Teachers' Extent of Using Multimedia Approach as 21st Century Instructional Practices in Geographically Isolated and Disadvantaged Areas (GIDA)

Cleo S. Villanueva and Jasmin D. Niguidula

***Abstract*—This study primarily investigated the teacher's level of 21st Century instructional practice in terms of multimedia approach in geographically isolated and disadvantaged areas (GIDA) in 2nd district of Capiz province. A sample of 159 out of 263 teachers in 61 GIDA barangays served as respondents. Data were statistically treated with univariate measures for the profile characteristics, Student's t test, F-test (ANOVA), Mann Whiteny U test and Kruskal Wallis H test were utilized in measuring significant differences on scores among and between independent groups, and binary logistic regression for exhausting the predictor variables for level of multi-media approach as 21st Century instructional practices of the teachers.**

Elementary school teachers in GIDA barangays of the 2nd district of Capiz sometimes use multi-media approach as 21st Century instructional practice. There are significant mean differences on the extent of use of multi-media approach of teachers when their responses were grouped according to their age and grade level handled, and barangay's land area and distance (km) from town proper.

Some of teachers' profile variables (age, sex, subjects taught, and grade level handled) and GIDA barangay's profile (distance (km) from town proper and mode of transportation) significantly predicts teacher's extent of use of multimedia approach as 21st Century instructional practice.

***Index Terms*—21st century instructional practices, geographically isolated and disadvantaged areas (GIDA), multi-media approach, rural areas.**

I. Introduction

There are powerful resources for teachers online. It is not about a lesson plan for a just in time minute. These resources help teachers to understand the use of technology, have some models for its use, create a bridge from practice now to the future, link powerful ideas and models, and new ways of working. The use of technology can change the learning landscape in the place where teachers work, but there has to be involvement, exploration, perhaps personalization, resource gathering, and understanding of the way in which technology changes teaching and learning.

The Philippine government is counting on ICTs to play a vital role in the country's development. The current ICT master plan for the Philippines dates back to 2006. With all of the new development in this highly dynamic field, there is clearly a need to develop a new blueprint on how the country and its people can benefit from the use of ICT in governance, the Philippine economy and improving one's way of life – one that is aligned to the Philippine Development Plan (PDP) 2011-2016 [1] now being rolled out by the current administration as one of the 17 sustainable development goals (SDGs) indicators, that is, to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

Since information is now readily available on the world wide web, how could education providers in the rural areas improve learner's skills to determine, integrate, and apply information in support of local living economies and thriving communities such those located in GIDA barangays?

Capiz is one of the provinces in the Philippines. The province is located in Panay Island, and dubbed as the "Seafoods Capital of the Philippines. The Province of Capiz occupies a land area of 2,633 square kilometers composed of 16 municipalities and Roxas City with a total of 472 barangays with almost half of these are considered by the Provincial Health Office as geographically isolated and disadvantaged areas (GIDA) [2], [3].

This study is important because it will determine the future development of using technology among rural teachers and students. The authorities have to plan the proper actions and then can take action to strengthen the use of ICT for rural communities. The study primarily aimed to investigate what factors significantly predicts the extent of use of multimedia approach as 21st Century instructional practice of elementary school teachers in GIDA barangays of 2nd district of Capiz. Specifically, the study aims to answer the following questions: 1) What profile can be drawn from GIDA barangays in the 2nd district of Capiz? 2) What is the socio-demographic profile of the teachers assigned in the elementary school situated at GIDA barangays in the 2nd District of Capiz in terms of age, sex, educational attainment, academic rank, subjects taught and grade level assignment? 3) What is the extent of use of multimedia approach as 21st Century instructional practice of elementary teachers? 4) What is the level of academic performance of intermediate pupils in terms of the general average in first and second grading for the School Year 2017-2018? 5) Is there a significant difference on the extent of use of multimedia approach of teachers when they are grouped according to their selected profile variables and barangay profile? 6) Is there a significant relationship between the extent of use of multimedia approach of teachers and academic performance of their intermediate pupils in the 2nd district of Capiz? and 7) What factors that significantly

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predicts the extent of using multimedia approach as 21st Century instructional practice of teachers in GIDA barangays in 2nd district of Capiz?

