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# 21<sup>ST</sup> CENTURY SKILLS AND SCIENCE PERFORMANCE OF BSED SCIENCE STUDENTS

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## ABSTRACT

The science curriculum nowadays is pragmatically and essentially formulated to develop practical skills to cope with the demands that society is imposing. Thus, would-be science teachers should equip themselves with the concepts in science to effectively convey science breakthroughs. This study aimed to determine the level of 21st-century skills and the science performance of the BSEd Science students and the correlation between the students' 21st century skills and their science performance using an adopted questionnaire for the 21st century skills developed by Raditz et al. (2012) and a researcher-made test questionnaire for science performance. The 21st century skill level of the BSEd Science students was determined as "highly developed" and in terms of its components: critical thinking, self-management, and cooperation skills were ascertained as "highly developed." On the other hand, global relations, information and intercommunication, interpersonal communication, and creativity and innovation skills were determined as "developed." In terms of the science performance of the students, it reveals a "very satisfactory" performance. Further, it was determined that there was a significant relationship between the 21st century skills and the science performance of the students. Hence, the study recommends that science instruction may integrate 21st century skills to further enhance the competence of the students to be more competitive and responsive to the call of science teaching in the contemporary world. Active participation in science-oriented seminars and workshops is encouraged to provide students with up-to-date and informative breakthroughs to enhance their knowledge of the relevant and responsive science competencies.

*Keywords: 21st century skills, competency, contextualize, flexible, science performance*

## INTRODUCTION

The science curriculum nowadays is pragmatically and essentially formulated to develop practical skills to cope with the challenges and demands that society is imposing. One way to cope with the demands of the aforesaid concern is to hone would-be science teachers who are equipped with both scientific concepts and skills.

In this twenty-first century era, the cognitive and skill competencies mandated to be taught in science classes are far different from the conventional ones. Thus, would-be teachers should equip themselves with the concepts in science to effectively deliver and elaborate on science concepts. However, the teaching of science does not only require mastery of the science content but also the utilization of a suitable strategy to effectively attain the transfer of learning, and it is where the 21st century skills become a necessity to be equipped with those who are aiming to become science teachers.

Those who are looking forward to becoming science teachers should keep in mind that they need to teach science in the realm of the 21st century perspective since they are dealing with 21st century learners. According to Santos (2017), in a teacher-centered classroom, the source of information was only the teacher and the learning was predominantly content with a few processes, which concludes that the teaching approaches are only for students to learn and not to cater to individual differences with low relevance to the learner and often a lack of context for the learners.

Thus, the science performance of the students is an indicator of how the teacher transferred learning, and one way of attaining effective transfer of learning is by employing 21st century skills since it enables the teacher to deliver the lesson in a multifaceted way. 21st century skills enable the individual to face challenges that they will encounter in industrial society; the global economy; the influx of high technology; the ever-changing and sophisticated use of computers; and the spillover of global information (Voogt, 2008).

The growing society of the present time increases its demands, and one of those is the demand for teachers who are fully aware and equipped to teach using 21st century teaching skills. Higher education institutions play a vital role in producing quality graduates that are competitive enough to keep things in equilibrium. Thus, ascertaining the 21st century skills and science performance of BSEd Science students is an initial way of knowing the direction and designing the learning landscape to equip the students who are future science teachers with the aforesaid needed skills and competence in teaching science. Hence, the researcher decided to determine the 21st century skill level and science performance of the Bachelor of Secondary Education major in Science students to account for sufficient data in formulating enhancement activities and suitable teaching strategies to develop them to become 21st century equipped science teachers.

### **STATEMENT OF THE PROBLEM**

The primary aim of this study was to determine the level of 21st century skills and Science performance of the Bachelor of Secondary Education major in Science students for the Academic Year 2019 – 2020. Specifically, this study aimed to answer the following questions:

1. What is the level of 21st century skills of the Bachelor of Secondary Education major in Science as an entire group and according to their critical thinking skills, cooperation skills, interpersonal communication skills, creativity and innovation skills, self-management skills, global relations skills, local relations skills, and information and communication skills?
2. What is the science performance of the Bachelor of Secondary Education major in Science students?
3. Is there a significant relationship between the 21st century skills and science performance of Bachelor of Secondary Education major in Science students?

### **METHODOLOGY**

This descriptive-correlation research study was conducted among 84 randomly selected BSEd Science students of Capiz State University, Roxas City Campus where it was taken from the 106 entire population of BSEd Science students.

To determine the level of the 21st century skills and science performance of the BSEd Science students of CapSU Roxas City Campus, the researcher used an adopted questionnaire for the 21st century skills developed by Raditz et al (2012) and a 50-item researcher-made test questionnaire for the science performance. The researcher-made 50-item multiple choice type of test was subjected to content validation and reliability test which was a test-retest reliability test conducted among 30 randomly picked BSEd Science students and it obtained a correlation coefficient of 0.823 which indicates that the researcher-made test has good reliability.

Mean and standard deviation was used to analyze the responses of the respondents as to their level among 21st century skills and science performance. The level among the 21st century skills was interpreted as Highly Developed (4.21-5.00), Developed (3.41-4.20), Moderately Developed (2.61-3.40), Less Developed (1.81-2.60), and Least Developed (1.00-1.80) and as to the level of Science performance of the respondents, it was interpreted as Outstanding (39.24-50.00), Very Satisfactory (29.43-39.23), Satisfactory (19.62-29.42), Fairly Satisfactory (9.81-19.61) and Did Not Meet Expectations (0.00-9.80). Inferentially, Pearson moment of correlation was used to find out the relationship between variables.

## FINDINGS

1. The level of the 21st century skills of the BSEd Science students were “highly developed” and taking into consideration the components of the 21st century skills, it was found out that the BSEd Science students have “highly developed” skills in the Critical Thinking Skills, Self-Management Skills and Cooperation Skills and “developed” skills in the global relations skills, local relations skills, information and intercommunication skills, interpersonal communication skills and creativity and innovation skills. The finding implies that the students are well equipped with the demanded trends of society in the 21st century era and this may be due to the high support system that their family, school, and community are giving. This only shows that the students taking up a BSEd major in Science are flexible and can respond to the demand of the progress of education considering the dimensions of information, communication, ethics, and social impact. They are independent learners that can acquire learning on their own by subjecting themselves to technological exploration. Further, the BSEd Science students have the skills to contextualize science contents considering a logical claim withdrawn from various sources. Also, they can effectively collaborate to implement research-based activities and is open to feedback or comments for the improvement of the activities and project meaningful learning. Despite the highly developed skills shown by the BSEd Science students, there is a need to enhance their skills concerning competencies in terms of the organization of data in their perspective and how they should present it orally or in writing, reflecting on the societal issues anchoring to science concepts and evaluating the credibility and validity of online resources and also the applicability of these resources. The result of the study conforms to the study of Bell (2010) which discloses that students in the new milieu are proficient with viable technology skills and they are also skilled communicators and advanced problem solvers which makes them create their learning through inquiry, as well as work collaboratively to research and construct projects that reflect their knowledge. Also, the result of this study affirms the findings of Khalil et al (2014) that equipping students with 21st century skills to enable them to develop positive interdependence and individual accountability. More so, the result of this study affirms the findings of Voogt and Pelgrum (2005) as they disclose that developing 21st century skills enable the students to face the challenges that they may encounter in the industrial society, global economy, the influx of high technology and ever-changing and sophisticated use of computers, and the spillover of global information. Also, the result presented by Lai and Viering (2012) that 21st century skills shape the students to be competitive in the global arena by fostering significant facets of learning through employing a variety of learning activities and offering opportunities for students to learn in their own pace conforms with the result of this study.

**Table 1: Level of 21st Century Skills**

| Skill                                     | SD    | Mean | Interpretation   |
|---|-------|------|------------------|
| 21st Century Skills                       | 0.551 | 4.22 | Highly Developed |
| Critical Thinking Skills                  | 0.552 | 4.27 | Highly Developed |
| Cooperation Skills                        | 0.619 | 4.25 | Highly Developed |
| Interpersonal Communication Skills        | 0.638 | 4.19 | Developed        |
| Creativity and Innovation Skills          | 0.653 | 4.17 | Developed        |
| Self-Management Skills                    | 0.588 | 4.26 | Highly Developed |
| Global Relations Skills                   | 0.606 | 4.20 | Developed        |
| Local Relations Skills                    | 0.642 | 4.19 | Developed        |
| Information and Intercommunication Skills | 0.628 | 4.19 | Developed        |

2. As to the Science performance of the respondents, it was found that there was a “very satisfactory” Science performance exhibited by the BSEd Science students as a result of the researcher-made multiple choice test questionnaire and this implies that the majority of the Science competencies are mastered by the respondents and this may be due to the meaningful and engaging learning processes that they have undergone during their basic education years and on the other hand, the remaining least learned competencies may be attributed to the lack of facilities. The result of this study affirms the premise of Galinsky (2014) that high science achievement among middle school learners is influenced by essential factors such as controlling and regulating one’s thinking, emotions, and resulting behaviors by engaging them in direct and intentional self-regulating behaviors.

- In terms of the correlation test between the 21st century skills and science performance of the respondents, it was found that there was a weak positive correlation and exhibited a significant relationship. Thus, the finding implies that when students are well equipped with the 21st century skills, subsequently, their science performance will also get higher and this may be attributed to the well-designed instructional strategies that fit the generation of the students. The result of this study conforms to the findings of Figueroa (2009) where it was revealed that there is a significant association between hands-on performance and developed ICT skills among learners using computer simulation drills as an intervention. This study also affirms the findings of Sukor et al (2010) that inculcating 21st century skills in chemistry class improves student's achievement and develops well-balanced individuals, therefore, the school must provide an opportunity for the students to explore and discover knowledge in their own with the use of technology.

**Table 2: Correlation between 21st Century Skills and Science Performance**

| Variables   | N  | Pearson Correlation | Sig (2-tailed) |
|---|----|---------------------|----------------|
| 21 <sup>st</sup> Century Skills and Science Performance | 84 | 0.232               | 0.034          |

## CONCLUSIONS

The 21st century skill level of the BSEd Science Students was determined as “highly developed” and in terms of the components of the 21st century skills, it was determined that Critical Thinking Skills, Self-Management Skills, and Cooperation Skills were “highly developed” and global relations skills, local relations skills, information and intercommunication skills, interpersonal communication skills and creativity and innovation skills were determined as “developed”. Therefore, it is viewed that BSEd Science students are globally competitive, responsive, and responsible individuals who are well-equipped with the relevant knowledge and skills needed in today’s industry, that they have developed, reasoning, analyzing, synthesizing, and evaluating skills.

The science performance of the BSEd Science students was determined as “very satisfactory” wherein it is regarded that the students can most of the core science concepts.

It was determined that there is a significant relationship between the 21st century skills and science performance of Bachelor of Secondary Education major in Science students.

## RECOMMENDATIONS

It is recommended that the science instruction among BSEd Students may integrate 21st century skills to further enhance the competence of the students to be more competitive and responsive to the call of science teaching in the contemporary world and active participation in science science-oriented, workshops and fora are encouraged to provide a breakthrough among the students to enhance their knowhow of the relevant and responsive science competencies.

Science Professors may use the result of this study as a reference in formulating effective strategies in their institution to devise a new learning landscape that may enhance better the competence of BSEd Science students and other students enrolled in various programs.

The result of this study encourage the faculty to be kept abreast of the constantly changing demands of science teaching so they may align their program outcomes and teaching strategies to produce quality and globally competitive graduates.

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# PROFESSIONALISM, ORGANIZATION COMMITMENT, AND JOB SATISFACTION OF COED FACULTY MEMBERS

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## ABSTRACT

This descriptive-correlational research was conducted to determine the level of professionalism, organization commitment, and job satisfaction of the College of Education faculty. The respondents were the forty-seven College of Education faculty for the school year 2019-2020. The research instrument used in this study was an adopted survey questionnaire from the Job Satisfaction of Teacher Education Faculty study by Sabid and Tanalgo (2017). Mean and standard deviation was used for the descriptive data analysis and Pearson's  $r$  and regression analysis were used for inferential data analysis which was set at a 0.05 level of significance. The major findings revealed that the College of Education faculty were generally satisfied in terms of job satisfaction and also in terms of compensation and reward, work environment, promotion or rank, and tenure and pay or salary. Further, there was a high level of professionalism and a committed extent of organization commitment. Job satisfaction was significantly related to professionalism and organization commitment. However, professionalism and organization commitment were not significantly related. Also, professionalism and organization commitment are significant predictors of job satisfaction. This study suggests that institutions may design activities and programs to motivate, sustain and involve the faculty to give quality performance and the existing sustainable faculty development programs may be continuously reviewed and revised to suit, augment and bridge the gap in the needs of the faculty.

*Keywords: compensation, employment, job satisfaction, organization commitment, and professionalism*

## INTRODUCTION

Job satisfaction has continuously been considered a very important attribute in the labor market because of its usefulness in the measurement of workers' utility in any given workplace (Hockerman & Ilmakunnas, 2012). It can be defined as the extent to which a worker is contented with the rewards he or she gets out of his or her job, particularly in terms of intrinsic motivation (Statt, 2004). Likewise, the term job satisfaction refers to the attitude and feelings people have about their work. Positive and favorable attitudes towards the job indicate job satisfaction on the other hand, negative and unfavorable attitudes towards the job indicate job dissatisfaction (Armstrong, 2006).

As viewed by Mullins (2005), job satisfaction is a complex and multifaceted concept that can mean different things to different people. It is usually linked with motivation, but the nature of this relationship is not clear. Satisfaction is not the same as motivation. Job satisfaction is more of an attitude, an internal

state. It could, for example, be associated with a personal feeling of achievement, either quantitative or qualitative.

Job satisfaction has been a crucial issue regarding job performance and outcomes. Job satisfaction is a worker's sense of achievement and success on the job. It is generally perceived to be directly linked to productivity as well as to personal well-being. Job satisfaction implies doing a job one enjoys, doing it well, and being rewarded for one's efforts. Job satisfaction further implies enthusiasm and happiness with one's work. Job satisfaction is the key ingredient that leads to recognition, income, promotion, and the achievement of other goals that lead to a feeling of fulfillment (Kaliski,2007).

Additionally, professionalism and organization commitment are important factors in an organization and as defined by McKay (2019), professionalism refers to an individual's conduct at work, and the idea of organizational commitment refers to the relative strength of an individual's identification and involvement in a particular organization (Al-Jabari & Ghazzawi, 2019).

For any institution that aims to attain outstanding performance, foremostly, employees need to achieve a certain degree of satisfaction to affirm their sense of fulfillment and contentment. Therefore, assessing the level of job satisfaction, professionalism, and organization commitment of employees will give the institution the edge towards providing the needs of the employees in the hope of a heightened level of performance.

## **STATEMENT OF THE PROBLEM**

Primarily, this study aimed to determine the level of professionalism, organization commitment, and job satisfaction of the College of Education faculty.

Specifically, it sought to answer the following questions:

1. What is the level of job satisfaction as a whole and according to compensation and reward, work environment or employment, promotion or rank and tenure, and pay or salary of the College of Education faculty?
2. What is the level of professionalism of the College of Education faculty?
3. What is the level of organization commitment of the College of Education faculty?
4. Are there significant relationships among job satisfaction, professionalism, and organization commitment?
5. Are professionalism and organization commitment significant predictors of job satisfaction?

## **METHODOLOGY**

The descriptive-correlational research design was used in the study. The respondents were forty-seven (47) out of fifty-three (53) CoEd faculty for the school year 2019-2020. A survey questionnaire adopted from the Job Satisfaction of Teacher Education Faculty study of Sabid and Tanalgo (2017) was used in the study.

The statistical tools used were mean and standard deviation for the descriptive data analysis and Pearson's r and regression analysis for inferential data analysis which was set at a 0.05 level of significance.

## **FINDINGS**

1. The entire job satisfaction level of the respondents was determined as "satisfied." Data also shows that respondents were "satisfied" in terms of compensation and rewards, work environment or employment, promotion or rank and tenure, and pay or salary. The finding implies that the college of education faculty was satisfied in terms of compensation and reward, work environment or employment, promotion or rank and tenure, and pay or salary in the institution as it is guided by the National Budget Circular (NBC) No. 461 which allows the faculty to have rank advancement through their own qualifications and credentials. Further, the result of the NBC 461 serves as the reflection the of faculty's own determination for promotion through the pursuance of graduate studies and involvement in self-optimization through training and seminars.

**Table 1: Level of Job Satisfaction**

|                                | Std. Deviation | Mean | Verbal Interpretation |
|--------------------------------|----------------|------|-----------------------|
| Job Satisfaction               | .391           | 3.84 | Satisfied             |
| Compensation and Reward        | .424           | 3.79 | Satisfied             |
| Work Environment or Employment | .593           | 4.02 | Satisfied             |
| Promotion or Rank and Tenure   | .420           | 3.82 | Satisfied             |
| Pay or Salary                  | .565           | 3.73 | Satisfied             |

2. Considering the professionalism of the respondents, it shows that the respondents exhibited a “high” level of professionalism which implies that the respondents embody the Code of Ethics for Professional Teachers and Code of Conduct and Ethical Standards (RA 6713) in performing their duties and responsibilities. Further, it implies that the respondents should be given opportunities to emerge in seminars, orientations, and training mainstreaming educational trends, issues, and resources in the field of teaching to further enable them to be kept abreast with the professional demands and responsibilities. The result of this study conforms with the findings of Brooks (2019) that an individual with high regard for professionalism can do what is expected from them and deliver quality work because they are driven to do so.
3. In terms of organization commitment, it was found that the respondents were “committed.” This implies that the respondents have a sense of security and belongingness and display loyalty to the institution and work for the purpose of betterment for the institution. However, there are still existing options among the respondents considering venturing out of their employment for greener pasture. The result of this study corroborates with the findings of Singh & Gupta (2015) which reveal that individuals with high regard for commitment tend to express more favorable attitudes toward their work.
4. The correlation test reveals that professionalism and organization commitment has a significant relationship with job satisfaction. On the other hand, professionalism and organization commitment has no significant relationship. The result implies that job satisfaction is directly related to professionalism which means that those who have a higher level of professionalism tend to feel a higher degree of job satisfaction. Likewise, those who have a high organization commitment tend to feel a higher degree of job satisfaction, as well. Hence, professionalism and organization commitment hold a greater degree of influence on job satisfaction. However, results also reveal that professionalism is not related to organization commitment, which means that whether they exhibit high or low commitment their professionalism will remain the same.

**Table 2: Correlation among Job Satisfaction, Professionalism and Organization Commitment**

|  | Pearson Correlation | Sig (2-tailed) | Remarks         |
|--|---------------------|----------------|-----------------|
| Job Satisfaction and Professionalism         | .437                | .001           | Significant     |
| Job Satisfaction and Organization Commitment | .665                | .000           | Significant     |
| Professionalism and Organization Commitment  | .111                | .458           | Not Significant |

Legend:  $p < .05$ , significant at .05 alpha

5. In terms of predictors of job satisfaction, it was found that professionalism and organization commitment were significant predictors of job satisfaction. This implies that the level of profession and organization commitment affects the job satisfaction of an individual.

**Table 3: Predictors of Job Satisfaction**

|                         | Unstandardized Coefficients (B) | Standardized Coefficients (Beta) | T     | Sig. |
|-------------------------|---------------------------------|----------------------------------|-------|------|
| (Constant)              | 1.214                           |                                  | 3.658 | .001 |
| Professionalism         | .268                            | .405                             | 4.239 | .000 |
| Organization Commitment | .413                            | .620                             | 6.495 | .000 |

Legend:  $p < .05$ , significant at .05 alpha



## CONCLUSIONS

1. The college of education faculty were generally satisfied in terms of job satisfaction and also in terms of compensation and reward, work environment, promotion or rank and tenure and pay or salary.
2. There was a high level of professionalism and a committed extent of organization commitment.
3. Job satisfaction was significantly related to professionalism and organization commitment. However, professionalism and organization commitment were not significantly related.
4. Professionalism and organization commitment were significant predictors of job satisfaction.

## RECOMMENDATIONS

1. The institution may design activities and programs to motivate, sustain and involve the faculty to give a quality performance.
2. Sustainable faculty development programs may be continuously reviewed and revised to suit, augment and bridge the gap in the needs of the faculty.
3. Institutional policy on the compensation of the faculty may also be reviewed and revised to better serve the needs of the faculty.
4. In-service training on professionalism and organizational commitment may also be conducted to refresh and stimulate a sense of direction in the faculty.

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# FACIAL RECOGNITION FOR FUGITIVE MANAGEMENT AND CONTROL SYSTEM USING SUPERVISED-CONVOLUTIONAL NEURAL NETWORK

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## ABSTRACT

**This study focused on the development of Facial Recognition for Fugitive Management and Control System using Supervised-Convolutional Neural Network that would help solved the problems encountered by the Provincial Investigation and Detective Management Branch of Isabela, Philippines. The researcher used descriptive methodology and Agile eXtreme Programming (XP) Methodology during the system development since this technique is very helpful when there are constantly changing demands or requirements from the participants or when they are not sure about the functionality of the system. The researcher used the interview guide and survey questionnaire in the gathering of data needed. The ISO 25010:2011 Software Quality Standards were used to evaluate the effectiveness of the system developed.**

*Keywords: Facial Recognition, S-CNN, Supervised-Convolutional Neural Network, Fugitive Management and Control, Agile eXtreme Programming (XP) Methodology*

## INTRODUCTION

Social problems' point of view holds social issues, such as poverty, discrimination and the collapse of traditional social institutions contribute to crime within a community. Theorists believed that a lack of access to quality formal education, knowledge on common domestic violence, and inadequate positive socialization opportunities were tied to the prevalence of crime. Most likely societal problems are murders, theft and auto accidents caused by driving under the influence of drugs or alcohol. Violence and drug abuse are crimes that are undesirable in society.

In modern times, various socio-economic classes of people commit different crimes. Increasing urbanization largely contributes to the emergence of crimes, social norms, and laws. The transfer of rural poverty to urban areas eventually contributes to the emergence of increasing crimes in the new areas. The rate of crimes almost doubled in rich countries between 1968 and 1980 (Sheykhi, 2016).

Latest statistics show that a violent robbery occurs in the U.S. every minute with only 27% of offenders apprehended. The BAN CRIME identification system provides the Police with accurate information, maximizing arrests (Murtagh, 2012).

In the current Philippine setting, the Enhance e-Warrant System was launched in September 2020. The Philippine National Police now maintains a central database of fugitives, making copies of warrants of arrest and case files accessible to all Police Stations. Police personnel can only search for a certain case using keywords from case number, offenses, name, address, name of spouse, or any text from the fields of a certain case file.

Searching, tagging, catching, and arresting suspected fugitive is still done using the traditional way. All activities are done without decision support coming from Information Technology Tool. Thus, all operations are highly dependent on a police asset and the arresting officers discernment if the person being arrested is the real culprit or just another victim of mistaken identity.

In January to May 2018, the Philippines gained a regional average of 36.32 monthly crime index and 67.79% overall crime solution efficiency rate. Region 02 ranked 11th placed in the index crime hierar-

chy in the whole country with a monthly average crime index of 28.11 (Management PNP Directorate for Investigation and Detective, 2018).

As of 2015, the Philippine Statistics Authority reported that the province of Isabela is composed of 1,183,645 population (Philippine Statistics Authority, 2015). The province is composed of 3 cities namely, City of Ilagan, Cauayan City and Santiago City. PNP IPPO is seated at City of Ilagan which served as the center core of the province. The city has the largest human population and the widest land area among the different cities and towns of the province.

After considering the data presented, the researcher gained curiosity on the status of crime index in the province of Isabela. During the preliminary interviews conducted by the researcher at the Provincial Investigation and Detective Management Branch (PIDMB) last July 9, 2019, the researcher learned that there were more or less five hundred wanted persons in the province. The breakdown of the cases was not disclosed to adhere to the data security protocols of the agency.

The need to positively identify individuals and their criminal record will surely increase the overall crime solution efficiency rate, thereby delivering on time justice to the victims. Identification of fugitive individuals is crucial, but missing positive identification can result in fugitives evading capture, or potentially putting law enforcement and the community at risk.

