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Call of Duty: A Case Study of ICT Integration in Philippine Provincial Public Schools in San Isidro Davao Oriental Post K-12 Implementation

LIAN SABELLA V. CASTILLO
http://orcid.org 0000-0001-9479-753X
liansvc@gmail.com
The University of Tokyo, Japan

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ABSTRACTS

The study delves on the factors and barriers that contribute to the success and failure of ICT integration in Philippine public basic schools. The country is currently undergoing a major reform in its education system, from a K-10 system to a K-12 one encompassing an ICT module. Our case study, San Isidro, Davao Oriental is a partially rural region in the southern island of Mindanao that could be representative of a larger demographic. Exploratory mixed methods design was utilized to answer these questions. An ICT integration self-assessment matrix was constructed on the basis of previous research from UNESCO, The World Bank, OECD, among others. These standards for success were translated into a survey questionnaire distributed among the 21 schools in the municipality. Purposive sampling of schools was pooled for interview and detailed questioning, along with additional field observations. Findings show that human factors such as leadership and teacher motivation are key in realization of these goals. Faculty activity for any such venture, such as ICT integration and innovative pedagogy,

is likely limited by the basic infrastructure available within campus grounds. However, as people have the capacity to go above and beyond limitations, it is possible to transcend these limitations and progress towards innovative pedagogy and consequently the next stage in integration.

Keywords — ICT for Education, Educational Technology in Developing Countries, Mixed Methods Research, Philippines

INTRODUCTION

Globalization and Its Impact on Philippine Education

Globalization has accelerated at an alarming rate throughout the world. The digital age has promoted the continuous improvement of Information and Communications Technology (ICT) in various sectors. It is worth mentioning that developed countries and privileged socio-economic classes continue to gain knowledge and social capital, whereas the less privileged increase in numbers. Knowledge capital does play a part in this, just for the reason that prestigious academic institutions fare better in ranking methodologies, students and professionals alike are enticed by these organizations. That should not be the case we truly aim for the globalization in even a geographic sense.

World Bank's Global Knowledge Economy Theory (Spring, 2014) suggests that education is a strong factor in social mobility, poverty alleviation, and is consequently instrumental for sustainable economic growth. This theory promotes the homogeneity of education and standardization of basic curriculum on the basis of better-performing countries, most of which are of Western origin. This stream of thought however, oversimplifies education as a tool for economic development and neglects the cultural significance of application of basic civil knowledge.

On September 2015, the United Nations (UN) launched 17 Sustainable Development Goals (SDGs) as a part of a global agenda to address inequity and through measurable and inclusive means. One important goal to note is "[4] Ensure inclusive and quality education for all and improve lifelong learning" (Nino n.d.). It was previously pointed out that the precedent global goal for education only focused on the enrolment "quantity," yet lacked largely on the delivery of "quality" education. This meant that students might be attending classes without learning anything. Tests may measure learning outcomes, but ultimately honing curiosity and wonder is what it means to "improve lifelong learning."

The South East Asian region is particularly at risk of cultural imperialism due to its historic ties with Western colonialism, levels of education, economic development, among other factors. Much of its urban centers have purged cultural development in pursuit of modernization and rapid economic development to catch up with neighboring East Asian Tigers (Hong Kong, South Korea, Taiwan, and Singapore). These presuppose them to the Late Development Effect (Sanderson, 2013, 34) paving way to what we would call the utilitarianism of education. It downplays mass education as a means to obtain credentials for jobs, instead of being for the sheer pursuit of knowledge.

ASEAN Integration

From 2015, the Association of Southeast Asian Nations (ASEAN)[1] initiated a regional economic milestone. The Initiative for ASEAN Integration (IAI) or quite simply ASEAN Integration, specifically aims to narrow development gaps and disparities within its member states through uniform standards and equitable goals. Included in this program is the emergence of ASEAN network level of educational quality assurance.

To keep the Philippine education system competitive and synchronous with the rest of the ASEAN region, consequently world, the government reformed the curriculum to coincide with the changes. SEAMEO INNOTECH (INNOTECH 2012, 3) places the Philippine standing against its Southeast Asian neighbors, showing how it compares to other countries in terms of Pre-University Duration. The Philippines is clearly behind in terms of length to the point of as much as 5 years.