II. Related Literature

A. ICT in Rural Areas

The rural community is usually labeled as a poor. Although poverty also occurs in urban areas, rural area issues more often serve as hot topics in any discussion. Among the problems and challenges faced by rural communities are limited infrastructures, incapability to buy ICT equipment, lack of knowledge on ICT use, lack of skills, and lack of training in ICT use [4]. The use of ICT has great impact on its performance and plays a vital role for economic development in a country [5].

With the rapid development of ICT in development, countries globally have taken the opportunity to apply technology in raising the living standards of their people. The rapid changes in ICT products have influenced the development of technology used in the educational field [6]. The integration of ICT in Malaysian classrooms needs serious consideration in order to increase the competency of those enrolled in the country's education system [7]. The development of ICT has changed the teaching and learning process from traditional methods to a technology-based approach. Since the advent of internet technology, there has been a change in the pattern of life of communities and society around the world in education, economics, politics and socially.

Sharing and collaborating with regard to information can be equally extended to the teaching and learning process [8]. This is because the use of the internet continues to grow from time to time [9].

In 2012, the Malaysian Education Development Plan 2013-2025 placed emphasis on the use of information and communication technology in the field of education and 1 BestariNet was introduced in all government schools [10]. Correspondingly, the creation of the Smart School initiative in 1999 was a move that expected to provide a widespread application of computer technology in the educational system. The move was expected to bridge the digital divide between all communities in using technology and also to provide an opportunity for all students to explore, use, and develop various ICT skills. The success of a technology will not be achieved if the user does not accept and use that technology [11].

B. GIDA

The Bureau of Health Development defines GIDA as communities with marginalized population physically and socio-economically separated from the mainstream society and characterized by physical factors such as isolation due to distance, weather conditions and transportation difficulties as well as high poverty incidence, presence of vulnerable sectors, communities in or recovering from situation of crisis or armed conflict [3], [12].

GIDA was established through Administrative Order No. 185 institutionalizing a system for managing local health systems development in these communities to ensure provision of quality health and services. It recognized the importance of involving the community and empowering its people by giving them the sense of ownership of programs and projects.

The Committee on Health Development of the DOH performs the following functions for GIDA: 1) provide technical assistance and assist in serving funds to support GIDA, 2) establish and maintain a database on GIDA at regional level, 3) select and recommend areas for GIDA technical assistance, and 4) fund augmentation based on identified criteria. Official reports presented evidence-based surveys which prompted the agency to prioritize programs catering to GIDA.

III. Methodology

The study used the descriptive correlational research design using the designed questionnaire of Estocada (2018) for elementary school teachers in the 2nd District of Capiz and Dela Paz (2016) for the profile of selected GIDA barangays in Capiz Province. Such design was deemed to be the most appropriate to attain the objectives of the investigation. Among 76 identified geographically isolated and disadvantaged barangays located in the second congressional district in the province of Capiz, the study was conducted in 61 elementary schools located within identified GIDA barangays. The investigation covered a period of almost four months from August 28 to November 14, 2017. Stratified random sampling proportionally allocated by school were used in the study. All 61 elementary schools situated in GIDA barangays were identified and a stratified random sample of 159 out of 263 elementary school teachers were used as respondents in the study.

The collected and categorized data were analyzed using the following descriptive and inferential statistics: 1) frequency count, percentages, mean and weighted mean were used to describe the number of observations particularly for socio-demographic profile of teachers and barangay profile of GIDA barangays and extent of using multi-media approach as 21st Century instructional practice of teachers; 2) test for mean difference for two or more independent samples like Student's t-test (for two independent samples) and F-test ANOVA (for more than two independent samples) for parametric distribution and/or Mann-Whitney U –test (for two independent samples) and Kruskal-Wallis H test (for more than two independent samples) for nonparametric distribution of data; 3) measure of association (Chi-square test) or test for correlation (Pearson's r or Spearman's rho) was used to describe the relationships between extent of using multi-media approach and academic performance of pupils; and 3) Logistic Regression was used to identify the variables that significantly predict the extent of using multimedia approach as 21st Century instructional practices of teachers in GIDA barangays.

Data analyses were made through the use of IBM- SPSS (Statistical Package for Social Sciences) Statistics version 23.