## STATEMENT OF THE PROBLEM

This study was focused on the design, development, implementation, and assessment of Facial Recognition System to maximize the use of information technology tools in the identification of fugitives and help police investigators and CIDG personnel in carrying out their duties in the province of Isabela here in the Philippines.

Specifically, this study aimed to provide answers to the following problems:

1. What are the current practices of the Provincial Investigation and Detective Management Branch in criminal identification?
2. What are the problems encountered by the Provincial Investigation and Detective Management Branch in facial recognition of fugitives?
3. What facial recognition systems can be developed to address the current practices and problems encountered by the Provincial Investigation and Detective Management Branch using Supervised Convolutional Neural Network?
4. What is the extent of compliance of the developed application to ISO 25010 Software Quality Standards in terms of:
  - 4.1 Functional Suitability,
  - 4.2 Performance Efficiency,
  - 4.3 Compatibility,
  - 4.4 Usability,
  - 4.5 Reliability,
  - 4.6 Security,
  - 4.7 Maintainability, and
  - 4.8 Portability?
5. What enhancements can be done to improve the developed system?

## METHODOLOGY

### Research Design

In this study, descriptive methodology and system development were used and covers facial recognition of fugitives using Supervised-Convolutional Neural Network. Descriptive methods were used to provide process-specific descriptions vital to the development and documentation of the system that was developed. Descriptive methods were also used to discuss the effectiveness of the system as evaluated based on the ISO 25010 Software Quality Standards. The system stored digital pictures and crucial information about wanted persons in a secure database and served as a basis for cross-matching and identification when a probe image is processed using the system. A probe image was submitted by Police As-

set, CIDG Personnel, or Police Investigator to the PIDMB Chief or Officers using an android phone. The PIDMB Chief or Officers used the desktop application to process the probe image or video. The proposed system used Supervised-Convolutional Neural Network (S-CNN) algorithm to perform mathematical computations to recognize and identify the person on the probe image. A report will be provided by the system showing the identity of the person on the probe image if a match is found. Any match found from the database will automatically provide alert to the PNP IPPO, particularly the PIDMB Chief or Officers, for confirmation, dissemination and for them to initiate proper course of action.

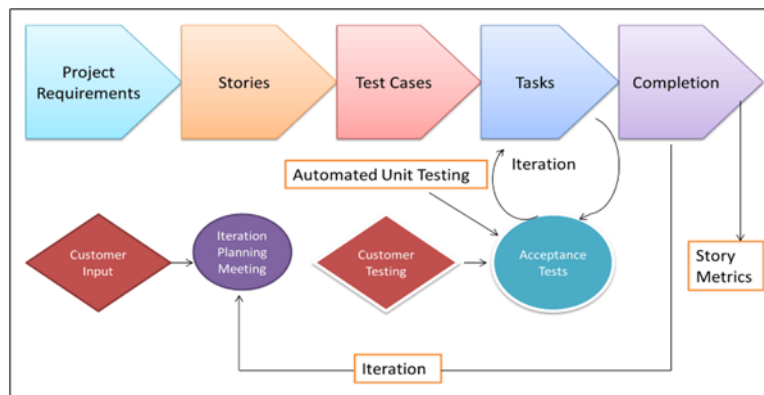
### Software Development Life Cycle

Modularity on problem isolation approach to system development is now the trend in the field of information technology where software development life-cycle agile model fits in. Agile methodologies are new software development approaches but relatively effective for both large- and small-scale projects considering its isolation techniques.

In recent years, the use of, interest in, and controversy about agile methodologies have realized dramatic growth. Anecdotal evidence is rising regarding the effectiveness of agile methodologies in certain environments and for specified projects. Moreover, eighteen agile experts around the globe organized e-workshops and conducted synchronous virtually discussions on common success factors and identified warning signs of problems in agile projects (Lindvall et al., 2002).

The above-mentioned characteristics of software development methodology were considered by the researcher and chose to use Agile Methodology. Specifically, the researcher used Agile eXtreme Programming (XP) Methodology in this study. XP methodology and phases planned for this study are presented in the following sections.

**Figure 1**  
Agile eXtreme Programming (XP) Methodology (Guru99, 2019)



Extreme Programming technique is very helpful when there are constantly changing demands or requirements from the customers or when they are not sure about the functionality of the system.

### Phases of eXtreme Programming

The following are the phases used under the agile XP model.

*Planning.* Upon careful consideration on the current situation, accessibility of information and seeking the full cooperation and willingness of PIDMB Chief and officers, the project scope, and target time frame were prepared for scheduling and discussion.

*Analysis.* A preliminary interview was conducted at the PIDMB to learn the processes or standard operating procedures vital to the proposed system. Problem identification was also done. Available resources of the PIDMB were also noted and used as basis in developing requirements specifications. In this phase, specific activities time frame is identified. System Architectural network design will be sketched up to identify the physical structure of the proposed system within the PIDMB. Hardware and Software requirements were identified and estimated for possible funding.

*Design.* Sketches of a user interface for a specific task or module of the FRFMC system were developed in this phase. Database design structure that commensurate with the Philippines wanted person list, PNP Crime Data sheet, and PNP crime index were developed. Sample aesthetic Graphical User Interface for each user will be introduced to the users.

*Execution.* Hardcoding was done in this phase. Microsoft Visual Studio – Visual Basic.Net was used as the system front-end in training the system and cross matching facial patterns using supervise-convolutional neural network algorithm. Modularity of functional decomposition approach were utilized for easy isolation of functional problem and integration of other needed requirements. The system backend for data storage on facial patterns, PNP crime data sheets and crime index used SQL Server to cater for large amounts of information. System security, usability, efficiency were the category factors as a prime priority in the development. Actual conversion of DFD, ERD, Contextual Diagram into functional codes, logical organizational of data and connections were also established.

After coding each unit or module, it underwent Unit Testing. Feedback from end users was noted by the researcher and went back to coding until iterative coding and testing successfully produced acceptable results for all modules or features.

*Wrapping.* After the researcher finished coding and unit testing of a certain module of the FRFMC System, the researcher provided small releases to the expert users for Regression Testing. The release was demonstrated by the researcher and reviewed by the expert users. Improved and most acceptable outcome was ensured through this repeated process. Alpha and Beta testing was also conducted by both IT experts and expert users from the PIDMB on the proposed system in compliance to ISO 25010:2011 Software quality standards (ISO/IEC, 2011) before deployment and implementation of the system.

*Closure.* After a series of tests, modifications and completion of the system functionality requirements and approval of the PIDMB Chief, the proposed system was pilot launched. Demonstrations and training may be provided for the expert users to gain familiarity with the use of the system. After pilot launching and training, and expert users fully accept all functionalities, the system may be fully implemented. End users technical support on the system may be discussed and put in formal agreement.

Figure 2  
System Architecture

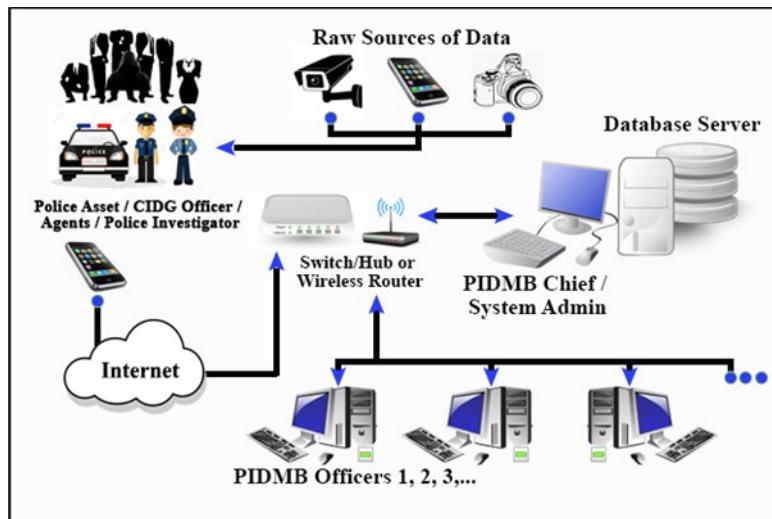


Figure 2 shows how data is gathered from raw sources and passed from Police Assets, Agents, CIDG Officers, or Police Investigators to the Provincial Investigation and Detective Management Branch Chief or Officers. The data submitted was evaluated and if the data was a new case folder, this would be recorded to the system by the PIDMB Officers. On the other hand, if the data submitted were raw images or videos, it would be entered in the system for probe image extraction. All probe images extracted were cross matched in the wanted persons database and looked for possible matches. The results of the cross-matching were used as basis for the next course of action of the PIDMB Officers.

## Participants of the Study

The participants of this study were categorized into two groups namely (a) the Expert users composed of PIDMB Chief, PIDMB Officers and the different municipal Police Investigators, Officers, and assets who were the expert practitioners. This group was subject to interview to learn the standard operating procedures (SPO) in terms of fugitive management and control (b) IT experts from ICT faculties who were responsible in the assessment of the developed system using ISO 25010 quality standards.

Participants' criteria for both groups included (a) expert practitioners are the current PIDMB Chief, Officers, Municipal Police Investigators, Officers, and Assets; (b) for IT expert, at least 5 years' experience in system development or had extensive exposure on IT research project in the industry or academe.

Participation of participants during data collection and system testing was voluntarily in nature; all data collected were treated with the utmost confidentiality.

**Table 1**  
**Distribution of Study Participants**

| Participants | Sector                          | No. of Participants | Percentage  | Task   |
|--------------|---------------------------------|---------------------|-------------|--|
| Expert users | PIDMB Chief,                    | 1                   | 89.47%      | Source of Standard Operating Procedures in terms of Fugitive Management and Control. |
|              | PIDMB Officers,                 | 5                   |             |  |
|              | Municipal Police Investigators, | 37                  |             |  |
|              | Municipal Police Officers,      | 37                  |             |  |
|              | Police Assets                   | 5                   |             |  |
| IT Experts   | ICT FACULTY                     | 10                  | 10.53%      | Assessed the developed system using ISO 25010 quality standards.                     |
| <b>Total</b> |                                 | <b>95</b>           | <b>100%</b> |  |

## Instrumentation

This section shows the different tools and methods that were used by the researcher for data gathering. This aimed to determine the problems encountered by PIDMB Chief and officers in terms of fugitive management and control that were necessary basis during the development of the proposed system.

*Interview Guide.* Interview guide questions were used to get firsthand operational feedback on the PIDMB's existing protocols in conducting investigation, detection, and apprehension of criminals.

*Survey-Questionnaire.* A questionnaire was floated to IT Experts to evaluate the developed systems compliance to ISO 25010:2011 Software quality standards.

## Data Analysis Tools

The gathered data were collected, tabulated, and treated statistically using the weighted mean and 5-point Likert Scale.

*Weighted Mean.* This was used to describe the mean assessment of the participants as to the extent of compliance of the developed system with respect to ISO 25010:2011 system quality standards.

*5 Point Likert Scale.* This was used as a measure of the extent of compliance of the developed system to ISO 25010:2011, Software Quality Standard.

Assessment of the system by IT experts was interpreted using the following table.

**Table 2**  
**Likert Scale for the Measurement**

| Range       | Verbal Description |
|-------------|--------------------|
| 4.20 – 5.00 | Very Great Extent  |
| 3.40 – 4.19 | Great Extent       |
| 2.60 – 3.39 | Moderate Extent    |
| 1.80 – 2.59 | Little Extent      |
| 1.00 – 1.79 | Very Little Extent |

## RESULTS AND DISCUSSION

### Current Practices

Part of the standard operating procedures of the PIDMB in collecting and maintaining fugitive records are as follows:

- A complaint was filed in the Police Station.
- A police officer processed the complaint and obtained the details of the complainant and the person being accused.
- All details were kept in a folder called the case folder.
- The complaint was then forwarded to the fiscal's office to determine if there was probable cause.
- If a fiscal finds probable cause, it will be filed to a proper court for issuance of a criminal case number.
- A trial will then be scheduled; issuance of order from the court is done (warrant of arrest/search warrant).
- The PNP will then serve the order to the accused and forward a copy of the case folder to PIDMB.
- Case folders were kept in the Provincial Investigation and Detective Management Branch.

### Problem Recognition

After analysis of data collected, the researcher found the following problems encountered by the PIDMB in facial recognition of fugitives.

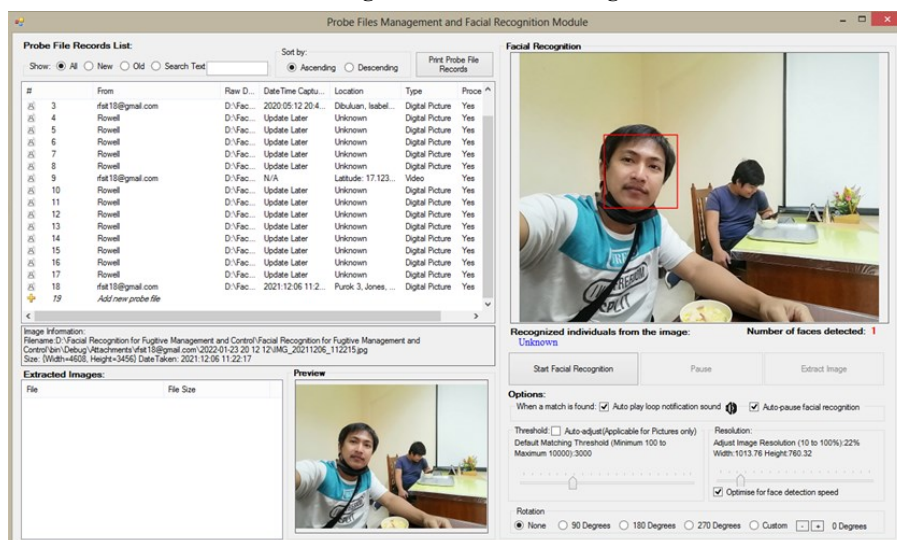
- Manual facial recognition
- Un-timely decision
- No facial recognition support system

Police Officer on the field manually recognizes fugitives based on a printout on hand. This will require more time in making decisions. The hit maybe wasted, which will lead to evasion of fugitive when the police officer can't recognize it on time. All mentioned problems were caused by having no facial recognition support system.

### The developed system to address the problems encountered

The FRFMC is composed of two major components the FRFMC server which served as the data center of the system, and an Android Application which served as source of probe files that are used as search key information in the system. The FRFMC Server stores fugitive records and their face IDs. Records can be manually added to the system individually or it can be imported from Excel files. Face IDs on the other hand, should be added individually per record.

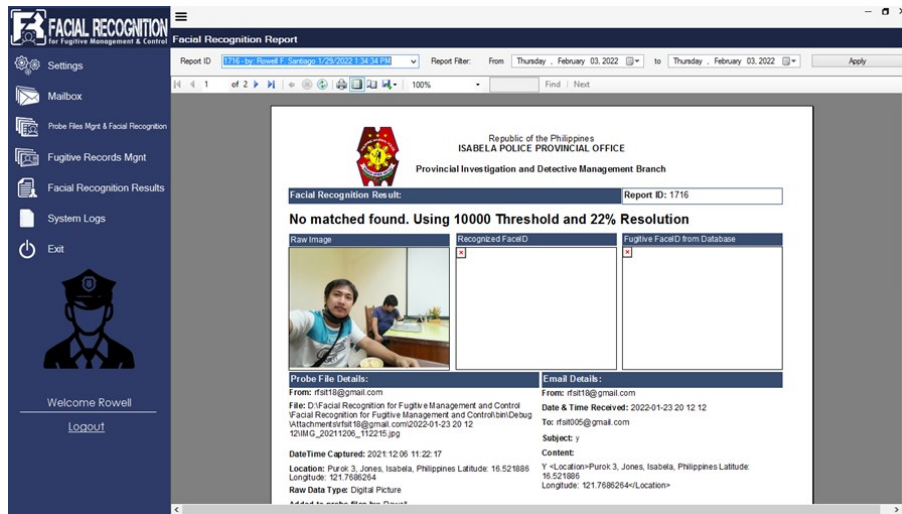
**Figure 3**  
**The Probe file Management and Facial Recognition Module**





This is the main core of the system which uses Supervise-Convolutional Neural Network to identify and recognize faces in the probe file. Settings from the settings module are automatically applied when this module is activated. If a fugitive is recognized, this module will trigger the alarm set in the settings module. Results of the scan are available in the Facial Recognition Results Module.

**Figure 4**  
**The Facial Recognition Report**



This module is used to show results of facial recognition scans. The scan details are presented in the report such as source of the probe file, date and time of the scan, scan result, threshold and resolution used. If a match is found the fugitive’s record is also included in the report.

### The extent of compliance of the developed application to ISO 25010 Software Quality Standards

**Table 3**  
**Summary on the Extent of Compliance of the Developed System to ISO 25010:2011**

| Indicators                   | IT Experts  |                          |
|------------------------------|-------------|--------------------------|
|                              | Mean        | Description              |
| a. Functional Suitability    | 4.53        | Very Great Extent        |
| b. Functional Efficiency     | 5.00        | Very Great Extent        |
| c. Performance Compatibility | 4.60        | Very Great Extent        |
| d. Usability                 | 4.84        | Very Great Extent        |
| e. Reliability               | 4.70        | Very Great Extent        |
| f. Security                  | 5.00        | Very Great Extent        |
| g. Maintainability           | 4.84        | Very Great Extent        |
| h. Portability               | 4.93        | Very Great Extent        |
| <b>Overall Weighted Mean</b> | <b>4.81</b> | <b>Very Great Extent</b> |

Table 3 shows the overall assessment of IT experts on the extent of compliance of the developed system, “Facial Recognition for Fugitive Management and Control System” to ISO 25010:2011 software quality standards. The participants rated 8 out of 8 indicators as Very Great Extent of compliance, having an overall weighted mean of 4.81. This implies that the developed system met the international software standards in terms of software quality.

The increasing recognition of the importance of software quality causes a shift in the “center of gravity” of software engineering from creating a technology-centered solution towards satisfying the stakeholders’ spectators. Software development organizations that are confronted with such a shift are, in general, not adequately equipped to deal with it. But recently, they did not have at their disposal the quality-related measurement instruments that would allow (or “facilitate”) the engineering of quality throughout the entire software product life cycle (Witold et al, 2013).

## **Suggested Enhancements that can be adopted for the Developed Facial Recognition for Fugitive Management and Control System**

Upon series of testing and deployment of the developed system in the actual environment, the PIDMB Chief and Personnel suggested enhancements as follows:

- Threshold used and resolution used during facial recognition should be included in the facial recognition report.
- Use threshold ranges that provide acceptable result accuracy to avoid misleading results.
- Importing Fugitive Records from Excel file should be included to make Fugitive Record Management faster.
- If image resolution is too high, automatically reduce it before saving to ensure processing time is minimized.
- There should be a mechanism for sender registration so that only registered senders will be processed by the system.

## **SUMMARY OF FINDINGS**

### **Current Practices**

After a series of interviews the following are identified as the current practices of the participants. There is a standard operating procedures being followed by the PNP officers in gathering and storing case folders. The PIDMB serves as the central storage point for case folders within the province. There is a system of coordination between police stations in terms of information dissemination but timely challenged.

### **Problem Recognition**

Data obtained from survey questionnaires and interviews on the participants revealed that there is no technology used in facial recognition and it is done manually. Decision is hardly made by the police officer which causes delay. There is no facial recognition support system. Fugitives can continuously evade pursuits when they are not recognized.

### **The developed system to address the problems encountered**

The developed system, Facial Recognition for Fugitive Management and Control generally performs Facial Recognition on demand. Police officers must send a probe file to the server and continue on its surveillance while waiting for the server response. When a positive identification has happened, the PIDMB Chief or Officer will give swift feedback to the police officer, making it a basis for further processing of the suspected criminal.

### **The extent of compliance of the developed system to ISO 25010**

The developed system “Facial Recognition for Fugitive Management and Control System” was generally found to be compliant with an assessment description of Very Great Extent. This shows the usefulness, functionality, and completeness of the system in support of PIDMB operations.

### **Enhancement that can be adopted for the developed system**

Mostly of the suggestions made by end users were incorporated into the system. IT experts suggest the following for future enhancements on Facial recognition:

1. Facial recognition should consider more detailed identification like jaw lines, cheekbones, and eyes comparisons.
2. Consider Facial Recognition implemented in a web application.

## **CONCLUSION**

Based on the findings, the developed system has met its intended functional operations to provide facial recognition support for police officers; received probe files from them; decrypt probe files received; and recognized and identified possible matched files.

The developed system has met all the required technical and user requirements set by PIDMB and it is fully compliant to ISO 25010:2011 Software Quality Standards. The system is a great help to the PIDMB Chief, PIDMB Officers, Police Officers, and investigators during a pursuit of a suspected fugitive. The police officers are given support in terms of fugitive facial recognition through the immediate feedback coming from the facial recognition system and the PIDMB chief or officers when a match is found.

## **RECOMMENDATION**

Based on the findings and conclusions, the researcher recommends the following:

1. Conduct of demonstration and training to the PIDMB Chief, PIDMB Officers, and Police Officers on the installation, use, and maintenance of the developed system for their familiarization and mastery.
2. The PIDMB to conduct mass information dissemination to the different police stations and officers in the province to maximize the use of the facial recognition system;
3. The PIDMB to test the developed system in a wider scope to ensure its functionality and subject the system to a regular continued improvement and monitoring scheme; and
4. Future researchers are recommended to enhance the developed system, which may include further functionalities such as facial recognition based on jaw lines, cheekbones and eye patterns.

## **ACKNOWLEDGMENT**

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Above all, to our Heavenly Father, the source of wisdom and strength.

TO GOD BE ALL THE GLORY

- The Researcher

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# **BEST PRACTICES, CHALLENGES, AND IMPACT OF ACCREDITATION IN HIGHER EDUCATION INSTITUTION**

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## **ABSTRACT**

Accreditation and quality assurance are essential factors that complete the organizational ecosystem. In the Philippines and in other parts of the world, one of the acceptable measures of quality assurance in education is voluntary accreditation. This paper determined the best practices, challenges encountered and impact of accreditation in higher education institutions. Descriptive research was utilized in this study. The respondents were 123 randomly selected faculty members of the Iloilo State College of Fisheries. A Likert Scale accreditation survey instrument was utilized to gather the data. The mean scores were calculated to analyze the gathered data. Results revealed that complete and properly labelled documentation, conduct periodic faculty performance evaluation, development of research agenda and program, establishment of strong partnership with government and non-governmental organizations, implementation of programmed extension activities involving students and faculty and allocation of budget for accreditation were highly practiced by the institution in preparation for accreditation. Challenges considered very serious were unavailability of laboratory equipment and facilities and inadequate physical plant and facilities. Accreditation had powerful impact on professional development and instructional effectiveness. It had also high impact on the academic learning environment of the school, on school leadership and management and use of resources. Improvement of physical facilities and acquisition of state-of-the art laboratory equipment be given priority and attention by the administration to meet the standard requirements prescribed by the regulatory agencies. It is recommended that periodic evaluation by internal and external accrediting agencies be conducted for feedbacking, constructive criticism and continuous improvement.

*Keywords: accreditation, best practices, challenges, higher education institutions, impact*

## **INTRODUCTION**

Every higher education institution in the Philippines struggle to create processes of quality assurance and continuous improvement to demonstrate and ensure its service to students and community. Accreditation is one way to ensure that an institution is at par with other leading institutions in the country. It is a system of assessment based on the standards of an accrediting agency, and a means of assuring and upgrading the quality of education. An institution undergoes a process of accreditation to measure and improve the quality of academic programs through self-evaluation and peer judgment. The process leads to grant an institution an accredited status by an accrediting agency and provides public recognition and information on educational quality.

Higher education sector is the biggest and important contributor to prepare students to be globally competitive and help strengthen economic growth. Higher education institutions make every effort to achieve responsive and quality programs to meet and keep pace with the trends of global competitive-

ness. To confirm that quality standards are being met and complied, higher education institutions undergo a certain process to confirm that they meet a strict and recognized set of services and operational standards. With the pace of change accelerating, and people are increasingly mobile, institutions have begun to embrace quality assurance to keep pace with globalization and internationalization.