The ASEAN economic integration had placed pressure on the Philippines for global competitiveness. Basic education reform had been recently implemented to shift from a K-10 curriculum to a K-12 tracking program in compliance with the global standard. Albeit being seemingly behind its regional neighbors, the new policy for an extra two (2) years had not been received kindly (Geronimo, 2015).

K-12 Policy Reform in the Philippines

The K-12 Policy Reform covers all Kindergarten, Elementary Education, and Secondary Education. This shift had been coupled with mother tongue instruction as compromise for its multiple ethnic groups. New policies and curriculum seek

[1] ASEAN member nations include Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam.

to inculcate nationalism to the students, an issue (Maca & Morris, 2012) being faced particularly by the Philippines amongst its East Asian neighbors because of its deep association with its former colonizers' "the American dream." The implementation of the program timeline has begun with pioneering Grades 11-12 in the works from school years 2016-2018. Post-implementation studies have yet to be conducted as the reform is still in its early stages.

Philippine Regional Differences

The Philippines has 18 regions and a plethora of ethnolinguistic groups that speak over 100 distinct languages. There are 19 auxiliary languages (*GMA News Online* n.d.) which have been permitted by the Department of Education to be used in Mother-Tongue Based Multi-Lingual Education (MTB-MLE), which is to be utilized only until the 3rd Grade. The official languages, Filipino Tagalog and English will be introduced starting from the 4th Grade.

There is very little development being done in the provincial regions, especially those outside the Luzon area which encompass only Regions I-V, National Capital Region (NCR), and Cordillera Administrative Region (CAR). Most of the economic capacities are focused in the urban areas, hence the increasing migration of locals both locally and internationally. This is not to say that schools are insusceptible to the divide ("Datasets | Department of Education" n.d.).

Mindanao the Southernmost main island, arguably has the largest number of marginal communities, especially in the provinces where there is a common misconception that they are war-stricken. These contribute to its delayed development compared to the two other main islands, Luzon and Visayas. There is little preliminary research and progress in this area due to "political uncertainties," (Hirosato & Kitamura 2010, 307) hence it is the least developed.

There is a vision and implementation gap between the national curriculum reform and the actual situation in Philippine rural public schools. There are physical improbabilities that make it difficult to cover appropriate ICT resources, the budget constraints are dependent on school size, and they are impractically far from urban capitals. The province exceptionally fits the context of the research and satisfies the requirements that would make it adequate for a case study.

FRAMEWORK

Table 1. ICT Integration Self-Assessment Matrix (Fulton, 2000; Majumdar, 2009; Jhurree, 2005)

ICT-Pedagogy Integration Level	**Leadership** - hiring faculty w/ tech expertise - funding for tech - integration in all depts.	**Curriculum** - lesson that integrates tech - use of online resources - tech in student learning	**Infrastructure**[1] - access to tech in campus facilities - faculty dev and tech support - Internet connectivity	**Faculty** - understanding use of tech - competencies in use of tech - confidence in use of tech	**Environment**[2] - ICT accessibility - student body profile - livelihood in area	**Rating**
Emerging	Priority is focused in other areas for development, far from ICT	Primarily uses traditional single-sourced, rigid lesson plans	Very little to zero working computer units, impossible to implement fair exposure	Primed in the use of tech for administrative and instructional use	Zero to limited exposure to tech	1 - sub-par Score: 1.0-1.75
Applying	There is visible initiative towards granting of ICT enabled culture, lacking 1-2 of criteria	Utilizes tech in line with prescribed lesson plans	Some working units, for exclusive usage of classes that necessitate computer use	Uses tech for bare minimum in line with curriculum	Usage of computers limited to within school grounds	2 - bare minimum Score: 1.76-2.5
Infusing	Consistent in the direction of ICT integration, in early stages of long-term hiring/resource plans	Allows for updating and reinforcing content plans with extensive resources	Fair student: computer ratio, enabling usage outside prescribed subjects and lesson plans	Extends tech usage to accompany teaching of other subjects	Occasional exposure to advanced tech, when accessible	3 - above average Score: 2.51-3.25
Transforming	Allocates appropriate resourcing for the support of ICT assisted administration and pedagogy	Flexible curriculum that allows for autonomy for innovative methods of instruction	Excellent student: computer ratio, with a reliable ICT coordinator, and technical support and maintenance	Confident and uses tech in innovative methods, where applicable	Access and constant exposure to advanced tech outside school	4 – excellent Score: 3.26-4.0