IV. Results and Discussions

A. Profile of GIDA Barangays in the Second District of Capiz

A greater number (25 or 41 percent) of 61 GIDA barangays understudy had a population of less than 1000 residents with a mean of 1498 residents. More than half (35 or 57.4 percent) of the barangays have land area below 1,000 hectares with estimated mean land area of 3830.31 hectares. Majority of the GIDA barangays in the second district of Capiz have upland classification (46 or 75.4 percent) and residents ventured in farming as their main source of livelihood (60 or 98.4 percent). On the average, GIDA barangays understudy were 12.13 km away from the town proper, and majority (55 or 90.2 percent) of these barangays can be reached by the use of motorcycle; almost one in every three (20 or 32.8 percent of 61) GIDA barangays can be accessed through jeepney; six (9.8 percent) can be reached through tricycle or truck; four (6.6 percent of 61) barangays can be reached through walking or hiking; and one (1.6 percent) can be accessed by the use of boat.

B. Profile of Elementary School Teacher-Respondents

A greater number (60 or 37.7 percent) of elementary school teachers aged between 40 and 49 years old with a mean age of approximately 45.07 years old. Majority (140 or 88.1 percent) of the elementary school teacher-respondents are females; and 19 or 11.9 percent of 159 teachers understudy are males. Approximately three of every four (119 or 74.8 percent) teacher-respondents are bachelor's degree holders with masteral units or considered to be in the middle level of education. A greater number (58 or 36.5 percent) of the respondents had the lowest academic rank of Teacher I. A greater number (64 or 40.3 percent of 159) of teachers educate pupils in Araling Panlipunan. Most (97 or 61 percent) of the teacher-respondents handled 5th grade level pupils. Distinctively, 35 or 22 percent of the teacher-respondents handled both 5th and 6th grade levels.

C. Extent of Using Multimedia Approach as 21st Century Instructional Practices

Generally, elementary school teachers in the 2nd district of Capiz moderately manifested (2.80) the multi-media approach as 21st Century instructional practices, as presented in Table I. Distinctively, respondents often use the help of internet in their lessons (3.78), and have the skills in computer software and hardware (3.52). Moreover, they use technology resources to develop rubrics (3.25); their pupils sometimes use internet and other technological tools for their projects (2.68), video presentations are sometimes shown in their class (2.63), and use guiding projects sometimes to discover the capabilities of computer and their learners' technological skills, as well (2.60). However, their pupils rarely use computer to further enhance their electronic skills (2.49), rarely use online application to enhance pupils' learning (2.45), rarely provided the pupils with interactive activity with the use of computer (2.38), and rarely use projector for their class discussion (2.17).

Nearly half (78 or 49.1 percent) of the teacher-respondents moderately manifested the 21st Century instructional practices in terms of multi-media approach.

D. Level of Academic Performance of Intermediate Pupils

More than half (85 or 53.5 percent) and most (104 or 65.4 percent) of the teachers had pupils that performed very satisfactory in academics, with a mean grade of 84.79 and 86.21, for first and second grading periods, respectively.

TABLE I: Extent of Use of Multi-Media Approach As 21st Century Instructional Practices of Elementary Teachers

Multi-Media Approach Statements [13]	Weighted Mean	Verbal Interpretation
1. I use the help of internet in my lessons.	4.14	Often
2. I have the skills in computer software and hardware.	3.77	Often
3. I use projector for my class discussion.	2.75	Sometimes
4. I use technology resources to develop rubrics.	3.63	Often
5. Video presentations are shown in my class.	3.14	Sometimes
6. I use online application to enhance pupils' learning.	3.14	Sometimes
7. My pupils are provided interactive activity with the use of computer.	2.95	Sometimes
8. My pupils use internet and other technological tools for their projects.	3.32	Sometimes
9. My pupils is using computer to further enhance their electronic skills.	3.03	Sometimes
10. I use guiding projects to discover the capabilities of computer and my learners' technological skills, as well.	3.14	Sometimes
GRAND MEAN	**3.30**	**Sometimes**

E. Measure of Difference in the Extent of Using Multimedia Approach When Grouped According to Teacher's and GIDA Barangay Profile

1) Extent of Using Multimedia Approach when grouped according to Teacher's Profile

There is no significant mean difference on the extent of 21st Century instructional practices of teachers in terms of multi-media approach when their responses were grouped according to their sex, highest educational attainment, academic rank and subjects taught as given in Table II. However, when their responses were grouped according to their age and grade level assigned, significant mean variations on the scores in determining the extent of 21st Century instructional practices of teachers in terms of multi-media approach were observed.

