, improve educational practice, and guide subsequent research studies. The regional focus of the study allows for differential analysis of the opportunities and challenges of the integration of ICT in schools to inform empirical strategies to enhance student performance and digital literacy in ASEAN nations. Previous studies have explored some dimensions of the integration of ICT in education in these nations; yet, there is a need for extensive research to respond to the specific challenges, opportunities and implications of technology integration in the varied education contexts of the ASEAN nations. The current research specifically focuses on the use of ICT in education in selected ASEAN countries. The research seeks to develop an informed understanding of the complexities in the use of technology in education and the effect of ICT on teaching and learning, by drawing upon examples from a variety of regional contexts. This comparative research is to differentiate the differences between the problem identification, ICT policies, implementation processes, challenges, and successes of ICT in ASEAN countries, to represent a regional perspective of ICT in education. The motivation for choosing this theme arises from the changing role of technology in education and the unique experiences of member states in the use of ICT as part of their education system. This study captures a gap in the literature by contributing to regional policy, educational practices and future research. The local emphasis of the research captures context and the implications of advantages and disadvantages of using ICT in education. This gives ASEAN countries a rationale to act based on evidence, towards improving learning outcomes and digital literacy.

FRAMEWORK

This article provides an overview of the use of I.C.T. in classrooms in Southeast Asia. The main point of the research emphasizes the important role of I.C.T. in education but relates that to issues facing I.C.T. There are difficulties using I.C.T. in Southeast Asia because of inadequate or reluctant teacher training, lack of equipment or Internet access, and cultural differences that do not always align to Western perspectives. The research utilized two theories, the Diffusion of Innovations and Technology Acceptance Model (T.A.M.), in measuring the influence of these challenges on teachers' uptake of I.C.T. The authors propose an integrative approach to solve teachers' inadequate uptake. They advise that I.C.T. tools be utilized in a manner that suits the culture, and that teacher training, school facilities, policies, and finances all be adequately at the desired levels. We have to conduct more studies to determine the optimal way to apply I.C.T. in Southeast Asian classrooms and how it will influence the long-term achievements of students. The authors refer to some of the challenges of applying I.C.T. here and propose how these might also be methods for developing technology to be more useful.

OBJECTIVES OF THE STUDY

The aim of this study is to explore the experiences of and barriers to effective ICT use in schools in Southeast Asia. This study will examine two key influences on the use of ICT, readiness of

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teachers, as well as cultural responsiveness, as two influences on ICT use. The study will explore how theoretical frameworks such as Diffusion of Innovations and Technology Acceptance Model (T.A.M.) influence the decision of teachers and school leaders to use or not use technology in the classroom. When combined, this information would shape recommendations on how to address the challenges of ICT use in schools in Southeast Asia. The study will evolve into a professional inquiry on ways to effectively integrate ICT use in the learning context of all students from Southeast Asia, with the aim to improve student achievement.

METHODOLOGY

Research Design

This research examines the problems with the proper use of ICT in education in Southeast Asia. The research examines how variables such as instructor readiness and the suitability of using ICT instruments indirectly affect their implementation. It will elucidate the use of both Diffusion of Innovations, and T.A.M. theories have on the decisions that teachers and administrators implement in classrooms towards adopting technology. The information will be used to generate guidelines on overcoming some of these challenges. The research will provide insight into successful I.C.T. integration strategies used in southeast Asian classrooms to improve student achievement.

Research Site

The study location of this research is the 1st Congressional District of Pangasinan public schools in Southeast Asia. Questionnaires were sent to these schools, and the researcher collaborated with the Schools Division Offices of Pangasinan I and Alaminos City for clearance to conduct the study. Approvals were requested to coordinate with school principals to select respondents. The researcher assisted teachers in completing the questionnaires, and upon receipt of the completed forms, the raw data were statistically analyzed to obtain study findings. Moreover, teachers were interviewed to clarify their constraints in integrating I.C.T. into teaching and learning to identify solutions for effective integration of I.C.T. into the teaching environment with the aim of enhancing learning outcomes.

Participants

The respondents of the study were 100 teachers from different schools teaching grade 1 to grade 3 during the school year 2023-2024.