Education empowers people to transform from a human being to having human resources. In present context of globalization, quality higher education is needed to uplift creativity, talent, adaptability and research mindset. In order to fully utilize the outcomes of education, it is important to ensure that education is meeting the minimal prescribed standards to fulfill ever-changing requirements worldwide. Accreditation, a powerful tool of quality assurance, is used to assess the national system of higher education (Kumar, Shukla and Passey, 2020).

Accreditation is the catalyst and gatekeeper of quality assurance in the education enterprise. Overtime, this process has been considered and commonly accepted as an integrative institution-wide effort and comprehensive paradigm to assure quality in educational institutions, especially in the tertiary level (Corpus, et al, 2012). Accreditation is a process by which an institution at the tertiary level evaluates itself as a whole entity or its educational activities, in whole or in part, and seeks an independent judgment to confirm that it substantially achieves its objectives, and in general equal in quality to comparable institutions (Corpus and Ngohayon, 2012). According to Sapitula, et al. (2012), it is axiomatic that the accredited programs in a college or university are the biggest barometer of quality assurance and institutional integrity. The more accredited programs an institution has, the higher esteem and pre-eminence accorded to it.

The Accrediting Agency of Chartered Colleges and Universities, Inc. known as AACCUP, Inc. since its establishment in 1987 has guided and helped State Colleges and Universities in the Philippines in their quest for quality and excellence. According to Rivera (2012), AACCUP strategically has put in place a system that externally assess the quality of provisions of degree offerings among chartered colleges and universities. This external assessment of quality will drive these institutions to improve continuously and further enhance the quality not only of the provisions of the degree offerings but critically to improve the overall quality of higher education programs they offer.

Being aware of the importance and relevance of quality assurance, the Iloilo State College of Fisheries (ISCOF) continuously strives for accreditation of all its programs by the AACCUP. ISCOF voluntarily, willingly and continuously subjecting its programs to the non-stop cycle of AACCUP accreditation to attain its vision of becoming the premier academic institution in Southeast Asia. Among the thirteen (13) graduate programs of ISCOF, four (4) have accreditation status of Level II Re-Accredited, six (6) were Level I Accredited and one (1) candidate status as certified by AACCUP. Two graduate programs will undergo Preliminary Survey Visit this 2022. For undergraduate programs, ten (10) programs were accredited Level III, fourteen (14) programs were Level II Re-accredited, and two (2) programs have candidate status. Two (2) programs have still to pursue its accreditation next year.

In line with this, the researchers were prompted to determine best practices in the preparation for accreditation, challenges, and the impact of accreditation as the institution gears up towards the never-ending quest for quality of higher education.

## **STATEMENT OF THE PROBLEM**

This study was conducted to determine the best practices, challenges encountered and impact of accreditation in Iloilo State College of Fisheries.

Specifically, it sought to answer the following:

- 1) What are the best practices in the preparation for accreditation in terms of (a) documentation, (b) instruction, (c) research, (d) extension and (e) administrative support?
- 2) What are the challenges encountered during accreditation?
- 3) What are the impacts of accreditation in terms of (a) instructional effectiveness, (b) professional development, (c) academic learning environment, (d) school leadership and management and (e) use of resources?

## METHODOLOGY

### Research Design

In this study, descriptive method was used. Descriptive research involves observation and description of variables as they are distributed throughout a population (Crowl, 1993). Gay (1996) defined descriptive method of research as a process that involved collection data in order to test the hypothesis or to answer the questions concerning the status of the subject of the study at a particular time. Descriptive, in the sense that information is collected from a group of people in order to describe some aspects or characteristics of the population of which that group is a part (Fraenkel and Wallen, 2003).

### Locale/Study Site

This study was conducted among the faculty members of ISCOF, a state institution of higher learning in the province of Iloilo. Its main campus is located in Tiwi, Barotac Nuevo, Iloilo and its four (4) external campuses located in Barotac Nuevo, Dingle, Dumangas and San Enrique, Iloilo. Most accreditable programs of the five (5) campuses have undergone AACCUP accreditation and working sustainably to level up their accreditation status.

### Respondents

The respondents of the study were 123 randomly selected faculty members for academic year 2019 - 2020. Slovin's Formula was used to determine the sample size. The multi-stage stratified proportionate simple random sampling was employed in the selection of the respondents of the study.

Sample size from each campus was proportionately selected. The proportion for each subgroup was computed by dividing the number in each subgroup by the total population. The result was multiplied by the total sample size to determine the sample size for each subgroup.

The respondents from each course were selected using the lottery or fish bowl method. Slips of paper with the name of the respondents were properly mixed inside the bowl. Samples were picked individually until the desired sample size was reached.

### Procedure

Permission to conduct the study was obtained from the offices of the College President, Vice President for Academic Affairs and channeled through the Deans and Campus Administrators. When permission was granted, the researchers personally distributed the research instrument among the faculty members of ISCOF.

### Instrumentation

An adopted and validated accreditation survey instrument was utilized. Part I included items on best practices in the preparation for accreditation. To determine the best practices in preparation for accreditation, the researchers employed the following scale of means and their corresponding description:

|             |                    |
|-------------|--------------------|
| Mean Score  | Descriptive Rating |
| 2.30 - 3.00 | Highly Practiced   |
| 1.65 - 2.29 | Less Practiced     |
| 1.00 - 1.64 | Never Practiced    |

Part II contained the list of common challenges encountered during accreditation. To determine the common problems encountered during accreditation, the researchers employed the following scale of means and their corresponding description:

|             |                    |
|-------------|--------------------|
| Mean Score  | Descriptive Rating |
| 2.30 - 3.00 | Very Serious       |
| 1.65 - 2.29 | Less Serious       |
| 1.00 - 1.64 | Not serious        |

Part III consisted of items adopted from the New England Association of Schools and Colleges (NEASC, 2006) that measured the degree of impact of accreditation on the programs accredited in terms

of instructional effectiveness, professional development, academic earning environment, school leadership and management and use of resources. To determine the impact of accreditation, the researchers employed the following scale of means and their corresponding descriptions:

| Mean Score  | Descriptive Rating |
|-------------|--------------------|
| 3.25 – 4.00 | High Impact        |
| 2.50 – 3.24 | Moderate Impact    |
| 1.75 – 2.49 | Less Impact        |
| 1.00 – 1.74 | No impact at all   |

The data gathering instruments used in this study underwent a face and content validation by a panel composed of five members who were considered experts in the field of research and accreditation. Results of the validation done by the panel on the above instruments revealed that all items were found to be acceptable.

### Data Analysis

The data gathered were computed using descriptive statistics. The obtained mean scores were utilized to describe the impact of accreditation, challenges, and best practices in preparation of documents for accreditation.

## RESULTS AND DISCUSSIONS

### Best Practices in Preparation for Accreditation

As shown in Table 1, complete and proper labelling of documents (M = 2.80), conduct of mock accreditation (M = 2.79), preparation of program performance profile (PPP) (M = 2.72), accomplishing self-survey report (M = 2.68) and complying recommendations (M = 2.62) from the last survey visit were highly practiced by the faculty who are members of the Accreditation Task Force. Accreditation task force was organized in each college to organize and prepare documents in the ten (10) areas of accreditation. All documents and reports needed for accreditation visit are properly packaged and labelled for easy reference and retrieval. Members of the task force work hand in hand in the preparation of the Program Performance Profile (PPP). The preparation of compliance report is also given priority. Mock accreditation is conducted to determine how prepared the documents for the formal visit. The internal assessment team is formed, and local accreditors are assigned based on their area of expertise. Less practiced are involving all stakeholders, designing, and developing program assessment and evaluation as well as templates in collecting, organizing, and presenting documents in the PPP.

**Table 1: Best Practices in Preparation of Documents for Accreditation**

| Category   | Mean (M) | Description      |
|--|----------|------------------|
| Documents are complete and properly labelled                                 | 2.80     | Highly Practiced |
| Self survey report fully accomplished.                                       | 2.68     | Highly Practiced |
| Recommendations from the last survey visit are promptly complied.            | 2.62     | Highly Practiced |
| Conduct of Mock Accreditation  | 2.79     | Highly Practiced |
| Development of templates in collecting, organizing, and presenting documents | 2.16     | Less Practiced   |
| Program Performance Profile (PPP) fully prepared.                            | 2.72     | Highly Practiced |
| Design and development of Program assessment and evaluation                  | 2.10     | Less Practiced   |
| Involvement of all stakeholders  | 2.08     | Less Practiced   |

In terms of instruction, it was evident that faculty highly practiced the following: periodic evaluation of faculty performance (M = 2.68), use variety of teaching strategies, methods, approaches and techniques (M = 2.60), feedbacking and mentoring activities for students (M = 2.55), periodic review of the



curriculum (M = 2.52), regular student advising and consultation (M = 2.49), development and revision of instructional materials (M = 2.45) and the conduct of enhancement classes for programs with board examinations (M = 2.38). The results were shown in Table 2.

**Table 2: Best Practices in Preparation for Accreditation in terms of Instruction**

| Category  | Mean (M) | Description      |
|---|----------|------------------|
| Periodic curriculum review  | 2.52     | Highly Practiced |
| Instructional materials development and revision                          | 2.45     | Highly Practiced |
| Use of variety of teaching strategies, methods, approaches and techniques | 2.60     | Highly Practiced |
| Conduct of regular student advising and consultation                      | 2.49     | Highly Practiced |
| Conduct periodic faculty performance evaluation                           | 2.68     | Highly Practiced |
| Conduct enhancement classes for programs with board examinations          | 2.38     | Highly Practiced |
| Feed backing and mentoring activities for students.                       | 2.55     | Highly Practiced |

Development of research agenda (M = 2.69), conduct research capability building (M = 2.65), monitor research output regularly (M = 2.51) and provision of institutional support for research activities (M = 2.45) were highly practiced in preparation for accreditation. Less practiced are sourcing of funds (M = 2.22), continuous linkages (M = 2.22), publication in research journals (M = 2.22) and providing incentives for outstanding research outputs (M = 2.08). This implies that the administration had to establish linkages with national and international institutions and agencies and to be resourceful in outsourcing of funds. Incentives be provided for outstanding research outputs to motivate teachers to conduct research and publish their outputs in national and international journals. Data were presented in Table 3.

**Table 3: Best Practices in Preparation for Accreditation in terms of Research**

| Category   | Mean (M) | Description      |
|--|----------|------------------|
| Develop research agenda and program  | 2.69     | Highly Practiced |
| Conduct research capability building through trainings and workshops.            | 2.65     | Highly Practiced |
| Provide institutional support for research activities.                           | 2.45     | Highly Practiced |
| Sourcing fund from other institutions and agencies.                              | 2.22     | Less Practiced   |
| Providing incentives for outstanding research outputs.                           | 2.08     | Less Practiced   |
| Regular monitoring of research progress and outputs                              | 2.51     | Highly Practiced |
| Continuous linkage with national and international research institutions.        | 2.22     | Less Practiced   |
| Publication of research outputs in national and international research journals. | 2.22     | Less Practiced   |

Complementing instruction and research was the extension function which includes empowering human resources by enhancing their capability through skills training, organizing and active participation in community development. The extension unit of the institution has established partnership with government and non-government organizations such as the local government units (M = 2.62). Involvement of faculty researchers and students in implementing extensions activities (M = 2.62) is considered by respondents as highly practiced. This provides greater assurance of application of the technology they have generated.

**Table 4: Best Practices in Preparation for Accreditation in terms of Extension**

| Category  | Mean (M) | Description      |
|---|----------|------------------|
| Establishing strong partnership with government and non-governmental organizations.       | 2.62     | Highly Practiced |
| Optimizing involvement of faculty extension specialists in training extension workers.    | 2.55     | Highly Practiced |
| Involving faculty researchers in extension work.  | 2.60     | Highly Practiced |
| Planning and conducting activities such as consultations with local government officials. | 2.45     | Highly Practiced |
| Implementing programmed extension activities involving students and faculty.              | 2.62     | Highly Practiced |
| Extend technologies/ activities which are the product of research.                        | 2.57     | Highly Practiced |
| Conduct benchmarking activities   | 2.60     | Highly Practiced |

Administrative support plays an important role in the attainment of any endeavor like accreditation. A specific budget was appropriated for accreditation in the annual procurement plan of each college (M = 2.82) in the higher education. This budget is to be used for supplies and materials for reproduction and organization of documents and. Each college in the institution established an accreditation center (M = 2.72) where accreditation documents are stored and an accreditation coordinator was designated (M = 2.77) to facilitate the preparation before, during and after the visit. There is also continuous upgrading and improvement of facilities and laboratories (M = 2.60).

Less practice was the grant of accreditation incentives (M = 2.03). The task force members worked overtime even during off hours and weekends. Respondents agreed that they were not given incentives to pay off their sacrifices. This implies that the administration may consider giving of accreditation incentives to the members of task force who have contributed much to the success of accreditation visit.

**Table 5: Best Practices in Preparation for Accreditation in terms of Administrative Support**

| Category  | Mean (M) | Description      |
|---|----------|------------------|
| Establishment of Accreditation Center   | 2.72     | Highly Practiced |
| Designating Accreditation Coordinator   | 2.77     | Highly Practiced |
| Sending faculty members to train as accreditors.  | 2.40     | Highly Practiced |
| Availment of accreditation fund assistance from CHED.   | 2.46     | Highly Practiced |
| Provide assistance for faculty development in terms of scholarships and thesis/ dissertation assistance.        | 2.65     | Highly Practiced |
| Allocation of budget for accreditation.   | 2.82     | Highly Practiced |
| Continuous upgrading and improving of facilities and laboratories.  | 2.60     | Highly Practiced |
| Continuous subscriptions to academic and professional journals and acquisition of books and library facilities. | 2.49     | Highly Practiced |
| Grant of accreditation incentives   | 2.03     | Less Practiced   |
| Conduct of post accreditation conference  | 2.60     | Highly Practiced |

### Challenges in Accreditation

Results shown in Table 6 revealed that challenges considered very serious were unavailability of equipment (M = 2.35) and facilities and inadequate physical plant and facilities (M = 2.34). Less serious were insufficient library facilities and holdings (M = 2.20), limited research of faculty (M = 2.17), laboratory facilities do not conform with acceptable standards (M = 2.17), lack of administrative support (M = 1.94), educational qualifications of the faculty not vertically aligned (M = 1.88), inadequate extension activities of the faculty (M = 1.86), lack of cooperation among faculty and staff (M = 1.80), and documents not properly prepared (M = 1.77). Assignment of task force (M = 1.54), curriculum does not conform with the standards (M = 1.54) and inappropriate behavior of accreditors were not serious problems (M = 1.46). This implies that physical facilities, equipment, and laboratories be given priority by the administration in order to meet the requirements of the accrediting body. To meet the requirement in physical facilities and laboratories, there is a continuous upgrading and improvement of facilities and equipment. Members of the task force know their responsibilities and willing to take an extra mile to

prepare the required documents. Accreditors were fully trained to give their professional and unbiased judgments and observed professionalism during accreditation.

According to Prado (2018), accreditation has tangible impact on school factors. Financial resources have tremendously been increasing as a result of accreditation. CHED and other financial institutions always consider the accreditation status of the school prior to granting of financial assistance. These indicators are closely followed by “improved instruction”, “made school accountable” and “exposed school to new learning trends and innovations”.

**Table 6: Challenges during Accreditation**

| Category  | Mean (M) | Description  |
|---|----------|--------------|
| Documents not properly prepared                                   | 1.77     | Less Serious |
| Unavailability of equipment and facilities                        | 2.35     | Very Serious |
| Inadequate physical plant and facilities                          | 2.34     | Very Serious |
| Assignment of task force  | 1.54     | Not Serious  |
| Inappropriate behavior of accreditors                             | 1.46     | Not Serious  |
| Limited researches of faculty                                     | 2.17     | Less Serious |
| Inadequate extension activities of the faculty                    | 1.86     | Less Serious |
| Laboratory facilities do not conform with acceptable standards    | 2.17     | Less Serious |
| Insufficient library facilities and holdings                      | 2.20     | Less Serious |
| Lack of administrative support                                    | 1.94     | Less Serious |
| Curriculum does not conform with the standards                    | 1.54     | Not Serious  |
| Educational qualifications of the faculty not vertically aligned. | 1.88     | Less Serious |
| Lack of cooperation among faculty and staff                       | 1.80     | Less Serious |

### Impact of Accreditation

The results revealed that accreditation has high impact on instructional effectiveness ( $M = 3.48$ ). Instruction was enhanced through the use of effective methodologies and periodic review of the curricular offerings. Consequently, there was a significant improvement in the licensure performance of graduates in the different programs. Another evidence that accreditation has effectively improved instruction is the granting of the program as Center of Development (COD) in Fisheries, a distinction given by CHED. Center of Excellence (COE)/ Center of Development (COD) is granted to either a public or private institution that had demonstrated the highest degree or level of standard along the areas of instruction, research, extension and production. In achieving the coveted status of COE/ COD, a program must have higher level of accredited status.

The result is supported by the analyses of Ngohayon and Balintao (2011). According to them, as state universities and colleges (SUCs) in the Philippines improved in their accreditation statuses reflecting an overall improvement in their quality and standards, their student population increased, their passing rate in licensure examinations improved, their status as center of development/excellence enhanced, their conversion into state university from being a state college hastened and their learning environments substantially improved.

**Table 7: Impact of Accreditation in terms of Instructional Effectiveness**

| Category  | Mean (M)    | Description        |
|---|-------------|--------------------|
| Participation in the accreditation process has enhanced effective methodology in the delivery of quality education.                               | 3.55        | High Impact        |
| Accreditation process has led to significant improvements in student's academic achievement.  | 3.35        | High Impact        |
| Accreditation brought significant improvement in the teaching and learning process.   | 3.49        | High Impact        |
| Accreditation enabled my institution to regular review and revisit curricular offerings to match the current demands of local and global markets. | 3.57        | High Impact        |
| Participation in accreditation has led to improvements in the quality of classroom instructions   | 3.45        | High Impact        |
| <b>Instructional Effectiveness</b>  | <b>3.48</b> | <b>High Impact</b> |

Accreditation has high impact on professional development ( $M = 3.49$ ). ISCOF encourages and support its faculty to pursue graduate education through its Faculty/ Staff Development Program for their professional development. Most of the faculty members are doctoral and master's degree holders. Facul-

ty members who are enrolled in ISCOF have the benefit of free tuition. Others were granted by full scholarship, and dissertation or thesis assistance. Further, faculty members were also sent to trainings, seminars and conferences related to their field of specialization to upgrade their competencies. Some faculty researchers have presented research papers and others won awards in the regional, national, and international research fora. In-service trainings, seminars and workshops were also conducted as well as regularly sending faculty members to seminars and conferences. Viuya and Lagasca (2012) stressed that another very significant impact of accreditation is in the professional development.

**Table 8: Impact of Accreditation in terms of Professional Development**

| Category   | Mean (M)    | Description        |
|--|-------------|--------------------|
| The accreditation process has resulted in better communication among faculty, non-teaching personnel, students and other stakeholders.                 | 3.34        | High Impact        |
| Participation in the accreditation process promoted collaboration, teamwork among school personnel that led to a more collective decisive process.     | 3.51        | High Impact        |
| Participation in the accreditation process has led to improvements in the academic environment, including the classroom and non-classroom environment. | 3.46        | High Impact        |
| Accreditation promotes academic environment that foster imaginative, creative and productive activities.   | 3.52        | High Impact        |
| Accreditation helps create sound and challenging academic environment in the Institution   | 3.52        | High Impact        |
| <b>Academic Learning Environment</b>   | <b>3.47</b> | <b>High Impact</b> |

Respondents agreed that accreditation has high impact on school leadership and management (M = 3.32). Despite the inadequate financial support from the government, the institution has effectively focused its resources to continue improving and expanding its programs and services. Accreditation process was a good way to prioritize realizing the school’s mission and achieving goals and objectives and discuss with financial authorities how to implement the recommendations of the accrediting body. Not only did the accreditation recommendations cause management to adjust and modify many practices, faculty and staff also used them to convince management and the Board of Trustees to adopt measures such as the establishment of the Office of Director of Standards and Professional Performance, Office of Advancement and Linkages, and Quality Assurance Management Center, creation of the College of Management, and vertical articulation of graduate school courses. According to Gillermo, Valdez, and Ferrer (2012), accreditation has improved organizational effectiveness through better planning and effective decision-making.

**Table 9: Impact of Accreditation in terms of School Leadership and Management**

| Category  | Mean (M)    | Description        |
|---|-------------|--------------------|
| Participation in the accreditation process has improved organization, management and long-term planning of my institution.              | 3.42        | High Impact        |
| The accreditation process has led to improvements in institutional leadership.  | 3.28        | High Impact        |
| The accreditation helped us focus more productively on planning.  | 3.25        | High Impact        |
| Through accreditation, planning, implementing and evaluating processes become dynamic and continuous.                                   | 3.38        | High Impact        |
| Accreditation helped us developed a financial information system that demonstrate transparency and more efficient financial management. | 3.29        | High Impact        |
| <b>School Leadership and Management</b>   | <b>3.32</b> | <b>High Impact</b> |

The results revealed that the accreditation process helped effectively use resources (M= 3.44) to provide adequate instructional materials and support facilities to continue improve and expand its programs and services. Accreditation teams’ recommendations were used to justify institution’s request on the procurement of school resources including technology, multi-media, and library resources. Institution’s requests are taken more seriously and prompt immediate action because recommendations came from an unbiased, knowledgeable, and independent group. This further conforms with the results of regional accreditation and quality of education survey, respondents indicated that the accreditation process is important in terms of improving the quality of school resources and supplies (NEASC, 2006).

The result agrees with the findings of Nguyen and Ta (2018) that accreditation influences most of the university's management activities, including programs, teaching activities, lecturers, supporting staff, learners and facilities.

**Table 10: Impact of Accreditation in terms of Use of Resources**

| Category   | Mean (M)    | Description        |
|--|-------------|--------------------|
| Accreditation has led my institution to diversify its income and utilize them in priority projects.  | 3.37        | High Impact        |
| Through accreditation, my institution has effectively focused its resources to continue improving and expanding its programs and services. | 3.48        | High Impact        |
| Participation in the accreditation process has improved the use and allocation of resources at my institution.                             | 3.41        | High Impact        |
| Participation in accreditation process improved the quality of school resources including technology, multi-media, and library resources.  | 3.43        | High Impact        |
| Accreditation has steered the school to provide adequate instructional materials and support facilities                                    | 3.51        | High Impact        |
| <b>Use of Resources</b>  | <b>3.44</b> | <b>High Impact</b> |

## CONCLUSIONS

In the light of the findings, the following conclusions were arrived at:

Faculty members and the administration of ISCOF have exerted their best effort to highly practice most of the processes to attain higher levels of accreditation.

Accreditation evaluates the availability, adequacy and effectiveness of support facilities and laboratories. Very serious problems encountered during accreditation visit are the inadequate physical facilities and unavailable laboratory equipment. Therefore, the administration has to give priority in the continuous improvement and upgrading of physical plant, facilities and laboratories because it determines the successful implementation of its curricular programs.

Accreditation had made high impact on the quality of education at the Iloilo State College of Fisheries. Accreditation had led to improvements in instruction, professional development, academic and work environment, staff communication and teamwork. It had also prompted effective planning and management and wise utilization of resources. It can be concluded that accreditation is one of the most important factors in ensuring continuous educational improvement and attaining quality and excellence.

## RECOMMENDATIONS

Based on findings and conclusions of this study, the researchers recommend the following:

Regular conduct of stakeholders meeting be done to involve them in the formulation, review and evaluation of programs' educational objectives. Templates may be developed to facilitate the collection, organization, and presentation of documents in the PPP and program assessment and evaluation system be established to continuously monitor and review the compliance of the programs with the standards.

The institution may secure government agency funding to support research scholarship grant among faculty and students. Additional budget be allocated for research fora and publication to provide them with a wide range of research opportunities. Research linkages and networks be formed with local and international research organizations and institutions for funding, sharing information on new approaches and resources and acquiring specialized and new expertise.

Members of accreditation task force may be given incentives to further encourage and motivate them to aim for higher levels of accreditation.

Periodic evaluation by internal and external accrediting agencies be conducted for feedbacking, constructive criticism and continuous improvement.