2) Extent of Using Multimedia Approach when grouped according to GIDA Barangay Profile

No significant mean variations on the teachers' extent of using multimedia approach as 21st Century instructional practices of teachers when their responses were grouped according to GIDA barangay population, land classification, main source of income and the mode of transportation, as displayed in Table III. However, when their responses were grouped according to barangay land area and distance of barangay to town proper, significant mean variations on the scores were observed.

TABLE II: MEASURES OF MEAN DIFFERENCES ON THE EXTENT OF USE OF MULTIMEDIA APPROACH WHEN CLASSIFIED ACCORDING TO TEACHER'S PROFILE

Teacher's Profile	Type of Test	Test Value	Asymp. Sig.
1. Age	F-Test (ANOVA)	6.630**	0.000
2. Sex	Mann-Whitney U test	-0.093^{ns}	0.926
3. Highest Educational Attainment	F-Test (ANOVA)	1.289^{ns}	0.277
4. Academic Rank	F-Test (ANOVA)	0.864^{ns}	0.487
5. Subject taught			
English	Student's t test	0.207^{ns}	0.837
Science	Mann-Whitney U test	-0.592^{ns}	0.554
Math	Student's t test	0.657^{ns}	0.512
AP	Student's t test	0.710^{ns}	0.479
Filipino	Student's t test	0.894^{ns}	0.373
EPP	Mann-Whitney U test	-1.114^{ns}	0.265
ESP	Student's t test	0.344^{ns}	0.731
MAPEH	Student's t test	0.566^{ns}	0.572
6. Grade Levels Handled			
4	Mann-Whitney U test	-3.782**	0.000
5	Student's t test	-2.218*	0.028
6	Student's t test	-1.574^{ns}	0.118

** - highly significant
^{ns} – not significant
* - significant

TABLE III: MEASURES OF MEAN DIFFERENCES ON THE EXTENT OF USE OF MULTIMEDIA APPROACH WHEN CLASSIFIED ACCORDING TO BARANGAY'S PROFILE

GIDA Barangay's Profile	Type of Test	Test Value	Asymp. Sig.
1. Population	Kruskal Wallis test	3.845^{ns}	0.279
2. Land Area	Kruskal Wallis test	7.707*	0.021
3. Land Classification	Kruskal Wallis test	5.532^{ns}	0.478
4. Main Source of Income			
Farming	Student's t test	0.709^{ns}	0.479
Fishing	Student's t test	0.945^{ns}	0.349
5. Distance from Town Proper	Mann-Whitney U test	6.689^{s}	0.035
6. Mode of Transportation			
Motorcycle	Student's t test	-1.750^{ns}	0.082
Jeepney	Student's t test	-0.133^{ns}	0.894
Truck	Mann-Whitney U test	-0.268^{ns}	0.789
Tricycle	Student's t test	1.884^{ns}	0.061
Boat	Student's t test	1.849^{ns}	0.066
Hike	Student's t test	-1.029^{ns}	0.305

^{ns} – not significant
* - significant

F. Measure of Relationship between Extent of Using Multimedia Approach of Teachers and Academic Performance of Their Intermediate Pupils

There is a highly significant positive relationship between teacher's extent of using multi-media approach as 21st Century instructional practice and the academic performance of their intermediate pupils for the first and second grading periods, as shown in Table IV.

G. Predictors of Extent of Using Multimedia Approach of Teachers in GIDA Barangays in 2nd District of Capiz

For the method of binary logistic regression, all independent variables were tested as predictors of extent of use of multimedia approach of teachers. Twelve variables were considered; six of which were barangay profile variables (population, land area, geographical classification, main occupation of residents, distance (km) from town proper and mode of transportation); and six from teacher's profile variables (age, sex, highest educational attainment, academic rank, subjects taught and grade level(s) handled).