[2] Infrastructure is defined to be school-wide resources

[3] Environment is defined to be the conduciveness for exposure to technology outside of school

OBJECTIVES OF THE STUDY

The study aimed to develop a pedagogical strategy for appropriate ICT implementation in a specialized environment, particularly in small schools based in an agrarian community in the Philippines. In addition, it sought to assess the cultural implications of introducing ICT-aided instruction in relation to student ambition and future career inclination.

In liaison with Davao Oriental San Isidro public elementary schools, this paper will attempt to resolve the general question as to how can Philippine public schools adapt and integrate ICT in light of the K-12 transition. Specifically, to: 1) Determine the success or failure of ICT integration; 2) Identify the notable differences between highly integrated schools and lower integrated schools based on these factors; and 3) Determine how ICT usage can be optimized in a rural setting, with limitations on technology literacy and infrastructure resources.

METHODOLOGY

Mixed Methods Research

Various core references rendered a model derived from the process of integrating pedagogical innovation found among teacher educators (Avidov-Ungar & Iluz, 2014). The aforementioned model is found to be specialized for teacher training and is, therefore, not directly stated to be applicable for school pedagogy and learning. However, it was nevertheless expressed even in the original study that it is not unlikely that this model might be true for ICT integration process in K-12 schools.

In large part, the methodology for evaluating the levels of ICT integration among teacher educators greatly influenced the procedures used in the current study. To elaborate, a sequential embedded and explanatory design (Creswell and Clark 2006, 143) was applied, therefore separate quantitative data was to be initially analyzed. Quantitative analysis results were then used for the succeeding qualitative phase. Extreme case groups were selected for comparison through in-depth interviews for qualitative explanation. Field observations were done in passing through field notes and personal appearance to provide a third-party researcher point of view. As the area has sporadic Internet availability and simply does not endorse the practice of email exchange, extra time was considered in the personal handing out of printed paper questionnaires. Survey distribution and retrieval were done in two (2) weeks. Personal interviews were scheduled and conducted within a week thereafter.

Quantitative Survey

A survey questionnaire was designed on the basis of the constructed assessment matrix. Questions were patterned after key points and criteria laid out on the handbook for developing countries (Wagner et al. 2005) published by The World Bank InfoDev. Answers ranged from a whole integer value of 1-4, with 4 being the highest in terms of integration.

Results were then tabulated and the average scores were computed for each indicator, including total. The outstandingly low-scoring and high-scoring schools were then contacted separately for follow-up in-depth interviews. Exceptional cases were chosen because scores were not significantly disparate for the district as a whole, and should, therefore, provide allowance when discussing in-depth. The justification for this is so that we can see in greater detail the vivid dissimilarities of the manners and methods by which schools in a small geographical area deal with change. These were considered to have a good contrast in (non-statistical) factor analysis.

Qualitative Interview

Open-ended interview questions covered the same material as the survey questionnaire, but explores more on justification and non-numerical answers. The depth, width, and methods of integration were dug into further in this stage, clarifying key differences in terms of how teaching staff deal with new policies. Technically speaking, environment, curriculum, and debatably infrastructure indicators should be around equal levels for the chosen demographic. Key understanding and interpretation of the questionnaire also serve as indirect field observation. Questions sought to expound more on the demeanor, confidence, and strategies in handling similar policy implementation plans.

Field Observations

Observed nuances on the conduct of respondents from school to school provided supplementary information on the relative interpretation and seriousness of respective teachers. Manners in answering the questionnaire also translated to objectives and perceived organizational benefit. For example, some schools might be seen to cooperate more intently in hopes of obtaining sponsorship or miscellaneous subsidy. Indirect observations such as this were taken into account.