Instrumentation

In collecting data pertaining to the issue, the researcher created a questionnaire with five segments. The questionnaire was formatted in the most convenient way for the respondent. The respondent ticked the ones closest to them. The first section of the questionnaire contained five sections. Part I elicited feedback on the background of the respondent, e.g., age, sex, teaching designation, number of years in the teaching profession, rating of work performance, number of times trained in I.C.T., and whether or not available at home. When the item was scored 5,4,3,2, and 1, teachers' attitudes towards I.C.T. integration reflect that they Strongly Agree, Agree, Moderately Agree, Slightly Disagree, and Strongly Disagree. The second section will determine the proficiency level of I.C.T. teachers. The options will be given on a Likert scale with similar descriptions: Advanced, Proficient, Approaching Proficient, Developing, and Beginner. The third section of the survey gauges the availability of infrastructure for I.C.T. in the 1st Congressional District of Pangasinan to facilitate technology integration. It is a checklist type which can be answered either yes or no. The last part of the test evaluates the level of I.C.T. integration by teachers in teaching and learning within the classroom. The choices will be displayed on a Likert scale with the same

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description: Always, Often, Sometimes, Seldom, and Never. Throughout the study, the researcher followed ethical considerations by putting participants' confidentiality, anonymity, and safety first. Participants' personal details were kept in strict confidence, and risks and benefits were equitably distributed among randomly selected participants. Participants were given elaborate details of the research procedures, and plagiarism was not allowed. The researcher, research advisor, and specified experts were the only people aware of the progress of the study and any arising problems. Schools and teacher-respondents were handled with care and respect in the course of the study.

Data Collection

The questionnaires were administered to the 1st Congressional District of Pangasinan public schools. The researcher elicited permits from the Schools Division Offices of Pangasinan I and Alaminos City to proceed with the research. Endorsement was obtained to increase cooperation with school principals in the selection of the respondents. The researcher assisted teachers in completing the questionnaires, and after all the copies had been retrieved, the raw data were statistically analyzed in order to obtain the study results.

RESULTS AND DISCUSSION

This study extensively discusses the use of Information and Communication Technology (I.C.T.) in grade schools in Pangasinan's 1st Congressional District, covering factors like the demographic of teachers, the computer literacy level, availability of I.C.T. facilities, and the degree of I.C.T. integration into pedagogy. The study identifies a heterogeneous demographic of teachers, most of which were aged between 31 and 40, with a strong female majority. Teachers usually work in I-III positions and possess 0-10 years of working experience, reflecting an entwined combination of youthful vigor and experience in the teaching workforce. Teachers possess computer skills such as simple I.C.T., word processing, spreadsheets, and multimedia presentation but are lacking in video editing. This indicates that the teachers are capable of utilizing I.C.T. to their online, indexed, and cross-referenced journal, where they publish students', staff, and financial/economic, technical, and institutional research findings.

The study found a broad gap between teacher readiness and availability of I.C.T. resources within schools. Computer or laptops, internet access, and smart TVs are what classrooms need as infrastructure. There is a very high gap between intentions to integrate I.C.T. and availability to make it happen. Teachers utilize I.C.T. for academic purposes like presentation, software, and Internet-enabled research. The schools themselves are generally not in a position to fully integrate I.C.T. due to the lack of infrastructure and resources available. Hurdles towards integrating I.C.T. have been recognized by teachers, such as the lack of ready availability of computers, projectors, and the Internet in classrooms, taking too long to prepare lessons, and insufficient training. All these hurdles combined hamper the integration of I.C.T. in schools. This research highlights the need for an inclusive ICT Integration Framework that supports teachers, reinforces infrastructure, and offers advanced training to enhance ICT integration within schools. A framework can assist with strategic employment of I.C.T. facilities and assist instructors in employing technology to instruct. The research recommends that school managers, policy makers, and planners must develop and implement the action required for enhancing the quality of I.C.T. utilisation in the classrooms. To improve teaching and learning, there must be investment in I.C.T. infrastructure, practical teacher training, and policy making towards ensuring its proper use for education.

In determining the competency of teachers in utilizing I.C.T. and its integration in the teaching-learning process as a foundation for framework formulation, there is a need to analyze critically the

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procedures and theories employed. Methodologically, it is paramount to rigorously analyze factors such as sufficiency of sample size and variance, effectiveness of research design in detecting subtleties of I.C.T. use, instrument validity for measuring I.C.T. skills, and appropriateness of analytical procedures for deriving useful conclusions. Theoretical models are significant to the interpretation of findings and suggest the use of pedagogical theories to explore the effect of I.C.T. competence on teaching approaches, technology integration models to assess the level of I.C.T. integration, and innovation adoption theories to establish factors driving teachers' adoption of I.C.T. tools. Identifying the limitations of the study, that is, methodological and sample biases, and proposing directions for further research, for example, comparative studies and longitudinal research, would strengthen the study and inform strategy development on how to better promote ICT integration in schools. By critically analyzing the applied methods and theories, the analysis is capable of presenting invaluable insights towards enhancing ICT integration practices in the teaching-learning process and inform the development of a holistic framework for refining educational outcomes through technology integration.