TABLE IV: MEASURE OF CORRELATION OR RELATIONSHIP BETWEEN THE EXTENT OF USE OF MULTIMEDIA APPROACH AND LEVEL OF ACADEMIC PERFORMANCE OF INTERMEDIATE PUPIL

Academic Performance of Intermediate Pupils	**Test Type**	**Test Value**	**Asym p Sig**
1st quarter grade	Spearman's rho	0.255**	0.001
	Chi-Square	10.912^{ns}	0.282
2nd quarter grade	Spearman's rho	0.217**	0.006
	Chi-Square	4.639^{ns}	0.860

** - highly significant
^{ns} – not significant

TABLE V: BINARY LOGISTIC REGRESSION (BACKWARD: WALD METHOD) SUMMARY OF PREDICTOR VARIABLES

Variables in the Equation

Predictors	**B**	**S.E.**	**Wald**	**df**	**Sig.**	**Exp(B)**
AGE	-.138	.035	15.173	1	.000	.871
Sex(1)	-1.655	.770	4.613	1	.032	.191
English(1)	1.168	.525	4.939	1	.026	3.215
EPP(1)	-1.218	.512	5.654	1	.017	.296
grade4(1)	2.036	.532	14.630	1	.000	7.663
Distance (km)	-.132	.044	8.899	1	.003	.876
transpoJEEP(1)	-4.005	1.316	9.262	1	.002	.018
transpoTRUCK(1)	-2.381	1.126	4.469	1	.035	.092
transpohike(1)	-4.318	1.439	9.002	1	.003	.013

TABLE VI: CLASSIFICATION RESULTS USING BINARY LOGISTIC REGRESSION MODEL

Observed Extent of Use of Multimedia Approach	Predicted: Extent of Use of Multimedia Approach: Multimedia approach is rarely or never manifested	Predicted: Extent of Use of Multimedia Approach: Multimedia approach is at least moderately manifested	Percentage Correct
Multimedia approach is rarely or never manifested	43	18	70.5
Multimedia approach is at least moderately manifested	11	87	88.8
Overall Percentage			81.8

81.8% of original grouped cases correctly classified.

The result of Backward Wald method of binary logistic regression used is in Table V. Out of twelve independent variables, only half (six) qualified as significant predictors of at most rare use of multimedia approach or at least moderately use of multimedia approach. These predictor variables were two barangay profile variables such as distance (km) from town proper and mode of transportation; and four teacher's

profile variables (age, sex, subjects taught, and grade level handled.

Resubstitution using the binary logistic regression model show that classified correctly were 130 out of 159 teacher-respondents with a correct classification rate of 81.8% as shown in Table VI.

V. Conclusions

Based on the findings, the following conclusions were made: 1) GIDA barangays in the 2nd congressional district of Capiz have mean population of approximately 1498 residents, with estimated mean land area of 3830.31 hectares, geographically classified as upland and residents ventured in farming as their main source of livelihood with 12.13 km away from the town proper, on the average, and can be usually reached by the use of motorcycle; 2) Elementary school teachers in the 2nd district of Capiz are in their mid-forties or in middle adulthood, mostly females, with middle level of education, with lowest academic rank, educate pupils in Araling Panlipunan, handled both 5th and 6th grade levels; 3) Elementary school teachers in GIDA barangays of the 2nd district of Capiz sometimes use multi-media approach as 21st Century instructional practices; 4) Teacher-respondents handle intermediate pupils who perform very satisfactory in academics during the first and second grading for the School Year 2017-2018; 5a) Teachers in their early adulthood sometimes use multi-media approach compare to teachers who are at least in their middle adulthood that rarely use multi-media approach. Teachers who handle pupils in Grade 4 have significantly higher extent of use of multi-media approach compare to teachers who do not handle 4th grade level, though both groups have the same extent of using multimedia approach as 21st century instructional practice which is moderately manifested; 5b) Teachers of elementary schools situated in GIDA barangays with below 1000 hectares' land area have significantly higher extent of use of multi-media approach compared to teachers of schools in barangay with at least 1,000 hectares' land area, though both groups have the same extent of using multimedia approach as 21st century instructional practice which is moderately manifested. Teachers of elementary schools situated less than 10 km from the town proper have significantly higher extent of use of multi-media approach compared to teachers of schools in barangay with at least 10 km away from town proper, though both groups have the same extent of using multimedia approach as 21st century instructional practice which is moderately manifested; 6) The higher extent of 21st century instructional practice of teachers in terms of multi-media approach, results to a higher level performance of intermediate pupils; and 7) GIDA barangay's distance (km) from town proper, mode of transportation, teacher's age, sex, subjects taught and grade level handled can predict the extent of use of multimedia approach as 21st Century instructional practice as to at most rare use of multimedia approach or at least moderately use of multimedia approach.

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