To complement internal behavioral cues, attitudes of the community were cross-referenced. Geographical location and accessibility were also recorded to examine any patterns with regards to smaller societal norms. This would include but is not limited to the price and physical strain of commuting to and from

the campus. Importance of this accompanies the Environment aspect of the study, and considers the length of travel and distance to the district center. Level of community support is duly noted despite the recluse placement in distant mountains or shores. The intended outcomes of explanatory mixed methods coupled with field observations are to be scrutinized accordingly, to determine the tipping point of gaining momentum for the next stage.

A lightly embedded and dominantly explanatory mixed methods of design allow us to justify with a gracious combination of self-assessed measures for statistical data, anecdotal words from interviews, and third-person observation from the researcher. Field observation also allowed for unanticipated and authentic sentiments from the locals, partial participant observations, and material clarifications that might not have been possible through impersonal means such as online correspondence.

RESULTS AND DISCUSSION

San Isidro Elementary Schools Survey Results

In an attempt to find which factor was most directly proportional to total average, Leadership was found to spearhead the indicators. Simple bivariate correlation statistical analysis supports a strong positive correlation between the total average and the indicators: Leadership (school-level administration) and Curriculum (higher level national administration). The remainder of the factors also have a positive correlation but not as strongly significant. Infrastructure and Faculty have a moderate positive correlation and Environment has a weak positive correlation. At least in the case in point at the provincial level, this indicates a slightly greater importance for the influence of the governing bodies as a whole.

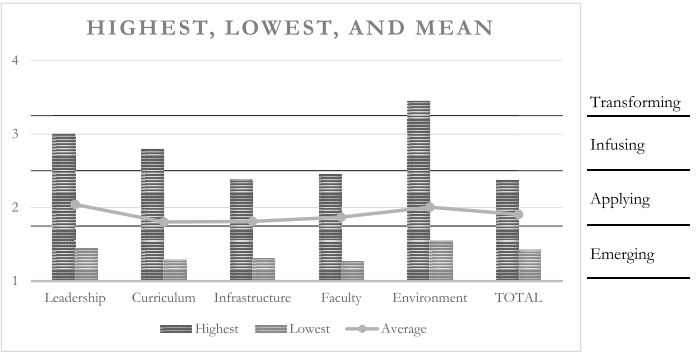

Figure 1. Highest, Lowest, and Mean of Key Indicators

Interview Analyses and Interpretation

There are important findings based on the profiling of schools. For example, H2 is a very small school in a much more far-flung district of the municipality. It does not have access to Internet connection, nor even signal for basic cellphone usage. However, it does employ much more interesting means and methods of using ICT like videos for art and physical education subjects. L2 on the other hand, is the supposed standard bearer of the district. It hosts municipality-wide activities, and is perhaps the largest school from the entire study pool. However, they are quite strict regarding their ICT usage, and seems rather prohibitive of ICT use rather than adaptive. They prefer if students and teachers refrain from using the Internet in casual times, paying close attention to social networking, games, and the like because it might distract them from work (studying and teaching). This is an expected mindset for conservative societies, but I found that depressed regions and schools such as that of H2 are much more enthused with ICT use, or any exposure at all because of its rarity, and hence their rather high self-assessment scores.

An interesting point to note here is that L1, scoring a 1.29 on Curriculum has positive comments regarding the reform, whereas H2 with a score of greater than 150% higher at 2.64 speaks the opposite. However, if we closely analyze, much of the praise is due to the cultural consideration of the new reform. For ICT, some respondents say that although they are not ready and cannot fully implement the specified national lesson plans, it has improved from the former mandate. H1 respondent shares that prior the reform, the 2004 learning competencies only required the simple know-how of the parts, no resources needed. However, this time they try hard to adhere to the new K-12 curriculum which covers the more practical usage of technology. Hence, despite not being able to reach the full bar, increasing the standards also meant enhanced efforts to carry out the new norms.

Participant and Environmental Observations

A rather unfortunate observation from public schools is that simple attendance is not taken seriously by both teachers and students. One Friday, it was observed that classes at N10 were cancelled because some of students did not come in due to heavy rain. The principal in question expressed that this is unfortunate because cancellation was not official, and it is sometimes a culture of neglect which affects the delivery of the entire curriculum altogether.