CONCLUSION

This research echoes the enthusiastic, if comparatively inexperienced, body of teachers in Pangasinan who wish to use I.C.T. in classrooms - and who have all experienced several training exercises that indicate that they are ready to implement I.C.T. in education. Yet schools need the fundamental computer base, access to the Internet, and smart T.V.s. Moreover, the proof of computer capacity along with teachers' enthusiasm for applying I.C.T. within the schools indicates the necessity of a strategic, budgetary investment in - at least - bringing each school up to I.C.T. standards. As teachers show comfort and familiarity with computers, it mirrors their degree of I.C.T. incorporation daily. Thus, familiarity and proficiency with I.C.T. are of critical importance as it pertains to effective use of educational technology and classroom integration of I.C.T. In addition, the research also established the teachers' extensive use of I.C.T. outside the classroom and their acquisition of I.C.T. devices for personal applications, showing high importance as it pertains to interest and dedication to utilizing technology devices within and outside their classroom. The findings indicate that we require a unified ICT Integration Framework which will ensure learning and teaching can go on, address the requirements of the classroom infrastructure, provide teachers with specific training, and foster ICT as a tool for learning by developing a school culture that endorses it.

TRANSLATIONAL RESEARCH

The research findings of I.C.T. integration in elementary schools in Pangasinan have far-reaching implications in transforming scientific information into understandable and instructive formats for multiple stakeholders.

Researchers can publish the key findings and recommendations of their research in new and existing academic journals. You can do this by creating policy briefs or white papers breaking down the chief issues and solutions for I.C.T. integration into smaller, more easily digestible chunks. They can be written specifically for teachers, policymakers, and other decision-makers in education to inform their decisions, develop useful policies, and provide resources. Teachers can even adopt multimedia storytelling methods, such as brief documentary clips or animated video, to indicate what they think and how they feel while they navigate the intricacies of infusing I.C.T. Such a kind of audio-visual report is able to help individuals comprehend research findings and get them to care about and feel for others, including parents, the community, and the public. Scientists can collaborate with

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local performers, musicians, and artists to create more expressive and beautiful means of educating individuals through plays, dances, and songs.

The way the results of the study are presented through art can cause students and educators to feel highly, resulting in community discussion and action. Picture books, fact sheets, and properly crafted posters are all suitable methods for disseminating what was discovered from the study. In order to inform many individuals, the same print materials can be placed in strategic locations in schools, community centers, and educational conventions. The researchers can also publicize the outcomes of the study on the radio or in podcasts. This will allow teachers, policymakers, and education experts to discuss the findings in greater detail and include their own perspectives. These aural modes of presentation have the potential to reach large groups of people and create long-term discussion around local I.C.T. integration issues and opportunities. A multi-pronged knowledge translation approach allows the authors to be confident that the beneficial findings arrived at through this I.C.T. integration research are disseminated effectively, and action is provoked and catalyzed to make a positive difference in the elementary education system of Pangasinan. Strategic use of various media forms can serve the interest of policy makers, teachers, and the public, ultimately leading to improved teaching and learning outcomes through proper information and communication technology integration. A study of Information and Communication Technology (I.C.T.) integration in primary schools in Pangasinan's 1st Congressional District investigates teacher profile, I.C.T. competence, resource availability, and integration of I.C.T. into pedagogy. The research indicates that the teaching staff is heterogeneous and that the majority of the teachers were highly competent at computer tasks, and this indicates they are prepared to utilize I.C.T. There exists a huge disparity between teachers' preparedness to utilize I.C.T. tools and the simplicity of access to basic I.C.T. tools for schools, which prevents their use. The research highlights the need for an effective ICT Integration Framework that facilitates teachers, improves infrastructure, and provides specialized training for the effective use of ICT in the education environment.

A good research methodology should possess the correct sample size, the correct representation, the correct method of data collection, and the correct method of data analysis. Theoretical models, such as pedagogical models, technology integration theories, and innovation theories of adoption, will assist with conceptualizing ICT capability and its implications on instructional approach.

Speaking of the shortcomings of the study and proposing new areas of research can make it more credible. This can also assist in creating effective policies for education and incorporating I.C.T. Methodological and theoretical analysis of the study will better ICT integration practices and inform the development of a model that will enhance learning outcomes through technology integration.

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