Improvement and upgrading of physical facilities and acquisition of state-of-the art laboratory equipment be given priority and attention by the administration to meet standard requirements prescribed by the regulatory agencies.

Additional budget may be allocated for the improvement of physical facilities such as buildings, classrooms, clinic, canteen, rest rooms and student centers, provision of appropriate laboratory apparatus, equipment, and other school facilities.

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# COMPETENCIES OF BUSINESS ADMINISTRATION STUDENTS IN THE PREPARATION OF FINANCIAL STATEMENTS

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## ABSTRACT

Business degree programs include basic accounting courses as they are considered the core function of any business. Accounting requires sound analytical and logical reasoning more than math skills - making it as one of the subjects that students find trouble with. Competent and fully-equipped professionals are in extremely high demand across diverse sectors because companies of all types are scrutinized with regard to their financial activities. This paper assessed the competencies of business administration students in terms of their knowledge and skills on classification of accounts, analyzing and recording of transactions, and preparation of financial statements and their readiness in preparing a feasibility study as a greater part of the paper deals with financial projections. The respondents were third year BS Business Administration (BSBA) students who were selected through purposive sampling. Three simulation tests were administered: (1) classification of accounts into assets, liabilities, equity, income and expenses; (2) journalizing, posting and trial balance preparation; and (3) preparation of financial statements. Interviews and focus group discussions were also conducted to validate the results. The criteria used were accuracy, face validity and their aptitude level on accounting. Findings revealed that the student-respondents whose knowledge in accounting were inadequate and were not equipped to prepare financial reports. It is recommended that series of seminars are needed to acquaint them with the tedious preparation of financial reports. Further, a review on the current curriculum is necessary because two basic accounting subjects may not be sufficient for students to be competent in the industry.

*Keywords: competencies, business administration, accounting, financial statements, financial reports*

## INTRODUCTION

Business administration (BA) students are faced with challenges as knock-on effect of globalization and borderless education. Getting a college degree has become a staple in our society but apparently, the trend is shifting. A diploma is not a VIP pass to well-paid jobs. As stated by Agrawal (2015) in his article, one of the struggles post-grads faces includes job availability. The job market is tough, and for graduates without succinct or planned out career approach, finding a job can be especially difficult. In addition, graduates who did not have the skills required by the employers might end up with job mismatch.

According to Commission on Higher Education Memorandum Order No. 17 series of 2017, business administration graduates should be able to prepare comprehensive strategic business and operational plans that require accounting education. Also, Celik & Ecer, (2009) emphasized that it is important to see efficiency of accounting education in order to fully understand the operational environment of companies.

Okpan (2006) had identified some of the accounting skills that are required in business education graduates and these are: to keep accurate financial records, understand ways of recording business transactions, to be acquainted with current trends in accounting, to manage various books of accounts, and interpret financial reports. Likewise, Hooks (2013) has identified that finance and accounting are two areas that seems to be a challenging in honing the bread-and-butter skills of a business leader.

In a survey conducted by Graduate Management Admission Council in 2016, 51% of the business school alumni said that financial skills are essential in their current job similar to the outcome developed by Find University (2019) from the testimonials of some BA graduates of different schools in the Philippines as they shared that personal attributes toward work and their learning from business correspondence, strategic management, total quality management, business plan preparation, and basic accounting knowledge are useful in their current jobs like corporate planning management trainee, financial analyst, licensed real estate broker, sales and marketing assistants.

Several recent studies on employers pointed out that soft skills and some hard skills are in high demand for graduates but in a short supply. Bloomberg Research (2015) identified analytic thinking, creative problem solving and quantitative skills as some of the hard skills that more than 600 companies are looking for. Also, the U.S. -based National Association of Colleges and Employers (NACE) in 2018 pointed that problem solving (80.90%) and analytical or quantitative skills (67.50%) are some of the attributes fresh college graduate applicants must possess.

The literature and studies reviewed above agreed that business administration graduates must be equipped with distinctive skills and expertise in accounting to perform their jobs excellently and to be the most sought-after by employers. With this, educational institutions must ensure that their graduates possess the competencies that complements the high-paced advancement of business industry. These competencies will be relevant to the work readiness of the graduates as well as in becoming potential entrepreneurs.

## STATEMENT OF OBJECTIVES

Nueva Ecija University of Science and Technology (NEUST) is relevant and responsive with the needs of the society by producing high-merit graduates that conforms to the standards set by the Philippine education system. To ensure that the quality statement of the University is achieved, there is a need to:

1. assess the competencies of business administration students in terms of their knowledge and skills on:
  - 1.1 classification of accounts,
  - 1.2 analyzation and recording of transactions, and
  - 1.3 preparation of financial statements.
2. to propose interventions according to the outcomes of the evaluation.

## METHODOLOGY

### Data Collection

The respondents are BS Business Administration (BSBA) students in third year level of Nueva Ecija University of Science and Technology that will take up Feasibility Study (FS) as part of their academic requirements. The nonprobability sampling, specifically purposive, was used to gather data from the respondents. With the total population of 183, 121 students were identified as respondents based on their availability and willingness to participate in the research.

In order to gather data needed for the study, three simulation tests were administered: (1) classification of accounts into assets, liabilities, equity, income and expenses; (2) journalizing, posting and preparation of trial balance; and (3) preparation of basic financial statements. Interviews and focus group discussions were conducted to the respondents to validate the test results.

### Measures and Variables

Students undergone three (3) simulation tests to determine their competencies in the basic steps in financial statements preparation.

The first test comprised of fifty account titles that they need to accurately classify into five basic elements: asset, liabilities, capital, income and expenses. Table 1 shows the range values for four-point



Likert scale for classification of accounts. The respondents must get at least a score of 38 to get satisfactory remark.

**Table 1. Four-point Likert Scale for Accuracy Criterion**

| Rating            | Scale            |
|-------------------|------------------|
| Outstanding       | 91.67% - 100%    |
| Very Satisfactory | 83.34% - 91.66%  |
| Satisfactory      | 75 - 83.33%      |
| Needs Improvement | 74.99% and below |

The second part requires journalizing, posting and preparation of trial balance of one-month transactions of a certain company. The criteria used to evaluate the test results were accuracy, face validity and aptitude. Accuracy pertains to the correctness of the account titles used and amounts recorded. It is rated as outstanding, very satisfactory, satisfactory, and needs improvement based on the transmuted scores as shown in Table 1. Face validity involves proper sequence, proper indention, proper labelling and presentation of transactions. Aptitude refers to the capability of the respondents to determine whether the transactions should be recorded or not and the extent of completion of the required task.

The last part consists of the preparation of basic financial statements: income statement, statement of changes in equity and balance sheet. The criteria for this test were the same as the second part except for the composition of face validity and aptitude. Face validity includes the proper placing of accounts, sequence of presentation, completeness of information and compliance to required minimum structure of financial statements. The ability to construct each part of the financial statements is measured in the aptitude criterion.

## FINDINGS

### Classification of Accounts

It is crucial that one should have an expertise in classifying account titles in the creation of financial statements. The main purpose of these reports will not be achieved if some characteristics like reliability, relevance, comparability and verifiability are affected due to misclassification of accounts.

Based on the results depicted in Table 2, twenty-point forty-one percent (20.41%) got 75% and above in Test I. According to the students, they failed to recall the classification of most of the account titles and some are not familiar to them.

**Table 2. Results of Test I**

| Rating            | Frequency | Percentage    |
|-------------------|-----------|---------------|
| Outstanding       | 0         | 0             |
| Very satisfactory | 6         | 6.12%         |
| Satisfactory      | 14        | 14.29%        |
| Needs improvement | 78        | 79.59%        |
| <b>TOTAL</b>      | <b>98</b> | <b>100.0%</b> |

### Journalizing, Posting and Trial Balance

Financial reports are crafted from the journal entries and ledger accounts; thus, it is vital that bookkeepers and compilers have tremendous competency in journalizing and posting of transactions as well as the conception of trial balance.

**Table 3. Results of Test II**

| Criteria                                | Frequency  | Percentage     |
|---|------------|----------------|
| <b>Accuracy</b>                         |            |                |
| Outstanding                             | 14         | 11.57%         |
| Very satisfactory                       | 7          | 5.79%          |
| Satisfactory                            | 0          | 0.00%          |
| Needs improvement                       | 100        | 82.64%         |
| <b>Total</b>                            | <b>121</b> | <b>100.00%</b> |
| <b>Face validity</b>                    |            |                |
| Proper sequence                         | 55         | 45.45%         |
| Proper indention                        | 84         | 69.42%         |
| Proper labelling                        | 47         | 38.84%         |
| Compliance to presentation requirements | 77         | 63.64%         |
| <b>Aptitude</b>                         |            |                |
| Trial balance                           | 30         | 24.79%         |
| Posting                                 | 51         | 42.15%         |
| Journal entries                         | 101        | 83.47%         |
| Recognition of events                   | 97         | 80.17%         |

Based on Table 3, it is observed that most of them know how to recognize events (80.17%) and how to journalize transactions (83.47%). However, 57.85% failed to post the transactions and 75.21% did not finish preparing the trial balance or it is unbalanced.

Some respondents mentioned after the examination that they commonly known the term “post” as “T-accounts” but they insisted that they know how to do it and some did not pay attention in finishing this part.

With further analysis, it is discovered that the primary reasons of partial or non-preparation of trial balance is inaccuracy and improper labelling of accounts.

It is also apparent from the queries of the students that they have a problem with English proficiency and comprehension. Some students also commented that they do not know how to analyze and compute the given events.

### **Preparation of Financial Statements**

The results show that the students have the capability to prepare income statement (72.73%) and balance sheet (93.39%) but not statement of changes in equity (33.06%). However, only 6.61% accurately do it and 75.21% needs improvement. They failed to balance the assets, liabilities, and equity.

Based from the Table 4, the researchers determined the common reasons of inaccurate financial statements were: (1) improper placing of accounts (91.7%); (2) sequence of account presentation (70.20%); and (3) incomplete presentation of financial information (66.9%).

An open conversation with some students revealed that they had difficulty in financial statements preparation because they are not typically inclined in numbers, they did not see the relevance of the subject to their future careers, and too many concepts that are difficult to comprehend resulting to confusion and information overload.

| Criteria                                | Frequency  | Percentage     |
|---|------------|----------------|
| <b>Accuracy</b>                         |            |                |
| Outstanding                             | 8          | 6.61%          |
| Very Satisfactory                       | 9          | 7.44%          |
| Satisfactory                            | 13         | 10.74%         |
| Needs Improvement                       | 91         | 75.21%         |
| <b>TOTAL</b>                            | <b>121</b> | <b>100.00%</b> |
| <b>Face validity</b>                    |            |                |
| Proper Placing of Accounts              | 10         | 8.26%          |
| Sequence of Presentation                | 36         | 29.75%         |
| Completeness of Information             | 40         | 33.06%         |
| Compliance to Presentation Requirements | 121        | 100.00%        |
| <b>Aptitude</b>                         |            |                |
| Balance Sheet                           | 113        | 93.39%         |
| Changes in Equity                       | 40         | 33.06%         |
| Income Statement                        | 88         | 72.73%         |

## CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of this study, the following conclusions and recommendations were drawn and suggested:

### Conclusions

1. Third (3rd) year BSBA students have the basic knowledge in the preparation of financial statements, however, they lack the competencies in classifying and proper placing of accounts in the income statement, statement of changes in equity and balance sheet.
2. The students are still incapacitated and are not fully equipped in making the financial reports.

### Recommendations

1. It is highly recommended that they undergo series of workshops is needed to acquaint them with the tedious preparation of a financial report. These workshops should be administered before actual creation of their feasibility studies and before their on-the-job trainings.
2. Further, a review on the current curriculum is necessary because two basic accounting subjects may not be sufficient for students to be competent in the industry.

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# DEVELOPMENT AND ACCEPTABILITY OF A PIJANGA FISH CRACKERS

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## ABSTRACT

This study aimed to develop pijanga fish crackers and determined its level of acceptability. Hence, proper proportions on the amount of the ingredients were determined in order to come up with a desirable taste of this particular food product. Both quantitative and qualitative approaches were employed in this study. Consumer-respondents and food experts were able to assess the qualitative aspects of this research by using the qualitative scale for food tasting. Moreover, statistical tools such as mean, standard deviation were used to determine the acceptability of the product based on the qualitative preferences (appearance, aroma, taste, and texture) of the food experts/consumers of the four variants of pijanga crackers. Mean difference and Analysis of Variance (ANOVA) were also used to determine the differences of the crackers at different amount of pijanga as main ingredients. Result revealed that adding an amount of 100 grams of pijanga, an increase of 10% in the mixture, 20% increase for 200 grams, 30% for 300 grams and 40% increase when adding 400 grams. Also when adding certain amount of other ingredients changes the appearance, taste, aroma and texture of the product. The acceptability of the product as to appearance was rated Acceptable for variants 1 and 2 while variants 3 and 4 were rated as Much acceptable. It was found out that the participants have different observation in different mixtures. In the sensory evaluation only the appearance and the taste had shown the significant difference as  $\alpha < 0.05$ , thus suggested the rejection of the null hypothesis. Phytochemical analysis reveal that no detection was found on its moisture and mineral content, however, the product is safe to eat.

*Keywords: Fish Crackers, Pijanga Cracker, Acceptability, Perceptions*

## INTRODUCTION

Crackers are widely consumed snack foods and there is an increasing trend in adding functional ingredients to their composition. The world snack food market has been projected to reach USD 639 billion by 2023, growing at a compound annual growth rate (CAGR) of 5.8% from 2018 to 2023 (Mordor, 2017). In recent years, a major market trend has been the introduction of new products containing health-promoting ingredients associated with a growing demand for healthy snacks due to the consumer mind set changing taste and preference. In particular, savory snacks, namely, salted crackers, are growing at a greater rate than sweet snacks (Technavio, 2017). Crackers are considered popular snack products which have appreciable demand amongst consumers. Crackers are generally defined as dry, thin, and crisp bakery products usually made of wheat flour, fat (or shortening), salt, and leavening agents (yeast, chemical leaveners, or a combination of both).

This research focuses on food innovation, primarily fish crackers (kropek), with the goal of demonstrating how *Glossogobius giuris* (pijanga) can be a very effective and practical main ingredient for fish crackers. People from many walks of life struggle to make ends meet by relying on the environment's available resources. They engage in various sorts of agriculture and industrial activity to meet their basic economic needs.

Productivity improvement is one of the Philippines' economic priorities. The financial position of residents in various rural villages across the country is affected by fish processing. By leveraging what is available in the local environment, a profitable business can help support the family's daily needs. Every household is tasked with creating high-quality cooking using nutritious ingredients. The demand for high-quality meals rises as people become more financially secure and health-conscious, while the availability of limited resources determines the state of supply inadequacy.

The researcher were create a fish cracker (kropek) with a big amount of *Glossogobius giuris* (pijanga) as the main ingredient due to the fish's availability in the area, its practical application due to its lower price than most fish, and its anticipated flavor, especially when fried. This opportunity to boost kropek manufacturing, as well as the finding of an abundant source of fish crackers, is anticipated by the researcher. Local fisherman, kropek producers and sellers, and small enterprises would benefit immensely from the findings of this study in terms of improving their lives through this food innovation.

## STATEMENT OF THE PROBLEM

This study aimed to develop a fish cracker with *Glossogobius giuris* (pijanga) as the main ingredient.

Specifically, it sought to answer the following questions:

1. What is the amount of large *Glossogobius giuris* (pijanga) to be used in developing the fish cracker in terms of:
  - 1.1 100 grams;
  - 1.2 200 grams;
  - 1.3 300 grams; and
  - 1.4 400 grams?
2. To what extent do the respondents assess the level of acceptability of the product as to:
  - 2.1 appearance;
  - 2.2 aroma;
  - 2.3 taste/flavor; and
  - 2.4 texture?
3. What is the potential of the new food innovation in terms of being significantly more cost-friendly than other kropek versions?
4. What is the phytochemical analysis of the product?

## METHODOLOGY

### Research Design

The study utilized the descriptive-developmental design since this study developed a food product with *Glossogobius giuris* (pijanga) as the key and main ingredient in the development of a fish cracker. The qualitative approach was also used in the study to determine the acceptability of the product in terms of appearance, scent, taste, and texture.

### Research Environment

The study was conducted at ABS-CBN Lingkod Kapamilya BPP Laboratory of Surigao City National High School. It is a secondary high school in the CARAGA Region of the Philippines with approximately 2,000 students enrolled in both junior and senior high schools. The institution also offers K to 12 junior high school program, and senior high school program that offers General Academic Strands (GAS), Technical Vocational and Livelihood (TVL) specifically the Shielded Metal Arc Welding, Food and Beverage Services, Cookery, and Bread & Pastry Production.

### Respondents

This study considered the 45 faculty of Foods Technology Teachers, Food Entrepreneurs and the Food Consumers as participants especially in determining the acceptability of the fish cracker product.

**Table 1. Distribution of respondents**

| Respondents               | f         | Percent     |
|---------------------------|-----------|-------------|
| Foods Technology Teachers | 10        | 22.22%      |
| Food Entrepreneurs        | 11        | 24.44%      |
| Food Consumers            | 24        | 53.34%      |
| <b>Total</b>              | <b>45</b> | <b>100%</b> |

### Research Instrument

This research is solely focused on product development. However, to establish the product's level of acceptance, a researcher-created questionnaire was used, specifically in determining the product's acceptability in terms of appearance, scent, taste/texture, and texture..

### Data Analysis

This study utilized the following statistical tools in analyzing the data:

**Percent.** This tool was used to determine the amount of *Glossogobius giuris* (*pijanga*) in each mixture.

**Mean and Standard Deviation.** These tools were used to determine the acceptability of the dynamite scone using the perceived qualitative descriptions as used in the instrument (appearance, aroma, taste, and texture).

**Turkey Honest Significant Difference Test.** This tool was used to determine the difference for the Appearance and the Taste.

## RESULTS AND DISCUSSIONS

Amount of large *Glossogobius giuris* (*pijanga*) used in Developing the Fish Cracker and Its Level of Acceptability

Table 1 presents the level of acceptability of the (*pijanga*) fish cracker as a product with respect to its appearance.

**Table 1. Level of Acceptability of the (*pijanga*) fish cracker as a product with respect to Appearance**

| Appearance                                    | 100 grams   |          | 200 grams   |          | 300 grams   |           | 400 grams   |           |
|---|-------------|----------|-------------|----------|-------------|-----------|-------------|-----------|
|   | Mean        | QD       | Mean        | QD       | Mean        | QD        | Mean        | QD        |
| 1. Color of the fish cracker                  | 3.18        | A        | 3.31        | MA       | 3.69        | MA        | 3.71        | MA        |
| 2. Size of the fish cracker                   | 2.80        | A        | 3.18        | A        | 3.47        | MA        | 3.33        | MA        |
| 3. Shape of the fish cracker                  | 3.04        | A        | 3.27        | MA       | 3.31        | MA        | 3.49        | MA        |
| 4. Transparency and gloss of the fish cracker | 3.13        | A        | 3.13        | A        | 3.56        | MA        | 3.44        | MA        |
| 5. Wholeness of the fish cracker              | 3.24        | A        | 3.31        | MA       | 3.40        | MA        | 3.42        | MA        |
| <b>Average Mean</b>                           | <b>3.08</b> | <b>A</b> | <b>3.24</b> | <b>A</b> | <b>3.49</b> | <b>MA</b> | <b>3.48</b> | <b>MA</b> |

#### Rating Scale Descriptive Equivalent

|             |                    |
|-------------|--------------------|
| 3.26 – 4.00 | Much Accepted (MA) |
| 2.51 – 3.25 | Accepted (A)       |
| 1.76 – 2.50 | Less Accepted (LA) |
| 1.00 – 1.75 | Not Accepted (NA)  |

The Table reveals the level of acceptability of the (*pijanga*) fish cracker as a product with respect to appearance. It can be seen that in the 300grams and 400 grams mixture, most of the observation of the participants falls within the rating scale of 3.26-4.00, thus, obtained the description of Much Accepted. While with respect to the 200g grams mixture of (*pijanga*) fish cracker, the statement 2 and statement 4 were rated Accepted, having a mean of 3.18 and 3.13, respectively. But still, these responses imply a satisfied standard as evaluated by the participants in every statement given. In addition, the 100 grams mixture of (*pijanga*) fish cracker having an average mean of 3.078 was rated also as Accepted.

The finding on appearance variable which is generally rated as much accepted is in consonance with the idea of Butchings (n.d) who generally emphasized that the impression of a food is usually visual.

And the major part of ones willingness to accept a food depends on its appearance. Appearance is a compound of all the information about the product and its environment which reaches the eye.

Table 2 reveals the level of acceptability of the (*pijanga*) fish cracker as a product with respect to aroma.

It can be seen that most of the observation of the participants falls within the rating scale of 3.26-4.00 with respect to the 200g, 300g and 400 grams mixture of (*pijanga*) fish cracker.

**Table 2. Level of Acceptability of the (*pijanga*) fish cracker as a product with respect to Aroma**

| Aroma                                   | 100 grams   |          | 200 grams  |           | 300grams     |           | 400 grams    |           |
|---|-------------|----------|------------|-----------|--------------|-----------|--------------|-----------|
|   | Mean        | QD       | Mean       | QD        | Mean         | QD        | Mean         | QD        |
| 1. Balance of aroma in all ingredients. | 3.00        | A        | 3.53       | MA        | 3.44         | MA        | 3.38         | MA        |
| 2. Aroma from the <i>pijanga</i>        | 2.84        | A        | 3.31       | MA        | 3.36         | MA        | 3.53         | MA        |
| 3. Aroma whets appetite.                | 2.89        | A        | 3.47       | MA        | 3.44         | MA        | 3.44         | MA        |
| 4. Aroma heightens marketability.       | 3.13        | A        | 3.38       | MA        | 3.33         | MA        | 3.44         | MA        |
| 5. Aroma enhances flavor.               | 3.04        | A        | 3.31       | MA        | 3.49         | MA        | 3.27         | MA        |
| <b>Average Mean</b>                     | <b>2.98</b> | <b>A</b> | <b>3.4</b> | <b>MA</b> | <b>3.412</b> | <b>MA</b> | <b>3.412</b> | <b>MA</b> |

| Rating Scale | Descriptive Equivalent |
|--------------|------------------------|
| 3.26 – 4.00  | Much Accepted (MA)     |
| 2.51 – 3.25  | Accepted (A)           |
| 1.76 – 2.50  | Less Accepted (LA)     |
| 1.00 – 1.75  | Not Accepted (NA)      |

These responses denote that it satisfies the standards of the participants in all the statements given in the Table. Thus, all are qualitatively described as Much Accepted. On the other hand, in the mixture of 100 grams, having the computed means of 3.00, 2.84, 2.89, 3.13, and 3.04, respectively from statements 1 to 5 resulted a computed average mean of 2.98 which described only as Accepted. The flavor modality, which can comprise of both aroma or taste has been shown to enhance the sensation of fullness, suppress hunger sensation and reduce food intake (Bolhuis et al., 2011, Ramaekers et al., 2011). There is an increasing interest in the impact of aroma and odour on appetite sensation and food intake.

Table 3 presents the level of acceptability of the (*pijanga*) fish cracker as a product with respect to Taste/Flavor.