There exists a trust bond because of familial relationships between administration and stockholders. Previously, it was disclosed that there used

to be scholarship being provided for by the same sponsors. However, through undesirable outcomes and experiences with relatively stranger administrators, it led to cyclical nepotism. Specifically, scholarships were supposedly meant to be given to those in dire financial need and were discovered to have been endowed to children of the teachers, active members of parent-teacher associations, and so forth. This is a very common problematic trait of Filipinos, and has not changed for some decades (Fallows, 1987).

Due to administrative rotations within elementary schools, the principal in N10 had only begun her lead a recent few months back from time of field. Prior June of 2016, she exclaimed, "this school was a dumping ground." Initiative is observed with principal interests, setting in motion the general mood and objectives of the school. For example, despite being a middle performer in ICT integration, school N10 is a leader in the district for the health and nutrition program, beautification of school, and such. Regional recognition through competition also fuels these initiatives, providing acknowledgement for efforts being put into play. When clarified whether awards exist for ICT, the principal replied there were none including a hint of satisfaction with "thank goodness!" The principal herself seems subjectively biased towards gardening, hence the massive projects she has in priority for landscaping the campus.

Notice was also taken regarding the general outlook of leadership based on rurality, it was found that more of the Southern (more rural area) schools visibly took the survey seriously. They took ample time, and even delegated to ensure that the researcher had received the survey in good time. These little nuances entail simple sociology in terms of the development toward urban spaces. Georg Simmel (Kasinitz 1994, 30–45) translates these attitudes as a result of gradual transitioning to individualism, which is not a hard sell to the Philippine culture of crab mentality.[4]

In the long run, there is a weak sustainability of ICT practices or implementation of policies for such. Teachers who are less adept to technology tend to only use the tools "for show," and in compliance with what is required. A large part of this is due to the aging consortium of teaching staff, who find it either difficult to learn new technology, or ultimately useless due to their upcoming retirement. Closed-mindedness to paradigm shifts is a fairly common problem found in previous research. It should come to no surprise that comfort in the traditional learning environment is especially strong in rural settings.

[4] Crab mentality is a colloquial reference to a bucket of crabs and its analogy to individuals in society with the mindset of placing others down for one's own [selfish] welfare.

Infrastructure Resources

A typical computer laboratory in the schools in the municipality would have an average of 6-8 working units, with a class of 30-40 students. In usual cases, teachers work around with having one student do hands-on exercise, while 3-5 others are at the back in attendance. In other cases, the class is parted into half so there would only be 2-3 onlookers while the rest of the class work on exercises with pen and paper in the classroom. For schools without Internet, the most students can do on their working units is encode. Promising practices involved the more affluent students bringing in laptop units on their own, and a class can have as much as 3 units within the classroom. This mostly only happens in Poblacion schools with Internet signals reaching, and pupils can then research on the spot for presentations and the like.

A large majority of the responses pertaining to what can be done for improvement to advance integration was unsurprisingly (1) additional units, and (2) universal access to the Internet. The greatest hindrance to advancement in terms of integration would be the necessity of hardware and very tangible requirements such as an appropriate number of working units. Internet inaccessibility is also by far, the most common problem pointed out by all respondents after the lack of computers. More often than not, it is due to these problems, and understandably so that teachers simply opt to continue with traditional means of teaching. Uneven exposure to computers could raise greater problems with heterogenous teaching practices, and time mismanagement.

Human Factors

If we confine the school to its resources, it could be said that infrastructure would play the primary role in determining success in integration. However, because of the human capability to network and innovate, potential could be limited only to one's creativity.

Quality of people (Tearle, 2003) has been continuously highly regarded in previous research. However, it was duly pointed that high status of the posts and schools made for the good talent capital. This might not always be the case especially in peripheral schools, where it might seem like a hit or miss. It might also be important to point out that it is rare for Filipinos to seek after roles in the province, unless there exist personal connections such as birthright or naturalization.

In the emergence of new teaching methods through ICT, it is said that the simple learning of ICT skills of is not sufficient, the use of these tools for

improvement is the key to integration (Majumdar, 2015). It goes without saying that mere infrastructure tools by themselves are not what constitutes good pedagogy. On the contrary, it is found that despite subpar resource conditions, good pedagogy ultimately depends on the teacher motivation, initiative, and innovation. In this regard, given ideal conditions with good workstation to learner ratio, students should also be able to open means for self-pacing of individual needs, interests, and cognitive processes.

CONCLUSIONS

It is plausible to reach the next stage of integration, given bare minimum requirements. There simply needs to be an action plan and mutual desire by the administration and staff to improve in this aspect. Distributed Leadership, a fairly recent notion emphasizes the role of routines, tools, and situations that are produced from leadership practice. Collective interactions are what differentiate distributed leadership from mere shared leadership. These interactions, and their respective contextual situation are deemed essential for defining leadership practice (Spillane 2006).

Organizational routine was given grave importance by Sherer (Spillane 2007, 106) as a key mechanism in implementing shared goals. Routines, cited definition by the author as "repetitive, recognizable patterns of interdependent actions [...]" (Spillane 2007, 108). Subject matter was also given mild importance in designing routine, to better customize and target their efforts. Due to the interdependent nature of said routines, individuals were able to prompt without much need for the others. Hypothetically, continuous practice in a rural environment would eventually contribute to a change of behavior, that may be beneficial in the long-run.

Similar to what is happening in the current state of Philippine educational policy, a Flemish ICT model (Vanderlinde and van Braak 2010) was contextualized against the national ICT policies and curriculum standards. Notwithstanding, they might be of greater capacity to implement ICT as a pivot for instructional change. International ICT policies and influence of supranational organizations have also been considered. The proponents concluded by stating that the developed e-capacity model was limited as it did not describe general teacher conditions, as well as pupil related variables such as competencies. Human factors such as technology confidence, politics, and individual backgrounds make it difficult to create standardized practices that could be effective for a diverse set of both pupils and faculty.

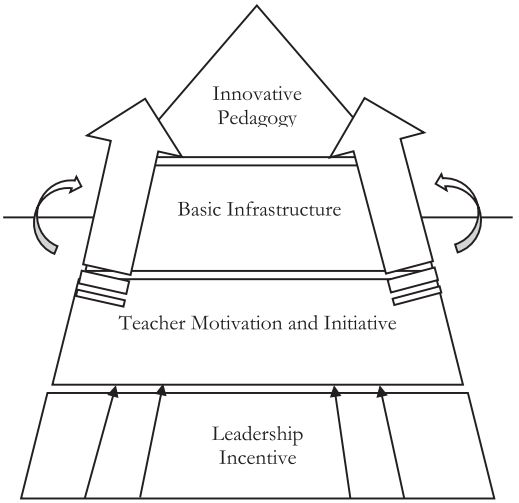

Figure 2. ICT Effectiveness Pyramid Derived from Rural Limitations

To exact these findings, Leadership and Incentive is placed at the bottom to indicate its role as a founding entity, pulling together the effectiveness itself. Momentum from this level of power creates an upward "push" and support for Teacher Motivation and Initiative, being the second level in the pyramid. This is the core substance of the research findings, showing that through enough movement from human factors, they can surpass limitations set by Basic Infrastructure and consequently go past through the next stage (dashed line at the background). Altogether, the force that pulls these movements is ultimately Innovative Pedagogy, which in this case could easily be instructional methods that push for activities and strategies that go beyond the expectations from the available resources. Restrictions lend themselves to somehow force the parties involved to innovate and be creative.

Similarly applicable is a progressive framework, roughly modified and sourced from Spillane's diagram on leadership practice stretched across time (Spillane, 2006) and the ICT Effectiveness Pyramid that would be representative of a likely situation with respect to continuous improvement of integration. Authorities above meso-level leadership might need to be involved in fulfilling this vision as budget and resources for basic infrastructure are outside (public) school level of jurisdiction. Longitudinal study is also of best interest for measuring the plausibility of this framework as it may not be apparent from short-term observation.

Typically, the present situation with provincial public schools enables them to work only with computers through encoding, or simple presentation. Internet connection would accelerate integration drastically, especially if it is not hindered by conservative notions as those commonly observed in countryside communities. Increased goals will be largely dependent on administration's open-mindedness towards the boons and banes of technology, quite particularly once open to the World Wide Web. Distinct regulation of technology use, as with any other organization, is a consideration when upgrading systems.

TRANSLATIONAL RESEARCH

The findings of the study may be best translated onto meso-level of leadership administration within schools, and also quite possibly inclusive curriculum reform.

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