**Table 3. Level of Acceptability of the (*pijanga*) fish cracker as a product with respect to Taste/Flavor**

| Taste/Flavor                                    | 100 grams   |          | 200 grams   |           | 300grams    |           | 400 grams   |           |
|---|-------------|----------|-------------|-----------|-------------|-----------|-------------|-----------|
|   | Mean        | QD       | Mean        | QD        | Mean        | QD        | Mean        | QD        |
| 1.Saltiness of the fish cracker.                | 2.96        | A        | 3.36        | MA        | 3.33        | MA        | 3.31        | MA        |
| 2. Balance of the flavor.                       | 3.09        | A        | 3.33        | MA        | 3.42        | MA        | 3.36        | MA        |
| 3.Distinction of <i>Pijanga</i> 's flavor.      | 3.02        | A        | 3.31        | MA        | 3.53        | MA        | 3.49        | MA        |
| 4.Flavor increases appetite to eat more.        | 3.24        | A        | 3.36        | MA        | 3.42        | MA        | 3.29        | MA        |
| 5.Flavor's overall acceptability in the market. | 3.11        | A        | 3.47        | MA        | 3.31        | MA        | 2.91        | A         |
| <b>Average Mean</b>                             | <b>3.09</b> | <b>A</b> | <b>3.37</b> | <b>MA</b> | <b>3.40</b> | <b>MA</b> | <b>3.27</b> | <b>MA</b> |

| Rating Scale | Descriptive Equivalent |
|--------------|------------------------|
| 3.26 – 4.00  | Much Accepted (MA)     |
| 2.51 – 3.25  | Accepted (A)           |
| 1.76 – 2.50  | Less Accepted (LA)     |
| 1.00 – 1.75  | Not Accepted (NA)      |

It can be gleaned from the Table that in the 200 grams and 300 grams mixture were rated much accepted, as all the statement falls within the rating scale of 3.26-4.00. while in the 400 grams mixture, the statement 5 with a computed mean of 2.91 was rated as accepted only. In addition, the 100 grams mixture having all the statement and with a computed average mean of 3.084 were also rated as accepted. This signifies that the perception of the participants according to their observation of the product with respect to taste or flavor is still satisfactory. Flavors can help to keep food pleasurable like the crackers, with a truly authentic taste and without any off-notes. The same reasoning applies in developing healthier products. There is a huge demand for products with less fat, less sugar, less salt, more fibre or more protein.



Table 4 shows the computed mean for acceptability of the participants of the different concentration of *pijanga* fish crackers in terms of texture.

The Table reveals an Accepted evaluation of the participants with respect to 100g concentration, as most of their responses fell within the rating scale of 2.50–3.24. Although they have slightly different responses in the mixture of 300grams and 400 grams, still it was rated as Much Accepted having a computed average mean of 3.36 and 3.386, respectively.

**Table 4. Level of Acceptability of the (*pijanga*) fish cracker as a product with respect to Texture**

| Texture                                 | 100 grams    |          | 200 grams   |          | 300grams    |           | 400grams    |           |
|---|--------------|----------|-------------|----------|-------------|-----------|-------------|-----------|
|   | Mean         | QD       | Mean        | QD       | Mean        | QD        | Mean        | QD        |
| 1.Crispiness of the fish cracker.       | 3.04         | A        | 3.56        | MA       | 3.62        | MA        | 3.58        | MA        |
| 2.Hardness of the fish cracker.         | 2.78         | A        | 3.00        | A        | 3.29        | MA        | 3.29        | MA        |
| 3.Moisture content of the fish cracker. | 2.84         | A        | 3.04        | A        | 3.04        | A         | 3.31        | MA        |
| 4.Chewiness of Fish cracker             | 2.78         | A        | 3.22        | A        | 3.09        | A         | 3.22        | A         |
| 5.Mouthfeel texture of fish cracker.    | 3.00         | A        | 3.27        | MA       | 3.76        | MA        | 3.53        | MA        |
| <b>Average Mean</b>                     | <b>2.888</b> | <b>A</b> | <b>3.22</b> | <b>A</b> | <b>3.36</b> | <b>MA</b> | <b>3.39</b> | <b>MA</b> |

**Rating Scale      Descriptive Equivalent**

3.26 – 4.00      Much Accepted (MA)  
 2.51 – 3.25      Accepted (A)  
 1.76 – 2.50      Less Accepted (LA)  
 1.00 – 1.75      Not Accepted (NA)

Texture is important in determining the eating quality of foods and can have a strong influence on food intake and nutrition. Perceived texture is closely related to the structure and composition of the food, and both microscopic and macroscopic levels of structure can influence texture. According to Chen (2015), food texture is a collective term of sensory experiences originated from visual, audio and tactile stimuli. The sensation of food texture plays a crucial role in influencing consumers’ liking and preference of a food product. Consumer concern and interest of food texture vary from one type of food to another. For solid foods, sensory experience associated with fracture and breaking could be the most relevant textural features, whereas the sensation of flow behavior could be the most critical texture-related feature for fluid foods. For semisolid or soft solid foods, different patterns of stress–strain deformation provide key information for the delicate texture variation among this type of food.

Table 5 presents the summary of level of acceptability of the (*pijanga*) fish cracker with respect to appearance, aroma, taste and flavour, and the texture.

**Table 5. Summary of level of acceptability of the (*pijanga*) fish cracker with respect to Appearance, Aroma, Taste and Flavor, and the Texture**

| Acceptability     | 100 grams    |          | 200 grams   |           | 300grams     |           | 400grams     |           |
|-------------------|--------------|----------|-------------|-----------|--------------|-----------|--------------|-----------|
|                   | Mean         | QD       | Mean        | QD        | Mean         | QD        | Mean         | QD        |
| Appearance        | 3.078        | A        | 3.24        | A         | 3.486        | MA        | 3.478        | MA        |
| Aroma             | 2.98         | A        | 3.4         | MA        | 3.412        | MA        | 3.412        | MA        |
| Taste and Flavor  | 3.084        | A        | 3.37        | MA        | 3.402        | MA        | 3.272        | MA        |
| Texture           | 2.888        | A        | 3.22        | A         | 3.36         | MA        | 3.386        | MA        |
| <b>Grand Mean</b> | <b>3.006</b> | <b>A</b> | <b>3.30</b> | <b>MA</b> | <b>3.484</b> | <b>MA</b> | <b>3.416</b> | <b>MA</b> |

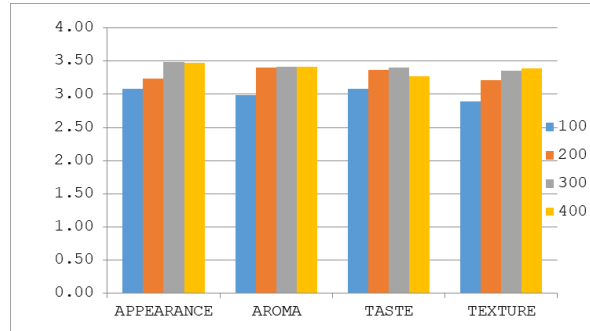
**Rating Scale      Descriptive Equivalent**

3.26 – 4.00      Much Accepted (MA)  
 2.51 – 3.25      Accepted (A)  
 1.76 – 2.50      Less Accepted (LA)  
 1.00 – 1.75      Not Accepted (NA)

The Table shows the summary of level of acceptability of the (*pijanga*) fish cracker with respect to Appearance, Aroma, Taste and Flavor, and the Texture. It shows that only the 300grams and 400 grams’ mixture were rated as “much accepted” This means that they still have a need of satisfaction to accept the *pijanga* crackers in terms of appearance, texture, aroma, and the taste of the fish crackers with respect to the 100 grams and 200 grams mixture.

Figure 2 presents the bar graph of mean responses and the level of acceptability of the (*pijanga*) fish cracker with respect to appearance, aroma, taste and flavor, and the texture.


**Figure 2. Bar graph of mean responses and the level of acceptability of the (*pijanga*) fish cracker with respect to Appearance, Aroma, Taste and Flavor, and the Texture**



It can be gleaned from the Graph that the 300 grams and 400 grams mixture were the most favored mixture in terms of the responses of the participants with respect to appearance, aroma, taste and flavor, and the texture.

**Phytochemical Test**

**Report**



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Rev. No. 0 / Issue No. 1

**TEST REPORT**

**CLIENT:** Aluha D. Zhang  
**ADDRESS:** Brgy. Luna, Malico St. Mari Apartment Residential  
 Surigao City, Surigao del Norte


**CONTROL NO.:** 22-16245  
**DATE RECEIVED:** 21-Mar-22  
**DATE ANALYZED:** 21 Mar 06 Apr-22  
**DATE REPORTED:** 06-Apr-22


**SAMPLE INFORMATION**  
 Sample Name: Food (01)  
 Description: Food  
 Packaging: Contained in a ziplock.

| Lab. Ref. No.          | Description                                | PARAMETER             |
|------------------------|--|-----------------------|
|                        |  | <b>Mercury</b><br>ppb |
| F <sub>1</sub> -22-252 | Glossogobius Gutturis (Pijanga)<br>Cracker | ND                    |

Method: Cold Vapor - AAS  
 \*\*\* Nothing Follows \*\*\*

**REMARKS:** 1. Result(s) is/are based on sample(s) submitted to DALINC unless otherwise indicated. The Laboratory does not guarantee that the sample(s) is/are representative of the whole bulk from where it was/were drawn.  
 2. Method(s) used is/are in accordance with the Official Methods of Analysis of AOAC Int'l, 17th edition.  
 3. ND = Not Detected.  
 4. This test report may not be reproduced unless in full.

Analyzed by:   
**Farrah Ketzi Cabudoy**  
 Junior Analyst  
 PRC No.: 0003368 / PTR No.: 5920773

Certified by:   
**June Ann Adrienne Teh Bonilla, RCh**  
 Laboratory Manager  
 PRC No.: 0010282 / PTR No.: 5920766

D:\TEST RESULT\2022\Foods\RFA 22-16245 Hg Page 1 of 1

After considering the four (4) variants of mixtures of the fish crackers as a product of this developmental study, the Variant 1 that is labeled as Standard Met was submitted to Davao Analytical Laborato-

## CONCLUSIONS

Results demonstrated the viability of producing different mixtures in preparing pijanga crackers. Adding different amount of ingredients will increase the amount of the regular mixture thus, affect its appearance, aroma, taste and texture but there is only one mixture the variant 1 that the participants rated acceptable, the mixture of 10% or 100 grams of pijanga.

Although the three (3) variants of mixtures were much acceptable from the ratings of the participants but variant 1 mixture was very consistent rating of acceptable based on the sensory evaluation of the raters.

## RECOMMENDATIONS

1. An alternative preservation and packaging for the product.
2. A research that focuses on the stability of pijanga crackers made using this preferred formulation and the improved processing method is necessary to prolong the shelf life.
3. Further analysis on the other chemical and physical characteristics of pijanga crackers may be conducted.
4. Utilize the developed crackers in other Filipino snack crackers to examine its efficacy and applicability to other snack foods.
5. The product should be submitted to the intellectual property of the Philippines for registration and IP protection.

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# DEVELOPMENT AND ACCEPTABILITY OF A GIANT TARO FLOUR ENRICHED WITH SALUYOT POWDERED KROPEK CHIPS

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## ABSTRACT

This study aimed to develop Giant Taro Flour Enriched with Saluyot Powdered kropek with different concentrations. Hence, proper proportions of the amount of the ingredients were determined in order to come up with a desirable taste for this particular kropek food. Developmental-descriptive design were used in the study. Consumer respondents and food experts were able to assess the qualitative aspects of this research by using the qualitative scale for food tasting. Moreover, statistical tools such as mean, and standard deviation were used to determine the acceptability of the kropek based on its appearance, aroma, crunchiness, flavor/taste, and texture. Mean difference and Analysis of Variance (ANOVA) were also used to determine the differences of the kropek enriched different concentrations of saluyot powder. Phytochemical analysis was also determined. Result revealed that the product with a mixture of 45 grams of saluyot powder and 250 grams of giant swamp taro flour showed to be gratifying to the participants in terms of its appearance, aroma, crunchiness, flavor, and texture. It was found that an increase of enhancers (saluyot powder) has a significant effect on the appearance, aroma, crunchiness, flavor, and texture of the mixture, thus, the finished product became less acceptable to not acceptable among the different groups of participants. As to the acceptability level of the product, the appearance (M=4.39), and flavor/taste (M=4.26) are described as Very Acceptable. While aroma (M=3.75) and crunchiness (M=4.07) are described as Acceptable. The giant swamp taro flour kropek chip enriched with saluyot has high in calories (483.2) which indication of abundant carbohydrates.

*Keywords: Giant Taro Flour, Saluyot Powder, Acceptability, Perceptions*

## INTRODUCTION

Food scarcity in the past is now being felt by the community as a result of the current situation, the COVID-19 Pandemic, in which everyone is affected by a lack of food in town. Especially for the island towns, where the travel of essential and basic food was hampered to be delivered on time in the town due to policy restrictions, health protocols, and limited voyages from the city to the island's town to avoid the spread of the disease.

The government encouraged people and local government officials to produce local products to sustain people from their daily needs and to have a stable supply of food for the locality to survive independently, with less reliance on imports of goods from outside the town. This provides people with a source of income by producing locally produced goods and promoting them through tourism and other government programs and activities. *Cyrtoperma chamissonis*, or Giant Swamp Taro, is a native plant of the Philippines with dozens of varieties that thrive on most tropical islands (Hopkins, 2012). Saluyot/jute leaf (*Corchorus olitorius*) is a leafy vegetable popular in Southeast Asia. It is high in iron, vitamins B, C, and calcium. According to the Medical Health Guide, medical applications include treating gestational diabetes in pregnant women (2011). As a result, it is a medicinal edible vegetable plant.

Kropek is a traditional dried crispy food product popular in South-East Asian countries, particularly Indonesia and Malaysia, with significant economic potential. Kropek chips are now a popular comfort food in many households as a result. This is an easy recipe that anyone can make.

The researcher's goal in this study is to create a giant swamp taro kropek chips enriched with saluyot powder. As a result, proper proportions of the ingredients are determined to produce a desirable recipe for this new innovative product. Furthermore, there was no data-based evidence on the production and development of this new innovative product in Loreto, Dinagat Islands, and other countries.

The goal of this study is to create a product made from Giant Taro flour and enriched saluyot powder. This product adds more innovation by using giant swamp taro flour and saluyot plants as a purposeful vegetable medicinal plant as an acceptable additive and ingredient to other products.

## STATEMENT OF THE PROBLEM

The study aimed to develop kropek chips made out of giant swamp taro enriched with saluyot.

It specifically sought solutions to the following sub-problems:

1. What is the assessment of the respondents in terms of different concentrations/mixtures of powdered saluyot leaves (*Corchorus olitorius*) as to:
  - 1.1 15 grams;
  - 1.2 30 grams;
  - 1.3 45 grams; and
  - 1.4 60 grams?
2. What is the assessment of the respondents in terms of different concentrations of giant swamp taro (*Cyrtosperma merkusii*) flour as to:
  - 2.1 150 grams;
  - 2.2 200 grams;
  - 2.3 250 grams; and
  - 2.4 300 grams?
3. What is the acceptability level as determined by food experts /consumers along with the four (4) variants of giant swamp taro flour kropek chips enriched with saluyot as to:
  - 3.1 appearance;
  - 3.2 aroma;
  - 3.3 crunchiness;
  - 3.4 flavor, and
  - 3.5 texture?
4. What is the result of the phytochemical analysis of the Giant Swamp Taro Flour Enriched with Saluyot Powdered kropek sample?

## METHODOLOGY

### Research Design

The study utilized the developmental-descriptive research design. This is the appropriate method because it developed a product and described its physical characteristics. Moreover, it was experimental because it determined which of the formulations or mixtures of giant swamp taro flour enriched with saluyot is acceptable. The samples are grouped accordingly with controlled measures of giant swamp taro flour; 150 grams, 200 grams, 250 grams, and 300 grams, respectively. Also, the content of saluyot powder; is 15 grams, 30 grams, 45 grams, and 60 grams. These different controlled mixtures were evaluated through their qualitative characteristics.

### Research Environment

The study was conducted at Loreto National High School Canteen (during the pandemic time). It is a public secondary school, Loreto National High School, in the province of Dinagat Islands. It was established on January 01, 1966. It is located at the poblacion of Loreto, PDI. It offers a complete Junior high school curriculum, from the K to 12 Basic Education Program. Currently, the school has 542 en-

rolled students. During this time of the pandemic, the school delivers the educational service through a modular printed modality. The geographical scope of Loreto, Province of Dinagat Islands has a land area of 155.82 square kilometers which constitutes 9,690 inhabitants in the latest Census of 2020.

### Respondents

There were 61 respondents which were composed of Secondary School Teachers handling TLE subjects in Loreto District, personnel from LGU DOT and DTI, bakery operators, and members of LIWA.

**Table 1. Distribution of Respondents**

| Respondents  | f         | %             |
|--|-----------|---------------|
| Panamaon NHS   | 4         | 6.6           |
| Loreto NHS   | 4         | 6.6           |
| Liberty NHS  | 2         | 3.3           |
| Loreto Academy   | 2         | 3.3           |
| Senior High School Teachers handling Technical-Vocational Livelihood -specialized in Food and Beverage (TVL-FBS) | 2         | 3.3           |
| Department of Trade and Industry-Negosyo Center Personnel  | 2         | 3.3           |
| Department of Tourism Office Personnel   | 7         | 11.39         |
| Bakery Business establishments   | 8         | 13.11         |
| Liberty Women Association (LIWA)   | 30        | 49.18         |
| <b>Total</b>   | <b>61</b> | <b>100.00</b> |

### Research Instrument

A researcher-made questionnaire was used as a gathering tool in determining the level of acceptability of the product in terms of appearance, aroma, crunchiness, flavor, and texture.

### Data Analysis

To analyze the quantitative data of this study, the following statistical tools were also utilized:

**Percent.** This tool was used to determine the amount in grams of giant swamp taro flour and powdered saluyot which are the main ingredients in this food product.

**Mean and Standard Deviation.** These tools were used for the development and acceptability of the giant swamp taro flour kropek chips enriched with saluyot is in both quantitative; for the measurements of ingredients and qualitative descriptions as perceived by the consumers in (appearance, aroma, sound, flavor, texture, and temperature).

## RESULTS AND DISCUSSIONS

### Assessment of the Respondents in terms of different Concentrations/Mixtures of Powdered Saluyot Leaves (*Corchorus olitorius*)

Table 2 presents the assessment of the respondents in terms of different concentrations/mixtures of powdered saluyot leaves (*Corchorus olitorius*).

The Table shows the computed score value for the acceptability of the products according to the different concentrations of saluyot leaves (*Corchorus olitorius*) in the Giant Taro Kropek Chips Enriched with Saluyot.

In testing the appearance of the product, the Table shows a Very Acceptable rating given by the respondents having an average response of 4.34 on the sample containing a mixture concentration of 45g and 60g of saluyot leaves, respectively.

**Table 2. Assessment of the respondents in terms of different concentrations/mixtures of powdered saluyot leaves (*Corchorus olitorius*)**

| Sensory Evaluation   | 15 grams                             |                | 30 grams                             |                | 45 grams                             |                | 60 grams                             |                |
|----------------------|--------------------------------------|----------------|--------------------------------------|----------------|--------------------------------------|----------------|--------------------------------------|----------------|
|                      | Total score/<br>number of<br>testers | Score<br>value | Total score/<br>number of<br>testers | Score<br>value | Total score/<br>number of<br>testers | Score<br>value | Total score/<br>number of<br>testers | Score<br>value |
| Appearance           | 4.08                                 | A              | 1.68                                 | NA             | 4.48                                 | VA             | 4.47                                 | VA             |
| Aroma                | 1.89                                 | LA             | 2.09                                 | LA             | 3.98                                 | A              | 3.30                                 | N              |
| Crunchiness          | 2.02                                 | LA             | 2.94                                 | N              | 3.86                                 | A              | 3.39                                 | N              |
| Flavor               | 3.93                                 | A              | 1.92                                 | LA             | 4.85                                 | VA             | 2.68                                 | LA             |
| Texture              | 1.61                                 | NA             | 2.60                                 | LA             | 4.51                                 | VA             | 2.41                                 | N              |
| <b>Average Score</b> | <b>2.71</b>                          | <b>N</b>       | <b>2.25</b>                          | <b>LA</b>      | <b>4.34</b>                          | <b>VA</b>      | <b>3.25</b>                          | <b>N</b>       |

| Rating Scale | Descriptive Equivalent |
|--------------|------------------------|
| 4.21 – 5.00  | Very Acceptable (VA)   |
| 3.41 – 4.20  | Acceptable (A)         |
| 2.61 – 3.40  | Neutral (N)            |
| 1.81 – 2.60  | Less Acceptable (LA)   |
| 1.00 - 1.80  | Not Acceptable (NA)    |

Moreover, participants rated **Not Acceptable** on the sample having a 30g concentration or mixture as their responses have an average score of 1.68, while the sample containing a mixture of 30g was rated **Acceptable** by the respondents.

Hutchings (n.d) emphasizes the importance of appearance in food. He said that the first impression of food is usually visual and a major part of one's willingness to accept a food depends on its appearance.

As to the Aroma test, the respondents graded **Acceptable** on the sample that contains a 45g mixture of saluyot leaves powder. Also, the respondents scored at 3.30 or **Neutral** on the sample containing a mixture of 60g of saluyot leaves powder. However, there was a slightly different response to the samples containing the mixtures of 15g and 30g of saluyot leaves powder as these samples were rated **Less Acceptable** by the respondents.

*Aromas* play a pivotal role in the perception of food. Before one even tastes the food, the whiff and aroma through the olfactory nerves enter one's mind is being considered first. Mishra (2022) emphasizes that the infusion of aroma in food has a rich culinary heritage in her country and has seen an evolution through the centuries, one of the first parameters of good food as per Indian culinary science is concerned.

With respect to the crunchiness of the product, the sample with a 45g mixture has an average score of 3.86, described as **Acceptable** based on the responses of the participants. The participants scored at 2.94 and 3.39 on the product sample having 30g and 60g concentrations, respectively. However, the sample containing a 15g mixture was rated **Less Acceptable** on the part of the participants.

As to the flavor and texture of the product, it registered the rating of **Very Acceptable** on the item that contains a 45g mixture. However, for the mixture containing a 30g of saluyot powder, the respondents gave a rating of **Less Acceptable** as this sample scored at 1.92 and 2.60, respectively.

In general, the Table shows a **Neutral** assessment with respect to 15g concentration, as most of their responses have an average score of 2.71. In addition, they have slightly different responses in the mixture of 45grams and 60 grams, thus rated **Less Acceptable** and **Neutral**, respectively.

On the other hand, only the 45 grams mixture shows a positive response from the participants having a computed average score of 4.34, the mixture was the most preferred mixture by the participants who rated this as **Very Acceptable**.

### **Assessment of the Respondents in terms of Different Concentrations of Giant Swamp Taro (*Cyrtospermamerkusii*) Flour**

Table 3 shows the computed score value for acceptability of the participants of the different concentrations of giant swamp taro (*Cyrtospermamerkusii*), in the Giant Taro Kropek Chips Enriched with Saluyot.

**Table 3. Assessment of the respondents in terms of Different concentrations of Giant Swamp Taro (*Cyrtospermamerkusii*) Flour**

| Sensory Evaluation   | 150 grams                         |                | 200 grams                         |                | 250 grams                         |                | 300 grams                         |                |
|----------------------|-----------------------------------|----------------|-----------------------------------|----------------|-----------------------------------|----------------|-----------------------------------|----------------|
|                      | Total score/<br>number of testers | Score<br>value | Total score/<br>number of testers | Score<br>value | Total score/<br>number of testers | Score<br>value | Total score/<br>number of testers | Score<br>value |
| Appearance           | 4.77                              | VA             | 4.31                              | A              | 4.04                              | A              | 4.31                              | VA             |
| Aroma                | 4.57                              | VA             | 3.33                              | N              | 4.03                              | A              | 3.33                              | N              |
| Crunchiness          | 1.65                              | NA             | 3.60                              | A              | 3.90                              | A              | 3.12                              | N              |
| Flavor               | 2.16                              | LA             | 2.16                              | LA             | 3.93                              | A              | 2.67                              | N              |
| Texture              | 2.89                              | N              | 2.89                              | LA             | 3.78                              | A              | 2.61                              | N              |
| <b>Average score</b> | <b>3.21</b>                       | <b>N</b>       | <b>3.26</b>                       | <b>LA</b>      | <b>3.93</b>                       | <b>A</b>       | <b>3.21</b>                       | <b>N</b>       |

| Rating Scale | Descriptive Equivalent |
|--------------|------------------------|
| 4.21 – 5.00  | Very Acceptable (VA)   |
| 3.41 – 4.20  | Acceptable (A)         |
| 2.61– 3.40   | Neutral (N)            |
| 1.81 – 2.60  | Less Acceptable (LA)   |
| 1.00 - 1.80  | Not Acceptable (NA)    |

The Table shows a **Neutral** assessment of the participants with respect to 150 grams and 300 grams concentration as most of their responses have an average score of 3.21. In addition, the responses in the mixture of 200 grams, having an average score of 3.26 was rated **Less Acceptable**. While the 250 grams mixture shows a positive response from the participants having a computed average score of 3.93, the mixture was the most preferred mixture by the participants as rated **Acceptable**.

In testing respondents' assessment of the product in terms of varying concentrations or mixtures of giant swamp taro flour, the researcher used sensory evaluation, namely, appearance, aroma, crunchiness, flavor, and texture as criteria.

A similar table shows that as to appearance, the mixture containing 150 grams and 300 grams of giant swamp taro flour scored at 4.77 and 4.31, respectively, participants rated these two mixtures **Very Acceptable**. However, compared to the rest of the product, the mixture containing 150 grams of giant swamp taro flour is the most preferred mixture by the respondents in terms of its aroma, as a result, the respondents have shown a positive response having a computed score of 4.57 and was rated **Very Acceptable**.

Comparing the flavor and texture of the products that contain the varying mixture of giant swamp taro flour, respondents have rated **Acceptable** rating to the mixture of 250 grams of the flour.

As to the crunchiness of the product, although there was a slight difference between the products containing 200 grams and 250 grams of giant swamp taro flour the respondents' responses show that the mixture of 250 grams of flour is crunchier compared with the mixture of 200 grams flour.

### Level of Acceptability

The level of acceptability of the product as assessed by the respondents for the four (4) variants of giant swamp taro flour kropek chips enriched with saluyot as to the indicators cited in subproblem 3 are discussed in Tables 4-8.

**Table 4. Level of Acceptability of the Giant Taro Kropek Chips Enriched with Saluyot as a product with respect to Appearance**

| Appearance                                      | Mean        | Qualitative Description     |
|---|-------------|-----------------------------|
| 1. The color of kropek chips is golden brown.   | 4.85        | Very Acceptable (VA)        |
| 2. The color of the kropek chips is overcooked. | 4.51        | Very Acceptable (VA)        |
| 3. The kropek chip has a pale color.            | 3.89        | Acceptable (A)              |
| 4. The kropek chip has a dark color.            | 4.31        | Very Acceptable (VA)        |
| <b>Average Mean</b>                             | <b>4.39</b> | <b>Very Acceptable (VA)</b> |

| Rating Scale | Descriptive Equivalent |
|--------------|------------------------|
| 4.21 – 5.00  | Very Acceptable (VA)   |
| 3.41 – 4.20  | Acceptable (A)         |
| 2.61– 3.40   | Neutral (N)            |
| 1.81 – 2.60  | Less Acceptable (LA)   |
| 1.00 - 1.80  | Not Acceptable (NA)    |



It can be seen that most observations of the participants are rated Very Acceptable. It can be seen also that the computed mean of 4.39 wrapped up the responses of the participants to a Very Acceptable level of the Giant Taro Kropek Chips Enriched with Saluyot.

The participants showed an insignificant deviation in rating the appearance of the Kropek with respect to the varying concentration of mixtures. Most of their scores are rated as Very Acceptable. Among the different groups of participants, the survey showed that the respondents were able to know that the color of the final output of the product could be golden brown to a slightly darker color due to the main ingredients used.

**Table 5. Level of Acceptability of the Giant Taro Kropek Chips Enriched with Saluyot as a product with respect to Aroma**

| Aroma   | Mean        | Qualitative Description |
|---|-------------|-------------------------|
| 1. The kropek chip smell like saluyot         | 3.33        | Neutral (N)             |
| 2. The kropek smell is good                   | 3.60        | Acceptable (A)          |
| 3. Kropek chips have a giant swamp taro aroma | 4.04        | Acceptable (A)          |
| 4. Kropek chips have a foul/stinky smell      | 4.03        | Acceptable (A)          |
| <b>Average Mean</b>                           | <b>3.75</b> | <b>Acceptable (A)</b>   |

| Rating Scale | Descriptive Equivalent |
|--------------|------------------------|
| 4.21 – 5.00  | Very Acceptable (VA)   |
| 3.41 – 4.20  | Acceptable (A)         |
| 2.61– 3.40   | Neutral (N)            |
| 1.81 – 2.60  | Less Acceptable (LA)   |
| 1.00 - 1.80  | Not Acceptable (NA)    |

It can be seen that most of the observations of the participants are rated **Acceptable**. As it can be seen also that the computed mean of 3.75 suggests that the responses of the participants have reached the acceptable level of the product.

On average, the increasing concentration of saluyot powder did not have a significant change in the aroma of the kropek as it can be gleaned from the above Table that the varying concentrations of enhancers have a neutral effect on the final product.

Moreover, participants have rated 4.04 or **Acceptable** the aroma produced by the Kropek to have as the smell of giant swamp taro. Understandably, considering that the main ingredient of the kropek is giant swamp taro flour, the aroma of the product would be likely that of giant swamp taro as it can be seen also that the participants rated **Acceptable** the smell of the kropek chips.

**Table 6. Level of Acceptability of the Giant Taro Kropek Chips Enriched with Saluyot as a Product with respect to Crunchiness**

| Crunchiness   | Mean        | Qualitative Description |
|---|-------------|-------------------------|
| 1. The kropek chips are crispy                        | 3.90        | Acceptable (A)          |
| 2. Kropek chips produce a loud crunch when munched.   | 4.48        | Very Acceptable (VA)    |
| 3. Kropek chips have no crunch                        | 3.93        | Acceptable (A)          |
| 4. Kropek chip has produced less crunch when munched. | 3.98        | Acceptable (A)          |
| <b>Average Mean</b>                                   | <b>4.07</b> | <b>Acceptable (A)</b>   |

| Rating Scale | Descriptive Equivalent |
|--------------|------------------------|
| 4.21 – 5.00  | Very Acceptable (VA)   |
| 3.41 – 4.20  | Acceptable (A)         |
| 2.61– 3.40   | Neutral (N)            |
| 1.81 – 2.60  | Less Acceptable (LA)   |
| 1.00 - 1.80  | Not Acceptable (NA)    |

It can be seen that most of the observations of the participants are rated Acceptable. It can also be seen the computed mean of 4.07 wrapped up the responses of the participants to an acceptable level of the Giant Taro Kropek Chips Enriched with Saluyot.

The crunchiness of the kropek was evident among the four (4) variants. However, the level of crunchiness varies among the participants of the study. It can be observed from the above Table that on average the participants rated at 3.90 that the product is crispy. The product was perceived to be brittle yet tender. It can be further shown in the above-presented Table that most of the participants rated Very Acceptable when they ate the kropek.

**Table 7. Level of Acceptability of the Giant Taro Kropek Chips Enriched with Saluyot as a Product with respect to Flavor**

| Flavor                                   | Mean        | Qualitative Description     |
|--|-------------|-----------------------------|
| 1. The kropek chips are salty in flavor. | 3.86        | Acceptable (A)              |
| 2. The kropek chips have a bitter taste. | 4.85        | Very Acceptable (VA)        |
| 3. The kropek chips have a bland taste.  | 4.51        | Very Acceptable (VA)        |
| 4. Kropek chips have good taste.         | 3.85        | Acceptable (A)              |
| <b>Average Mean</b>                      | <b>4.26</b> | <b>Very Acceptable (VA)</b> |

| Rating Scale | Descriptive Equivalent |
|--------------|------------------------|
| 4.21 – 5.00  | Very Acceptable (VA)   |
| 3.41 – 4.20  | Acceptable (A)         |
| 2.61 – 3.40  | Neutral (N)            |
| 1.81 – 2.60  | Less Acceptable (LA)   |
| 1.00 - 1.80  | Not Acceptable (NA)    |

On the other hand, statements 3 and 4 “The kropek chips have a bitter and bland taste” was rated Very Acceptable by the participants and the negative statement was reverted to a positive score. This means that this statement meets the acceptability standard of the participants based on their observation of the product.

It can be gleaned that most of the observations of the participants are rated Acceptable. As it can be seen also the computed mean of 4.48 capsulized the responses of the participants to the Very Acceptable level of the Giant Taro Kropek Chips Enriched with Saluyot.

**Table 8. Level of Acceptability of the Giant Taro Kropek Chips Enriched with Saluyot as a product with respect to Texture**

| Texture  | Mean        | Qualitative Description     |
|--|-------------|-----------------------------|
| 1. The kropek chips have a gritty texture              | 3.98        | Acceptable (A)              |
| 2. The kropek chips have a smooth texture              | 3.94        | Acceptable (A)              |
| 3. The texture of the kropek chips has a hard texture  | 4.34        | Very Acceptable (VA)        |
| 4. The texture of the kropek chips has a chewy texture | 4.19        | Acceptable (A)              |
| <b>Average Mean</b>                                    | <b>4.48</b> | <b>Very Acceptable (VA)</b> |

| Rating Scale | Descriptive Equivalent |
|--------------|------------------------|
| 4.21 – 5.00  | Very Acceptable (VA)   |
| 3.41 – 4.20  | Acceptable (A)         |
| 2.61 – 3.40  | Neutral (N)            |
| 1.81 – 2.60  | Less Acceptable (LA)   |
| 1.00 - 1.80  | Not Acceptable (NA)    |

The hardness of the texture of the kropek is natural and understandable as it is the result of the method of cooking the product. The mean of 4.34 by the participant showed that the hard texture is Very Acceptable. Likewise, it can be observed that most respondents scored 4.19 for the chewy texture of the product.

**Table 9. Summary on the Level of Acceptability of the Giant Taro Kropek Chips Enriched with Saluyot as a Product**

| Acceptability     | Mean         | Qualitative Description |
|-------------------|--------------|-------------------------|
| Appearance        | 4.39         | Very Acceptable (VA)    |
| Aroma             | 3.75         | Acceptable (A)          |
| Crunchiness       | 4.07         | Acceptable (A)          |
| Flavor/taste      | 4.26         | Very Acceptable (VA)    |
| Texture           | 4.48         | Very Acceptable (VA)    |
| <b>Grand mean</b> | <b>4.192</b> | <b>Acceptable (A)</b>   |

| Rating Scale | Descriptive Equivalent |
|--------------|------------------------|
| 4.21 – 5.00  | Very Acceptable (VA)   |
| 3.41 – 4.20  | Acceptable (A)         |
| 2.61– 3.40   | Neutral (N)            |
| 1.81 – 2.60  | Less Acceptable (LA)   |
| 1.00 - 1.80  | Not Acceptable (NA)    |

The Table reveals that most of the participants have a rating of Very Acceptable with a scale that falls within 4.21–5.00. This means that the appearance, flavor, and texture, favored the acceptability perception of the participants. On the other hand, the participants have an Acceptable response to the Aroma and Crunchiness of the product, having a computed mean of 3.75 and 4.07 respectively. Thus, suggesting an acceptable response to the product.

### Results of the Phytochemical Analysis

Figure 2 reveals the phytochemical results on the proximate chemical composition of the giant taro flour enriched with saluyot powdered kropek sample.

**Figure 2. Phytochemical results on the proximate chemical composition of the Giant Taro Flour Enriched with Saluyot Powdered Kropek sample**

| PARAMETERS              | Lab Ref No. /Sample ID                                     | Methods          |  |
|-------------------------|--|------------------|--|
|                         | F <sub>1</sub> -22-288                                     |                  |  |
|                         | Giant Swamp Taro Flour Enriched with Saluyot Powder Kropek |                  |  |
| Crude Protein, %        | 4.7  | Kjeldahl         |  |
| Ash, %                  | 6.5  |                  |  |
| Crude Fat, %            | 22.8   |                  |  |
| Carbohydrates           | 64.8   | Gravimetric      |  |
| Calories / 100g         | 483.2  |                  |  |
| Calcium, %              | 0.30   | Dry Ashing - AAS |  |
| Magnesium, %            | 0.13   |                  |  |
| Zinc, ppm               | 59.7   |                  |  |
| Iron, ppm               | 145  |                  |  |
| Manganese, ppm          | 67.9   |                  |  |
| Sodium, %               | 1.8  |                  |  |
| Potassium, %            | 0.42   |                  |  |
| *** Nothing Follows *** |  |                  |  |

It shows that the giant swamp taro flour kropek chip enriched with saluyot is a healthy snack for it is high in calories (483.2) which indication of abundant carbohydrates. Also, points out that kropek chip snacks are high in iron that can bust once hemoglobin is in the body. Thus, it is a healthy snack.

## CONCLUSIONS

This study concluded the viability of producing different mixtures in preparing kropek chips food. Adding the different amounts of enhancers like saluyot powder will increase the amount of the regular mixtures thus affecting its appearance, aroma, taste, and texture. Although some mixtures were acceptable from the ratings of the participants there was only one mixture that was very consistent based on the sensory evaluation of the raters. This is the mixture of 45 grams saluyot and 250 grams taro flour. This study further concluded that it is a healthy snack.

## RECOMMENDATIONS

1. An alternative preservation and packaging for the kropek chips.
2. Research that focuses on the stability of kropek chips made using this preferred formulation and the improved processing method is necessary to prolong the shelf life.
3. Further analysis of the other chemical and physical characteristics of kropek chips may be conducted.
4. Utilize the developed kropek in other Filipino snacks to examine its efficacy and applicability to other snack foods.
5. The product should be filed as a utility model to the intellectual property of the Philippines for registration and IP protection.

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# RESURFACING THE *PASTORA* DANCE OF TALISAY IN CAMARINES NORTE, PHILIPPINES

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## ABSTRACT

**This research resurfaces an almost forgotten dance of Pastora in Talisay, Camarines Norte as part of a larger NCCA and CHED funded research project that sought to document traditional performing arts in the entire Bikol Region. Last performed in the 1980s and with its former performer and its only living trainer now 88 years old and blind, the Pastora dance is facing extinction in this part of the region. The study aimed to describe the Pastora dance in Talisay, Camarines Norte in terms of 1) the detailed dance notation 2) musical notation and recording, and 3) description of costumes, dance implements, and venue using qualitative design procedures.**

*Keywords: traditional dance, dance documentation, intangible cultural heritage*

## INTRODUCTION

Cultural heritage does not only refer to physical structures but also to intangible cultural heritage (ICH)--oral traditions handed down from one generation to the other (UNESCO, n.d.). There is a need to safeguard Intangible cultural heritage because it is threatened by urbanization, industrialization, migration, and globalization. Its continuity is not ensured without proper documentation because it mainly relies on oral, aural, and kinesthetic modes of transmission. Failure to sustain these ways of transmission would lead to cultural heritage extinction which would create a potential gap in the knowledge of people's identity, history, and culture.

An example of ICH that needs protection is the traditional dance. As an ICH, dance is important because it carries with it expressions of vernacular knowledge and skills, it fosters social cohesion, it establishes social identity among others. Due to its oral mode of transmission, dance is temporal and can be easily lost.

In Bikol Region, the existence of dance as an important intangible cultural heritage is not without its woes. In dance and physical education classes in Bikol, focus of teaching is on national dances as these are the kind of materials readily available. For example, in Aquino's (1960) six-volume compendium of Philippine dances, only a few Bikol dances have been included. SAYAW, a publication of newly researched Philippine dances rarely includes Bikol dances as well. It is then common that a Bikolano student would be taught dance steps and dance terminologies coming from other regions (i.e. Tagalog Region and ARMM) whose performing arts have been extensively researched and widely published by scholars. Bikol dances are therefore marginalized in the curriculum because of the lack of materials for this art. In addition, most of the culture bearers are old. If these lesser known dances are not surfaced by researchers, the distinct dance steps/movements/choreography, the implements and costume, and the verses and music that go with these dances will be left forgotten.

This research therefore attempted to articulate one of these artisanal creative performances which have been sidelined in the curriculum. It falls under the genre of qualitative-advocacy research (Cresswell, 2014) because of its inclination to give voice to individuals that may be marginalized such as the farmers, fisher folks, housewives, children among others and their performing arts, which may have

been branded by the elite as *barriotic*, 'bakya,' or 'baduy.' The recognition of their performing arts through this research would help legitimize the existence and importance of these cultural artefacts by mainstreaming and disseminating these along with other arts through different means such as its inclusion in the curriculum. Moreover, this research ensures the availability of Bikol performing arts materials for further study and as rehearsal aids among students, scholars, cultural commentators, and others.

Teachers, students, and Bikolanos in general no longer need to look at the center to define their artistic and aesthetic expressions. This study is a conscious effort to turn away from the cultural canon (foreign and national) and focus its attention to the peripheries (local and regional). It is in the researcher's belief that Bikolanos do not need to heed the center's affirmation--the local offers as much artistic cultural vibrancy as the other regions. Through the articulation of this aspect of Bikol cultural heritage, the Bikol region will become visible to itself and to the rest of the country and perhaps to the world.

This research therefore has resurfaced an almost forgotten dance of *Pastora* in Talisay, Camarines Norte as part of a wider NCCA and CHED funded research project that sought to document traditional performing arts in the entire Bikol Region. Last performed in the 1980s and with its former performer and its only living trainer now 88 years old and blind, the *Pastora* dance is facing extinction in this part of the region.

Ethnochoreology is the term used to preserve dance through its notation in order to be documented, analysed, and copyrighted. Numerous measures have already been done by researchers and choreographers so as to safeguard and copyright dance. Abroad, Rudolf and Benesh ([www.royalacademyofdance.org](http://www.royalacademyofdance.org)) developed a system of representing dance movements for staging in 1956. In the Philippines, Francisca Reyes Aquino (1960) documented and notated Philippine folk dances as early as 1927. She developed her own dance notation format which had been adopted in this study. Ramon Obusan had published on several occasions his dance notations of different researched folk dances in *Sayaw: Dance of the Philippine Islands*, a series of books published by Philippine Folkdance Society. Although there have been publications of dance notation in the Visayas region (Fajardo, 1974) and Pangasinense (Friese, 1980) no collection of Bikol dance notations has been published yet. This study therefore is an attempt to fill the gap in Bikol dance research.

## OBJECTIVES

The study aimed to describe the *Pastora* dance in Talisay, Camarines Norte in terms of:

1. the detailed dance notation;
2. musical notation and recording, and
3. description of costumes, dance implements, and venue.

## METHODOLOGY

### Design

This research employed qualitative research procedures. A qualitative research is a field of inquiry that relies heavily on non-numerical data to describe and understand human experience (Glesne and Peshkin, 1992). It takes place in natural settings by observing behavior/performance and talking to informants in their contexts. The researcher has collected both real time and ex-post facto data himself by gathering multiple forms of data such as interviews, observations, documents, and audiovisual information.

### Participants

This study used purposive sampling in order to choose participants who can provide with detailed information about the dance being investigated. Visits were done in Talisay, Camarines Norte where the *Pastora* was once performed. The researcher talked with participants explaining the nature and objectives of the project. Letters were sent to obtain their consent. Only those who responded positively were involved in the study. It was difficult to find key informants in Talisay. For instance, two of the *Pastora* dancers are now more than 80 years old and could hardly recall the specific steps and lyrics of the song

that was performed along with the dance. One could simply hum the tune while the other could only remember a close step close movement of the feet. The researcher was then referred to its former trainer who was about 82 years old during the time of the interview. She could clearly remember the steps/choreography, lyrics, costumes, implements, and other pieces of information related to the dance in question. She was then considered as the sole key informant of this research.

### **Locale**

The research was conducted in Talisay, a fourth class municipality in Camarines Norte. It was chosen based on the recommendation by certain key informants upon the researcher's initial visit to the said province.

### **Data Collection**

The present study made use of qualitative data elicitation procedures. The following details the data collection procedure observed:

- 1) determined locale where traditional dances could have developed and survived as suggested by resource persons;
- 2) identified the culture bearers in the community;
- 3) gathered ex-post facto data by conducting structured and semi-structured interviews with key informants with the purpose of surfacing the history and background of the dance, the dance steps, dance terms, songs, verses, musical instruments, props and implements used;
- 4) conducted focus group discussions with cultural bearers (trainers, participants, Hermanas, etc.);
- 5) gathered real time data (aural and visual evidence) by conducting participant observations where the researcher witnessed and recorded through audio, video, still pictures, and observers' notes/diaries the performance of *Pastora*;
- 6) gathered ancillary evidence such as production materials like sets, set designs, lighting designs; costumes/costume designs, and implements;
- 7) transcribed interviews for inclusion in the description of the dance;
- 8) printed still pictures for inclusion in the background information of the dance;
- 9) meticulously notated dance steps/choreography using the dance notation format of Francisca Reyes-Aquino;
- 10) transcribed verses and songs that go with the performance of the dances, and
- 11) notated the music of *Pastora*.

### **Findings**

This research was partly propelled by that challenge to pursue dance research by seeking to document a traditional performing art called *Pastora* in Talisay, Camarines Norte. Villaruz (2007) argues that "the drive to dance is strong in our culture" (p. 13). He goes on to claim that Francisca Reyes Aquino, the National Artist for Dance, has "left us with the challenge to steer forward and amplify the dance research and scholarship to which she dedicated her life and career" (p. 14).

In this study, the dance steps, music, costume, and implements have been resurfaced in order to form part of an archive of Bikol dances. *Pastora*, also known as *Pastores*, is a Christian dance among the lowland inhabitants of Bikol and some regions such as Tagalog and Visayas. It is usually performed during the Christmas Season as an invitation to the people to join the performers in visiting Bethlehem, the birthplace of Jesus. Its origin could be traced back to Spain and Mexico where a tradition called *los Posadas* re-enacts the search for Inn by Joseph and Mary. A song and dance performance called *Bailo de los pastores* follows in which the performers call on people to go to Bethlehem to see the child Jesus (Margate, 2017).

In Talisay town of Camarines Norte, the Philippines, the key informant claimed to have performed it in the 1940's and later on devoted part of her time into teaching the said dance well into the 1980s. However, the *Pastora* tradition was discontinued thereafter as the people grew tired of it--in her words: *nagsawa na*. Ramon Obusan, the National Artist for Dance and a native of Camarines Norte himself, used this dance as inspiration for his published *Pastores* Talisay. However, his version is quite different from the original in terms of choreography, costume, and musical arrangement. The original version had therefore been side-lined. This version, in contrast, is simpler in terms of choreography and costume.

The para-pastora or pastora dancers/performers are formed into two parallel lines facing the audience with each line composed of three or more girls. A boy called kapitan and his female dance partner called kapitana are positioned in the center of the formation acting as leaders of the group. There are at least three major movements that are particular to the dance. The first movement is called the change step in which a step close step is done while counting 1 and 2. The second step involves a step, close step of the feet to a  $\frac{3}{4}$  time measure (counting one, two three; one, two, three, and so on). Finally, a place, place, step-close-step, similar to a heel and toe change step is done, counting 1,2 and 2 to a measure. The change steps are reminiscent of the polka dance commonly performed in Eastern European countries. The waltz has semblance to the waltz performed in Viennese Palaces in Austria. Not surprisingly, the steps are heavily influenced by European dance movements because of the Spanish occupation of the Philippines.

However, the dance movements have been appropriated by Filipinos to serve their own purpose. For example, the polka steps do not necessarily replicate the original polka dance in which the dancers jump high up in the air then circle around a performance space. The appropriated polka is conservative in style as the dancers hop just a few inches from the ground without circling around the floor. The waltz is also not as quick as that of Viennese Waltz and dancers do not dance around the entire dance floor. The appropriation of the steps has been done to respond to the limitations of the performance space. While polka and Viennese waltz are performed on wide dance floors (Viennese waltz is performed on wide glassy dance floors/ ballrooms of Palaces and courts), the Pastora, on the other hand, is performed on the side or shoulder lane of a street, an entryway of a house or establishment, or a garage with very limited space for performers to move about. Although the restricted space puts limits to the movements of the para-pastora, the performance itself is intimate as both the audience and performers almost share the same space. The dancers are not alienated from the audience unlike those dances performed on proscenium stage with lavish lighting and curtain decors. The performance can also be viewed from the front, side and back unlike in a proscenium stage where the performers are elevated from the audience and that spectators are hierarchically seated in front of the said stage.

### Dance Notation of Pastora

Below presents an excerpt of the dance notation following the dance notation format used by Francisca Reyes Aquino

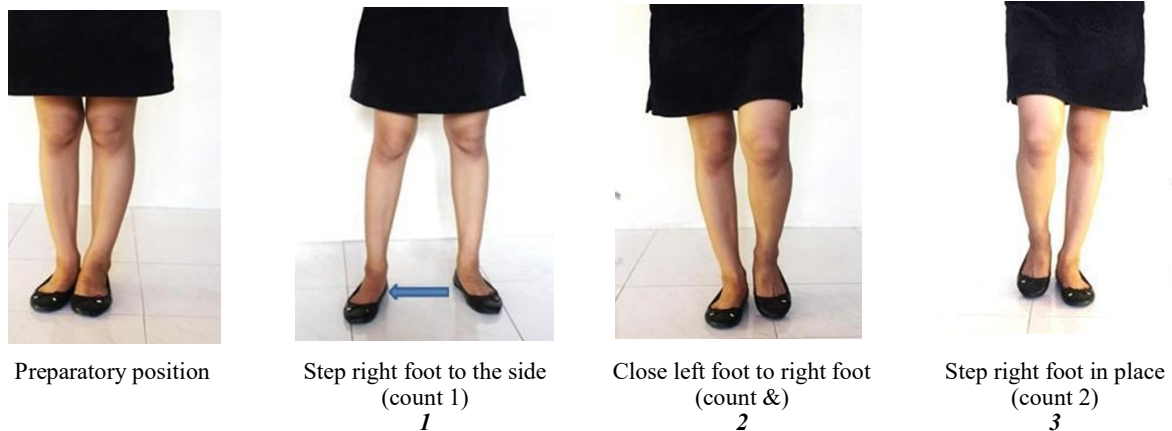
|   |   |
|---|---|
| Entrance:<br>a.) Change step right and left alternately Fig. 1.<br>a.) Change step right and left alternately while swaying garland/arch of flowers right and left.<br>b.) Face partner. Take two change steps sideward right and left (2m), then take two (2) close steps starting with right foot forward and backward (2m).<br>Sway garland from down to up then reverse when moving backward.<br>c.) Slow music. Take four (4) steps starting with right foot to exchange places with partner.<br>d.) Repeat (a-c). | 8m<br><br><br><br><br><br>4m<br>2m<br>14m |
| Fig. 2. Waltz<br>a.) Face audience. Execute two (2) waltz sideward right and left alternately while waving garland right and left.<br>b.) Waltz forward and backward Waving garland upward and downward<br>c.) Quarter turn. Repeat (a-b)<br>d.) Repeat (a-c) three times more.   | 2m<br>2m<br>4m<br>8m                      |
| Fig. 3.<br>a.) Place right foot to front (ct.1), Place the same foot back (ct. 2), step, close, step (ct. 1 and 2)<br>b.) Repeat three times more Moving forward.<br>c.) Starting with right foot, execute four (4) change steps, right and left alternately, moving backward 8m<br>d.) Repeat (a-c)  | 2m<br>6m<br><br>16m                       |

The dance notation is complemented with an instructional video that will be available on Youtube and other formats in order to make the dance available to anyone who wishes to perform, teach, or study it.

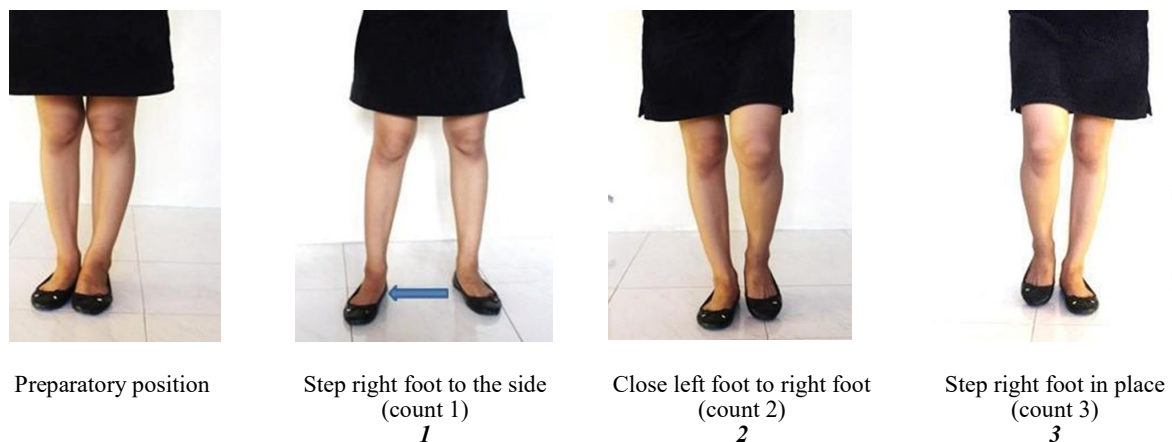
The pictures below illustrate the change steps and waltz steps particular to the dance of pastora. For the change step, the pattern is step, close, step. The dancers count 1 and 2 to a measure. The right foot is immediately raised after the left foot closes to the right to create a bouncy movement. The pattern is then repeated to the left. For the waltz step, the step pattern is step, close, step. The dancers count 1, 2, 3 to a measure. Counts 2 to 3 are performed with heels slightly raised. The whole pattern is repeated to the left.



**Figure 1. The change step movement**



**Figure 2. The waltz movement**



### **Musical Notation of Pastora**

There is no known record either audio or sheet music for the “authentic” Pastora in Talisay. Instead, the key informant sang the music to the researcher. The recorded version was then transcribed into sheet music an excerpt of which appears below. The music was recorded by musicians in a recording studio. It will be made available on Youtube and CDs along with the dance notation once the entire project is completed. The lyrics have also been transcribed.

The music of Pastora is celebratory in tone, articulating the jubilation and excitement towards the birth of Jesus. Sung in the Key of D and B, and on alternating 2/4 (marching rhythm) and ¾ time (waltz) signatures, the para-pastora sing verses, accompanied by a rondalla composed of a guitar, a violin, a banduria, and a double bass. Below is an excerpt of the song used in the performance together with its musical notation:

*Pastores a Belén, vamos con alegría  
a ver a nuestro bien, al Hijo de Maria.  
Allí, allí, nos espera Jesús.  
Pastores entrad, entrad zagales también.  
Vamos a ver al recién nacido,  
vamos a ver al Niño Emmanuel.*

English Translation:

Shepherds of Bethlehem  
With delight we are going to see the Son of Mary.  
Jesus is waiting for us there.  
Shepherds and boys, let us go and see the newborn,  
Let us go to see the Boy, God with us

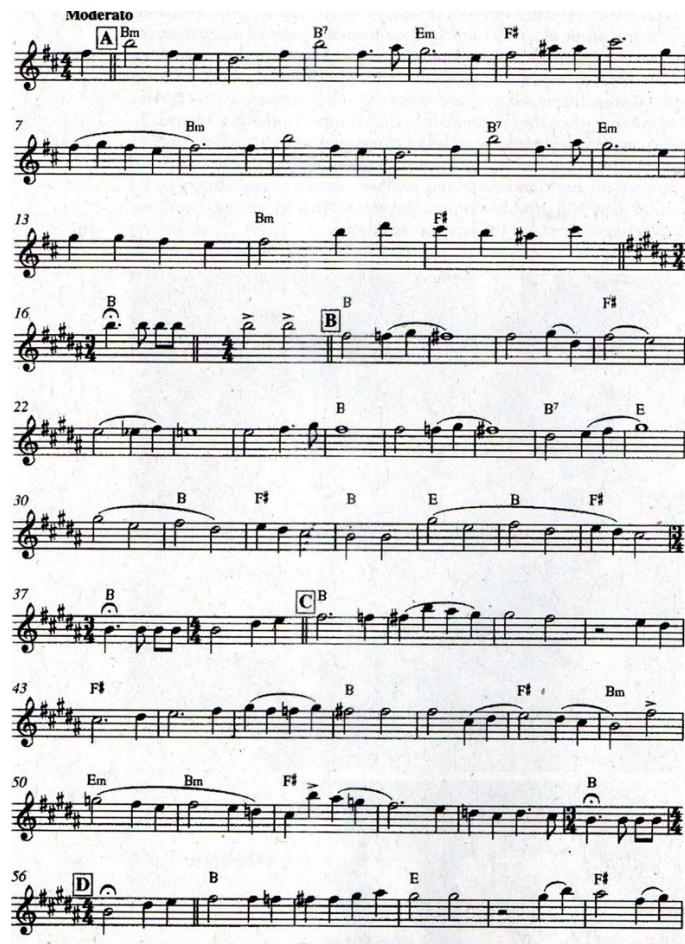


Figure 3. Excerpt from the music notation of Pastora Talisay

The verse tells of a group of believers who intend to see the manger in which Jesus was born while inviting others to join them as well. This is the reason why the Pastora dancers perform from one house to another in order to summon people to join them in their journey to Bethlehem. The marching rhythm somehow mimics the pace the walking pilgrims make.

### Costumes and Implement Used in Pastora

The costume for the Pastora Talisay is a simple knee-length white dress without adornment for girls and a long-sleeved white shirt and black pair of pants for the kapitan. The girls wear sandals while the male dancer wears a pair of black shoes. The girls wear wide-brimmed hats with flowers as decorations.

The implement used is a garland made of bent bamboo strip decorated with fresh flowers. These are held by the female performers and are manipulated into different figures by swaying it left and right, front and back, up and down, and so on.



Figure 4. *Pastora* dancers together with their musician from Baa0, Camarines Sur

About 40 years after its last performance, the *Pastora* of Talisay has been rediscovered through the help of its former performer and trainer who is now on her senior years. This detailed documentation will help safeguard this important cultural production. It will not suffer the fate of other performing arts which died along with the culture bearers--the trainers and performers.

## CONCLUSION

Dance is an important piece of cultural artefact. It has the power to promote cultural understanding and social unity/collectivity. The research attempted to resurface the dying tradition of *Pastora* in Talisay, Camarines Norte by documenting its dance movements, music, costume, and dance implements. This documentation will form part of an archive of Bikol Dances, a project funded by the Philippine government. The archive will be made available to anyone who wishes to promote and study Bikol dances. Although an archive is a good defence against cultural amnesia, the best way to preserve intangible cultural heritage is to practice it. It is therefore recommended that this traditional dance be included in the syllabus for Physical Education classes so it gets to be transferred to the new generation. It is also recommended that the local government of Talisay revive this dance tradition in deference to their ancestors who have pooled their creativity together in order to create this cultural production.

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# MORAL INTELLIGENCE AND STRESS TOLERANCE IN RELATION TO TEACHERS' BEHAVIORAL COMPETENCY

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## ABSTRACT

Education influences both individual and collective moral development. The classroom is saturated with moral meaning. What takes place in the classroom can either encourage or discourage the ability and desire to seek truth and serve the greatest good. The main thrust of this study was to determine the teachers' level of moral intelligence and stress tolerance in relation to their behavioral competencies in the public elementary schools of Alicia District, Division of Bohol for the School Year 2019-2020. There were a total number of one hundred seventy-six (176) respondents who participated in the survey, comprising of one hundred sixty (160) teachers and sixteen (16) school heads. The researchers used descriptive- survey research method design using modified questionnaires adapted from Lennick and Kiel (2005) on Moral Competency Inventory (MCI) which composed of 37 items; the dependent variable was measured using Stress Tolerance Scale of Simons and Gaher (2005) comprised with 15 items on the teachers' behavioral competency, and 30-item questionnaire by the Department of Education (DepEd) was also utilized during its implementation of the Results-Based Performance Management System (RPMS). The result of the study revealed that teachers' moral intelligence and stress tolerance had a significant relationship, teachers' behavioral competencies and moral intelligence affects each other while the teachers' behavioral competencies and stress tolerance had no significant relationship to each other. This study concluded that teachers have high level in stress tolerance that can generally handle and even able to cope high pressure situations. Finally, behaviorally competent teachers are morally intelligent.

*Keywords: behavioral competence, moral intelligence, stress tolerance, teachers*

## INTRODUCTION

Moral Intelligence is deemed as the capacity to comprehend what is right from what is wrong. It means to have a solid ethical conviction and to act on them so that one behaves in proper and honorable way (Borba, 2001)

Moral ideals are moral principles that guide behavior that manifests moral intelligence. Lennick and Kiel (2005) offered four moral competencies that characterize moral intelligence. These are integrity, responsibility, compassion, and forgiveness. These are the universally accepted values that should be in proper alignment to actions or behavior of individuals. Thus, it will be manifested through a very satisfactory in their work performance.

The role of the teacher is to create a just and caring environment. Teachers are models of moral education, exemplifying the virtues they seek to inspire their students. To do so, teachers need knowledge and competence to foster morality to others. Educational leader and administrators are to model these same behaviors towards the faculty, staff, students, parents, and others. Moral intelligence is highly associated with leadership effectiveness [2].

In view of the apparent increasing lack of morality in business and public affairs that has brought the United States and the world to the brink of economic collapse, the need to develop moral intelligence in the general population is of growing concern. Developing moral intelligence in the schools becomes problematic in a society that identifies morality with religion and believes that religion should not be taught in schools. In the United States, as the more overtly Christian influences in the schools were being banned because of First Amendment challenges, some schools either ignored moral education or turned to more values-free approaches such as values clarification and character education [3].

In the Philippines, the role of morality and moral intelligence have been challenged. Despite the expectations of the public and presence of government directives, teachers and students' moral and ethical development seems to be regarded as peripheral in teacher training institutions. There are graduates that destroy the good image of the teacher training institutions. There are school officials and teachers facing charges and complaints in the Department of Education, Civil Service Commission, Ombudsman and Trial Courts due to involvement in controversial issues such as immorality, drugs, and other civil and criminal cases.

Aquino (2010) further found out the decided cases in public educational institutions against school officials, teachers and non-teaching staff. The cases are administrative, criminal, and civil. The nature of the complaint are grave misconduct, conduct prejudicial to the best interest of the service, absence without approved leave, gross neglect of duty, gross insubordination, dishonesty, gross violation of civil service rules, refusal to perform official duty, falsification of official documents, conduct unbecoming of a dean, disrespect of authority, violation of the Magna Carta for public teachers, and disallowance of health care allowance. Most respondents were charged of grave offenses and were adjudged guilty of the offenses [4].

On the other hand, stress affects the employee's performance that indirectly affects the organization survival because if employees reduce their work efficiently and cannot work best for their organizations, this situation could also affect the organizational performance. It is the responsibility of management to fight against the stress at work, to identify the suitable course of action and solve them. Improving stress prevention is a positive action that contributes to a better health of workers and generates great organization efficiency and performance.

The theory of Cognitive Appraisal explained the mental process which is influenced by the stressors. According to their theory, stress is a two-way process; it involves the production of stressors by the environment, and the response of an individual subjected to these stressors. His conception regarding stress led to the theory of cognitive appraisal. He stated that cognitive appraisal occurs when a person considers two major factors that majority contribute in his response to stress. These two factors are: (1) the threatening tendency of the stress to the individual; and (2) the assessment of resources required to minimize, tolerate or eradicate the stressors it produces. In general, cognitive appraisal is divided into two types or stages: the primary and secondary appraisal [5].

Two concepts are central to any psychological stress theory: appraisal, i.e., individual's evaluation of the significance of what is happening for their well-being, and coping, i.e., individuals' efforts in thought and action to manage specific demands [6]. Since its first presentation as a comprehensive theory, the Lazarus stress theory has undergone several necessary revisions. In the latest version stress is regarded as a relational concept, i.e., stress is not defined as specific kind of external stimulation nor a specific pattern of physiological, behavioral, or subjective reactions. Instead, stress is viewed as a relationship ('transaction') between individuals and their environment.

Stress tolerance has four dimensions. These are (1) tolerance, (2) absorption, (3) appraisal, and (4) regulations [7]. The dimension of tolerance refers to the degree to which human beings perceive an ability to tolerate stressful event. Absorption dimension represents a distinct feeling consumed by negative emotions. Appraisal dimension represents an individual's assessment of stress tolerance. The dimension of regulation represents the urgency that an individual feels compelled to do something to alleviate the negative emotion [8].

An individual with low-stress tolerance sees stress as unbearable and describe feeling very upset or distressed. They are ashamed of the distress, unwilling to accept it and have the illogical belief that their coping resources are inferior to others. They work very hard to shun feeling distressed, and if unable to reduce it, they would report feeling overwhelmed by the experience which would compromise their functionality [9].



The 1987 Philippine Constitution provides and mandates protection and promotion of the right to quality education at all levels. This fundamental concept in Article IV, Section 1 of the constitution says, "The state shall protect and promote the right of all citizens to quality education at all levels and shall take appropriate steps to make each education accessible to all." In Article XIV, Section 5, Paragraph 4 stresses that "the state shall enhance the right of teachers to professional development"[10].

The indispensable role of the educational institution in achieving this mission under section 3(2) of Article XIV of the 1987 constitution that all educational institutions shall strengthen ethical and spiritual values, and develop moral character and personal discipline.

As stated in the Code of Professional Ethics for Teachers and School Officials in Article 11, Section 6 that teachers are duly licensed who possess dignity and reputation with high moral values as well as technical and professional competence in the practice of their noble profession, and they strictly adhere to, observe, and practice this set of ethical and moral principles, standards, and values. Moreover, it details on how teachers should relate to the state, the community, the teaching profession itself, the learners and the parents. Implicit to this code is that of the teacher's utmost professionalism to direct the students' behavior efficiently and project the ideal image of teachers in the community as well.

The aforementioned scenarios have prodded the researcher to investigate the moral intelligence and level of stress tolerance among the public elementary school teachers in Alicia District for the School Year 2019- 2020, and point out the connections of these variables. The researcher would also formulate interventions that are beneficial to the respondents to enhance their own self for the betterment of life and for the success in the educational endeavour.

## MATERIALS AND METHODS

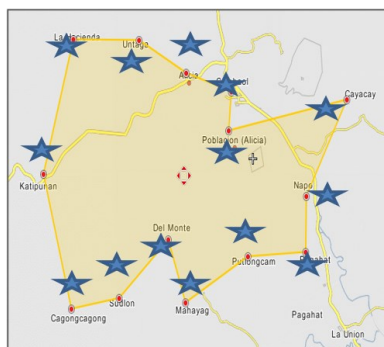
### 2.1 Research Design

The study is a quantitative-descriptive research design utilizing questionnaire as a method for data gathering. Modified standardized tools were used in measuring the primary variables (i.e., level of moral intelligence and stress tolerance). In measuring the independent variable, the Moral Competency Inventory (MCI) designed by Lennick and Kiel (2005) was used; the dependent variable is measured using Stress Tolerance Scale of Simons and Gaher (2005). Previous reliability and validity testing confirmed the consistency, dependability and relevance of these instruments.

### 2.2 Environment and Participants

The target respondents for the study were the elementary school teachers and school heads of elementary schools in District of Alicia, Bohol, Philippines during the school year 2019-2020. The location is the municipality of Alicia in the province of Bohol which composed of 15 barangays and about 103 kilometers away from the capital city of Tagbilaran. The map of Alicia, Bohol, Philippines was presented in figure 1.

There were a total of one hundred seventy six (160) identified public elementary school teachers and sixteen (16) school heads in Alicia district broken down as seventeen (17) male- respondents and one hundred fifty-nine (159) female- respondents subjected in this study.



★ Locale of the study  
Figure 1. Map of Alicia, Philippines

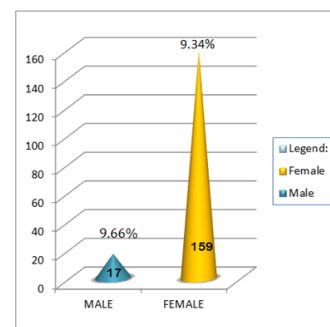


Figure 2. Distribution of Respondents

The researcher utilized a modified questionnaire adapted from Lennick and Kiel (2005) on Moral Competency Inventory (MCI) which composed of 37 items; the dependent variable is measured using Stress Tolerance Scale of Simons and Gaher (2005) comprises of 15 items; The 30-item questionnaire was developed by the Department of Education (DepEd) during its implementation of the Results-Based Performance Management System (RPMS). This instrument has 6 core indicators, namely: self-management; professionalism and ethics, result focus, teamwork, service orientation, and innovation. The profile of the respondents was also gathered. The said questionnaire was pilot tested in order to validate the content statements and its reliability through the assessment of the statistician.

The results were tabulated, interpreted and discussed as basis in analyzing and interpreting the data. The researchers used percentage, weighted mean, Chi – square and Spearman Coefficient of Correlation.

## RESULTS AND DISCUSSIONS

This study seeks to evaluate the level of moral intelligence and stress tolerance in relation to teachers' behavioral competency in the public elementary school of Alicia, Bohol, Philippines.

**Table 1. Profile of the Respondents**

| Profile                                   | Frequency | Percentage (%) | Rank |
|---|-----------|----------------|------|
| <b>1.1 Age</b>                            |           |                |      |
| 21-30 years old                           | 38        | 23.75          | 2    |
| 31-40 years old                           | 57        | 35.62          | 1    |
| 41-50 years old                           | 32        | 20             | 3    |
| 51-60 years old                           | 31        | 19.38          | 4    |
| 61 years old and above                    | 2         | 1.25           | 5    |
| <b>Total</b>                              | 160       | 100%           |      |
| <b>1.2 Sex</b>                            |           |                |      |
| Male                                      | 7         | 4.38           | 2    |
| Female                                    | 153       | 95.63          | 1    |
| <b>Total</b>                              | 160       | 100%           |      |
| <b>1.3.Highest Educational Attainment</b> |           |                |      |
| Bachelor's Degree Holder                  | 45        | 28.13          | 2    |
| With units in Master's Degree             | 104       | 65             | 1    |
| Master's Degree Holder                    | 6         | 3.75           | 3    |
| With units in PhD/EdD                     | 5         | 3.13           | 4    |
| PhD/EdD Graduate                          | 0         | 0              | 5    |
| <b>Total</b>                              | 160       | 100%           |      |
| <b>1.4 Teaching Experience</b>            |           |                |      |
| 5 years and below                         | 46        | 28.75          | 1    |
| 6-10 years                                | 31        | 19.38          | 3    |
| 11-15 years                               | 33        | 20.63          | 2    |
| 16-20 years                               | 21        | 13.13          | 4.5  |
| 21-30 years                               | 21        | 13.13          | 4.5  |
| 31 years and above                        | 8         | 5              | 6    |
| <b>Total</b>                              | 160       | 100%           |      |
| <b>1.5 Grade Level Handled</b>            |           |                |      |
| Kinder                                    | 18        | 11.25          | 7    |
| Grade 1                                   | 22        | 13.75          | 5    |
| Grade 2                                   | 24        | 15             | 3    |
| Grade 3                                   | 21        | 13.13          | 6    |
| Grade 4                                   | 26        | 16.25          | 1.5  |
| Grade 5                                   | 23        | 14.38          | 4    |
| Grade 6                                   | 26        | 16.25          | 1.5  |
| <b>Total</b>                              | 160       | 100%           |      |

1.1 Age. Out of the one hundred sixty (160) teachers, thirty-eight (38) teachers belonged to the age of twenty-one to thirty years old; fifty – seven (57) teachers having the age of thirty-one to forty years old; thirty-two (32) teachers were forty-one to fifty years old; thirty- one (31) teachers were fifty-one to sixty years old; and two (2) children belonged to 61 and above years old respectively.

1.2. Sex. Seven (7) out of the one hundred sixty children (160) children were males while, there were one hundred fifty - three (153) female- respondents.

1.3 Highest Educational Attainment. Out of one hundred-sixty (160) teachers, forty-five (45) are bachelor's degree holder; one hundred-four (104) teachers with units in Master's Degree; six (6) teachers with Master's Degree; five (5) with units in PhD/EdD; and zero (0) PhD/EdD graduate.

1.4. Teaching Experience. Out of the three hundred sixty (160) respondents, forty (46) of them obtain 0-5 years of teaching experience; on the other hand, there are only eight (8) respondents with a teaching experience of 31 years and above. The results tell that most of the teachers are in their early years of service.

1.5. Grade Level. Out of one hundred sixty (160) respondents, Grade 4 and 6 have the most number of teachers and the least number of respondents are the Kindergarten teachers.

2. Teachers' level of moral intelligence. It shows clearly that teachers' moral intelligence is observed with an average weighted mean of 3.24. According to Clarcken (2010) on his paper entitled "Considering moral intelligence as part of a holistic education", that developing greater moral intelligence will result in individuals, schools and other social systems that are more healthy and positive

**Table 2. Respondents' Level of Moral Intelligence N= 176**

| Categories of Moral Intelligence | School Heads |                        | Peers       |                 | Teachers    |                 | Overall     |                 |      |
|----------------------------------|--------------|------------------------|-------------|-----------------|-------------|-----------------|-------------|-----------------|------|
|                                  | WM           | VI                     | WM          | VI              | WM          | VI              | WM          | VI              | Rank |
| 2.1 Integrity                    | 3.27         | HO                     | 3.11        | O               | 3.16        | O               | 3.18        | O               | 4    |
| 2.2 Responsibility               | 3.42         | HO                     | 3.20        | O               | 3.27        | HO              | 3.30        | HO              | 1    |
| 2.3 Compassion                   | 3.24         | O                      | 3.25        | HO              | 3.20        | O               | 3.23        | O               | 2.5  |
| 2.4 Forgiveness                  | 3.29         | HO                     | 3.21        | O               | 3.20        | O               | 3.23        | O               | 2.5  |
| <b>Average Weighted Mean</b>     | <b>3.31</b>  | <b>Highly Observed</b> | <b>3.21</b> | <b>Observed</b> | <b>3.19</b> | <b>Observed</b> | <b>3.24</b> | <b>Observed</b> |      |

Legend:

|              |                            |              |                            |
|--------------|----------------------------|--------------|----------------------------|
| Rating Scale | Verbal Interpretation (VI) | Rating Scale | Verbal Interpretation (VI) |
| 3.25 – 4.00  | Always (A)                 | 1.75 – 2.49  | Sometimes (S)              |
| 2.50 – 3.24  | Frequently (F)             | 1.00 – 1.74  | Not at All (NA)            |

The Teachers' level of Stress Tolerance. Teachers have high tolerance of stress with the average weighted mean of 3.13. It can be attested to the result of their peers with 3.12 interpreted as high tolerance of stress and with average weighted mean of 3.13 as high level of stress tolerance. It means teachers are not easily affected by the difficulties they encounter at work. A teacher high in stress tolerance can generally handle and even thrive high pressure situations and can be emotionally steady especially in disciplining pupils' behavior.

**Table 3. Respondents' Level of Stress Tolerance N<sub>1</sub>=160, N<sub>2</sub>=160**

| Statement   | Teachers |    |      | Peers |    |      | Overall |    |      |
|---|----------|----|------|-------|----|------|---------|----|------|
|   | WM       | VI | Rank | WM    | VI | Rank | WM      | VI | Rank |
| 1. I can bear the feeling of stressed or upset.                                     | 3.16     | H  | 6    | 3.18  | H  | 2    | 3.17    | H  | 2.5  |
| 2. I can handle feeling stressed or upset.  | 3.13     | H  | 10   | 3.14  | H  | 5    | 3.13    | H  | 7    |
| 3. I can tolerate being stressed or upset as well as most people.                   | 3.02     | H  | 13   | 3.09  | H  | 11.5 | 3.06    | H  | 14   |
| 4. When I feel stressed, I will not always think how bad I feel.                    | 3.01     | H  | 14   | 3.12  | H  | 7    | 3.07    | H  | 13   |
| 5. My feelings of stress are so intense but they won't completely take over me.     | 3.13     | H  | 10   | 3.10  | H  | 10   | 3.12    | H  | 10   |
| 6. When I feel stressed, I concentrate more on the benefits given on the situation. | 3.16     | H  | 6    | 3.11  | H  | 8.5  | 3.14    | H  | 5.5  |
| 7. When I feel stressed, is not a worse feeling for me.                             | 2.99     | H  | 15   | 3.23  | H  | 1    | 3.11    | H  | 11.5 |
| 8. My feelings of stress are acceptable.  | 3.16     | H  | 6    | 3.16  | H  | 3.5  | 3.16    | H  | 4    |
| 9. I manage to hold my stress feeling as much as I can in different situation.      | 3.22     | H  | 2    | 3.16  | H  | 3.5  | 3.19    | H  | 1    |
| 10. Being stressed is not a major ordeal for me.                                    | 3.03     | H  | 12   | 3.06  | H  | 14.5 | 3.05    | H  | 15   |
| 11. I make myself calm when I feel stressed.  | 3.18     | H  | 4    | 3.07  | H  | 13   | 3.13    | H  | 8    |
| 12. I consider stress feeling as motivation to improve myself.                      | 3.23     | H  | 1    | 3.11  | H  | 8.5  | 3.17    | H  | 2.5  |



|  |             |             |    |             |             |      |             |             |      |
|--|-------------|-------------|----|-------------|-------------|------|-------------|-------------|------|
| 13. I always do everything to avoid feeling stress when meeting deadlines.                   | 3.20        | H           | 3  | 3.06        | H           | 14.5 | 3.13        | H           | 9    |
| 14. I always find time to do paperwork requirements to avoid stress.                         | 3.13        | H           | 10 | 3.09        | H           | 11.5 | 3.11        | H           | 11.5 |
| 15. I do something immediately on correcting errors on implemented policies to avoid stress. | 3.14        | H           | 8  | 3.13        | H           | 6    | 3.14        | H           | 5.5  |
| <b>Average Weighted Mean</b>   | <b>3.13</b> | <b>High</b> |    | <b>3.12</b> | <b>High</b> |      | <b>3.13</b> | <b>High</b> |      |

Legend:

|              |                            |              |                            |
|--------------|----------------------------|--------------|----------------------------|
| Rating Scale | Verbal Interpretation (VI) | Rating Scale | Verbal Interpretation (VI) |
| 3.25 – 4.00  | Very High                  | 1.75 – 2.49  | Low                        |
| 2.50 – 3.24  | High                       | 1.00 – 1.74  | Very Low                   |

4. Teachers' Behavioral Competencies. Results shown that teachers' behavioral competencies got the overall weighted mean of 4.14, interpreted as 'Consistently Demonstrates'. The implication is that teacher-respondents are behaviourally competent. They consistently demonstrate the duties and responsibilities expected of them as teachers in the Department of Education. Lind (2006) emphasizes competence as a skill that can be acquired which means moral competence can be taught and learned. Lind suggests focusing on morality as capacity or ability rather than as a personal value or attitude.

**Table 4. Respondents' Behavioral Competencies N=160**

| Core Behavioral Competencies | Rating      | Verbal Interpretation            | Rank |
|------------------------------|-------------|----------------------------------|------|
| Self- Management             | 4.13        | Consistently Demonstrates        | 3    |
| Professionalism and Ethics   | 4.24        | Role Model                       | 1    |
| Result Focus                 | 4.08        | Consistently Demonstrates        | 5    |
| Teamwork                     | 4.23        | Role Model                       | 2    |
| Service and Orientation      | 4.12        | Consistently Demonstrates        | 4    |
| Innovation                   | 4.06        | Consistently Demonstrates        | 6    |
| <b>Average</b>               | <b>4.14</b> | <b>Consistently Demonstrates</b> |      |

Legend:

|              |                               |
|--------------|-------------------------------|
| Rating Scale | Verbal Interpretation         |
| 4.20 – 5.00  | Role Model                    |
| 3.40 – 4.19  | Consistently Demonstrates     |
| 2.60 – 3.39  | Most of the Time Demonstrates |
| 1.80 – 2.59  | Sometimes Demonstrates        |
| 1.00 – 1.79  | Rarely Demonstrates           |

The relationship between the Teachers' Profile and Moral Intelligence. The result revealed that there no sufficient evidence of a significant relationship between the teachers' moral intelligence and their profile in terms of age, sex, highest educational attainment and teaching experience since the computed correlation value of 12.756 at 8 degrees of freedom, 5.926 at 2 degrees of freedom, 1.426 at 6 degrees of freedom and 9.319 at 10 degrees of freedom, respectively with the corresponding p-value of 0.121, 0.052, 0.964, and 0.502 which are larger than 0.05 level of significance, thus failed to reject the null hypothesis. This denotes that the respondents were morally intelligent in handling difficult situations regardless of their age, sex, highest educational attainment and teaching experience and their profile does not influence to their moral intelligence.

**Table 5.1 Relationship Between the Teachers' Profile and Moral Intelligence N=160**

| Moral Intelligence and... Profile | X <sup>2</sup> | df | p-value | Interpretation  | Decision            |
|-----------------------------------|----------------|----|---------|-----------------|---------------------|
| Age                               | 12.756         | 8  | 0.121   | Not Significant | Failed to Reject Ho |
| Sex                               | 5.926          | 2  | 0.052   | Not Significant | Failed to Reject Ho |
| Highest Educational Attainment    | 1.426          | 6  | 0.964   | Not Significant | Failed to Reject Ho |
| Teaching Experience               | 9.319          | 10 | 0.502   | Not Significant | Failed to Reject Ho |

5.2 discloses the test of relationship between the teachers' stress tolerance and their demographic profile in terms of age, sex, highest educational attainment and teaching experience. The result described that there is no sufficient evidence of a significant relationship between the teachers' stress tolerance and their profile in terms of age, sex, highest educational attainment and teaching experience since the com-

puted correlation value of 9.937 at 12 degrees of freedom, 1.723 at 3 degrees of freedom, 3.929 at 9 degrees of freedom and 11.211 at 15 degrees of freedom, respectively with the corresponding p-value of 0.622, 0.632, 0.916, and 0.737 which are larger than 0.05 level of significance, thus failed to reject the null hypothesis. This signifies that teachers have high tolerance of stress despite of their age, sex, highest educational attainment and teaching experience. Further, their profile does not influence to their stress acceptance.

**Table 5.2 Relationship Between the Teachers' Profile and Stress Tolerance N=160**

| Stress Tolerance and...<br>Profile | X <sup>2</sup> | df | p-value | Interpretation  | Decision            |
|------------------------------------|----------------|----|---------|-----------------|---------------------|
| Age                                | 9.937          | 12 | 0.622   | Not Significant | Failed to Reject Ho |
| Sex                                | 1.723          | 3  | 0.632   | Not Significant | Failed to Reject Ho |
| Highest Educational Attainment     | 3.929          | 9  | 0.916   | Not Significant | Failed to Reject Ho |
| Teaching Experience                | 11.211         | 15 | 0.737   | Not Significant | Failed to Reject Ho |

Table 6 shows the test of relationship between the teachers' moral intelligence and stress tolerance. The result reveals that there is a significant relationship between the teachers' moral intelligence and stress tolerance since the computed correlation value of 0.588 with the p-value of <0.001 which is lesser than 0.05 level of significance, thus the null hypothesis is rejected. This denotes that moral intelligence is important for teachers in order for them to handle stress at work.

**Table 6. Relationship Between the Teachers' Moral Intelligence and Stress Tolerance N=160**

| Moral Intelligence and... | r     | p-value | Interpretation | Decision  |
|---------------------------|-------|---------|----------------|-----------|
| Stress Tolerance          | 0.588 | <0.001  | Significant    | Reject Ho |

*\*Correlation is significant at 0.05 level (2-tailed)*

Table 7.1 depicts the test of relationship between the teachers' behavioral competencies and moral intelligence. The result discloses that there is a significant relationship between the teachers' behavioral competencies and moral intelligence since the computed correlation value of 0.230 with the p-value of 0.004 which is lesser than 0.05 level of significance thus the null hypothesis is rejected. This means that behaviorally competent teachers are morally intelligent. It depends on how the teachers react to the situation under pressure, either fight or let it go.

**Table 7.1 Relationship Between the Teachers' Behavioral Competencies and Moral Intelligence N=160**

| Behavioral Competence and... | r     | p-value | Interpretation | Decision  |
|------------------------------|-------|---------|----------------|-----------|
| Moral Intelligence           | 0.230 | 0.004   | Significant    | Reject Ho |

7.2 portrays the test of relationship between the teachers' behavioral competencies and stress tolerance. The result shows that there is no significant relationship between the teachers' behavioral competencies and stress tolerance since the computed correlation value of 0.096 with the p-value of 0.231, is greater than 0.05 level of significance, thus, fails to reject the null hypothesis. This infers that behavioral competency of teachers does not affect their level of stress tolerance.

**Table 7.2 Relationship Between the Teachers' Behavioral Competencies and Stress Tolerance N = 160**

| Behavioral Competence and... | r     | p-value | Interpretation  | Decision            |
|------------------------------|-------|---------|-----------------|---------------------|
| Stress Tolerance             | 0.096 | 0.231   | Not Significant | Failed to Reject Ho |

*\*Correlation is significant at 0.05 level (2-tailed)*

## CONCLUSIONS

Based on findings, this study concluded that the teachers' moral intelligence in the aspects of responsibility is highly observed. Furthermore, teachers have high level in stress tolerance that can generally handle and even able to cope high pressure situations. Finally, behaviorally competent teachers were morally intelligent.

## RECOMMENDATIONS

Based from the results of this study, the researchers came-up with the following recommendations. There should be an action plan implementation in school in order to help teachers enhance their moral intelligence and stress tolerance; a seminars/trainings, reading informative journal an instructional videos to heighten teachers' moral intelligence in all aspects.

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# **CONFLICT MANAGEMENT SKILLS OF PUBLIC ELEMENTARY SCHOOL HEADS AND TEACHERS: ITS IMPLICATION TO SCHOOL CLIMATE**

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## **ABSTRACT**

**The study aimed to determine the conflict management skills of public elementary school heads and teachers in Ubay II District and Its Implication to School Climate. This study utilized the descriptive type of research in determining the management skills of public elementary school heads with 12 Elementary School Heads and 146 Elementary Teachers respondents. The researcher achieved the following findings: There is no sufficient evidence of a significant correlation between the school administrators' conflict management skills and the overall school climate; there is a sufficient evidence of a significant difference between the assessments of the respondents on the school administrators' conflict management skills; there is no significant difference between the respondents' assessment on the school climate; there is no sufficient evidence of a significant correlation between the school administrators' conflict management skills and the overall school climate. The school personnel always feel safe inside the school campus wherein classrooms and other school facilities are well maintained and in good condition thus provides an overall physical environment clean, organized and safe which promotes encouraging school climate even though conflict management skills where oftentimes manifested by their school heads. However, it is very notable that the school heads involve and collaborate with their subordinates in handling conflicts in their schools.**

*Keywords: Conflict Management Skills, Climate, School Head, Teacher, School*

## **INTRODUCTION**

Education drives a person towards the achievement of success and progress, not just for himself, but more so for his society and of the world. It is both art and science, which requires creativity and systematic procedural execution and acquisition among educator and learner.

Education plays also an important role for nation's character and personality development. It is the primary means of ensuring the attainment of goals for social prosperity, unity, freedom and justice to prepare every Filipino child intellectually, physically and morally. It is then safe to say that every learning institution needs to produce learners to be an educated individual towards being an educated who are productive and responsible citizen to the society.

With this, the Department of Education is committed to provide a quality system of public and private education with the help of teachers who can help students develop their abilities, attitudes and skills for them to function effectively in a rapidly changing environment.

For the schools to be more effective, it is important to develop leaders that will best suite in an organization where a culture has been established. With this, the leader can exercise his power to lead the organization through school reform and manage the problems within the institution. Problems in education are worldwide. This impression was perceived from the statement of Hanson A., Dustin A. and Jus-

tin M. (2013) who attempted to justify the evolvement of educational reforms that have been actively pursued for several decades; that activity now has a heightened sense of urgency.

Accordingly, to Hanson A., Dustin A. and Justin M. (2013), the call for reform comes from many quarters. They also claimed that educators themselves have pronounced that schools performed a poor job in engaging majority of students to serious learning.

The foregoing statement about the poor job of Philippine schools in learning also holds true in other countries as reported by the Joint Congressional Report on Education contained in Making Education Work (2011). The problem that the Department of Education has been trying to resolve through the years includes the decreasing level of performance of elementary school children in practically all subjects, especially in mathematics, science and reading.

Such worldwide profile of poor performance of schools demands increase and acknowledgement of need for change toward increased management productivity. Consequently, school administrators are called upon to give rise to launching new thrust and programs for high performance. Evidently, the educational system the world over has responded to the call to a certain extent, and the Philippines are not an exception.

Most of the schools in Ubay II District experienced conflict in their organizations and how the school head managed the school is indispensable. Conflict arises because of the different point of views and opinions of others. Most teachers are not willing to admit errors and they do not want to be corrected by others.

In some schools in Ubay II District, teachers are not in good relationship with each other due to different reasons. Unfortunately, they are just pretending that they are in good terms as if nothing bad happens. But the truth is that they create tensions, which are not beneficial to the school.

From this perspective, the researcher is prompted to assess the conflict management skills of public elementary school heads and teachers in Ubay II district and its implication to school climate in the S.Y. 2019 – 2020.

## LITERATURE REVIEW

Managing people is the heart and essence of being a manager. It concerns all activities relating to human in the organization.

The importance of human resource management has increased these days because management can achieve the organizational objectives only with the cooperation of the people working in the organization. Therefore, creating and maintaining a motivated workforce is the central responsibility of management everywhere. Management of human resources is a very challenging job. It is not only concerned with managing people at work but also with managing a social dynamic nature of human element. Human resources comprise a large number of individuals of different sex, age-group, socio-religious groups and of different educational backgrounds not only similar behavior patterns and characteristic to certain degree, but also, they have many dissimilarities.

According to Haslinda (2012), human resource is organizations' greatest assets because without it, everyday activities such as managing public service, communication and dealing with customers could not be completed. This shows that the employees and the potential they possess are key drivers of the organizations' success. Moreover, Kebede and Sambasivam (2013), in their findings indicated that organizational change impacts not only the organization's activities but also employees' knowledge and competencies.

Similarly, as noted by Haslinda (2012), in order to maximize organizational effectiveness and to ensure the employees' potential, capabilities and talents must be developed and updated. These passages imply the essentiality of human resource with the aid of individual's capabilities and proficiencies on various undertakings as it impacts the overall development of any organization.

Human resource management (HRM) is an approach to the management of people, based on four fundamental principles. First, human resources are the most important assets an organization has and their effective management is the key to its success. Second, this success is most likely to be achieved if the personnel policies and procedures of the enterprises are closely linked with, and make a major contribution to, the achievement of corporate objectives and strategic plans. Third, the corporate culture and the values, organizational climate and managerial behavior that emanate from that culture will exert a

major influence on the achievement of excellence. This culture must, therefore, be managed which means that organizational values may need to be changed or reinforced, and that continuous effort, starting from the top, will be required to get them accepted and acted upon. Finally, HRM is concerned with integration-getting all the members of the organization involved and working together with a sense of common purpose.

As opined by Fisher, (2011) “Human Resource Management involves all management decisions and practices that directly affect or influence the people, or human resources, who work for the organization”. Human resource management is a strategic and coherent approach to the management of an organization's most valued assets- the people working there who individually and collectively contribute to the achievement of its goals.

Furthermore, according to Brooks (2011), in order to be a successful manager, one must possess effective communication skills. The nature and patterns of communication exhibited by individuals are ascertained by cultural and social values. Doing business across cultures and managing in a multicultural environment, however, can raise difficulties and conflicts due to cultural differences.

## **OBJECTIVES**

This study aimed to determine the conflict management skills of public elementary school heads and teachers in Ubay II district and its implication to school climate during the SY 2019-2020.

Specifically, it sought to answer the following:

1. What is the assessment of the respondents on the conflict management skills?
2. What is the assessment of the respondents on school climate in terms of school safety; and physical environment?
3. Is there a significant correlation between the conflict management skills and school climate?
4. Is there a significant difference between the assessments of the respondents on conflict management skills; and school climate?

## **RESEARCH METHODOLOGY**

This study utilized the descriptive type of research in determining the management skills of public elementary school heads and teachers. This type of research is the most appropriate and most fitting in describing and interpreting the administrative and supervisory competence of school heads in terms of conflict management skills under study.

The Municipality of Ubay in Bohol, being the locale of the study, is located in the Northeastern part of the province. Specifically, the study conducted in the public elementary schools of Ubay II district namely: Biabas, Benliw, Cagting, Cuya, Guintaboan, Imelda, Juagdan, San Vicente, Sinandigan, Tipolo, Tintinan and Union. The participants of this study are the 12 Elementary School Heads and 146 Elementary School Teachers in Ubay II District. All in all, there were a total of 158 respondents.

In gathering the data for the study, the researchers utilized the descriptive survey design using a modified questionnaire and were personally distributed to the participants.

The researcher utilized a modified survey questionnaire adapted from the study of Henning (2003). The first part of the questionnaire was designed to identify the profile of the school heads in terms of age, sex, civil status, highest educational attainment, present position and year in service. Conflict management skills of school heads and teachers in terms of: organizational conflicts cooperativeness, collaborating, compromising, assertiveness, competing, dictating, withdrawal, avoiding and negotiating; the school climate of school heads and teachers were designed by Thomasson (2006) comprise with the following: school safety and physical environment.

The scoring and description of the responses on the Conflict Management Skills were arranged to the use of five points scale. On a scale of 1-5, the respondents can rate the level of Conflict Management Skills. The rating scale and distribution of questionnaire were categorized as Always, Oftentimes, Sometimes, Seldom, and Never, with rating scale of 5, 4, 3, 2 and 1.

## RESULTS AND DISCUSSIONS

The findings are herein presented and analyzed in light of the various aspects of the research problem.

**Table 1. Respondents' Assessment in the Conflict Management Skills of Public Elementary School Heads and Teachers**  
N1 = 12; N2 = 146

| Aspects                      | School Heads |                    | Teachers    |                    | Overall     |                    |
|------------------------------|--------------|--------------------|-------------|--------------------|-------------|--------------------|
|                              | WM           | VI                 | WM          | VI                 | WM          | VI                 |
| <b>3.1 Cooperativeness</b>   |              |                    |             |                    |             |                    |
| collaborating                | 4.57         | A                  | 4.42        | A                  | 4.49        | A                  |
| compromising                 | 4.27         | A                  | 4.09        | O                  | 4.18        | O                  |
| <b>Average Weighted Mean</b> | <b>4.42</b>  | <b>Always</b>      | <b>4.26</b> | <b>Always</b>      | <b>4.34</b> | <b>Al-ways</b>     |
| <b>3.2 Assertiveness</b>     |              |                    |             |                    |             |                    |
| competing                    | 4.2          | A                  | 3.94        | O                  | 4.07        | O                  |
| dictating                    | 4.4          | A                  | 4.25        | A                  | 4.32        | A                  |
| <b>Average Weighted Mean</b> | <b>4.30</b>  | <b>Always</b>      | <b>4.09</b> | <b>Often times</b> | <b>4.20</b> | <b>Al-ways</b>     |
| <b>3.3 Withdrawal</b>        |              |                    |             |                    |             |                    |
| avoiding                     | 4.05         | O                  | 4           | O                  | 4.03        | O                  |
| negotiating                  | 3.85         | O                  | 3.9         | O                  | 3.88        | O                  |
| <b>Average Weighted Mean</b> | <b>3.95</b>  | <b>Often times</b> | <b>3.95</b> | <b>Often times</b> | <b>3.95</b> | <b>Often times</b> |
| <b>Overall Weighted Mean</b> | <b>4.22</b>  | <b>Always</b>      | <b>4.11</b> | <b>Often times</b> | <b>4.16</b> | <b>Often times</b> |

Legend:  
**Rating Scale**      **Verbal Interpretation (VI)**      **Weighted Mean (WM)**  
 4.20 – 5.00          Always (A)  
 3.40 – 4.19          Oftentimes (O)  
 2.60 – 3.39          Sometimes (SO)  
 1.80 – 2.59          Seldom (S)  
 1.00 – 1.79          Never (N)

The table 1 presents the Conflict Management Skills of Public Elementary School Heads and Teachers. In the aspect of cooperativeness, collaborating got the highest weighted mean of 4.49 with a verbal interpretation of “Always” while compromising has a weighted mean of 4.18 interpreted as “Always”.

In terms of assertiveness, dictating got the highest weighted mean of 4.32 interpreted as “Always” while competing got a weighted mean of 4.07 with a verbal interpretation of “Oftentimes”.

As to withdrawal, avoiding and negotiating got a weighted mean of 4.03 and 3.88 respectively with both verbal interpretations “Oftentimes”

Overall, in terms of cooperativeness and assertiveness, both got a weighted mean of 4.34 and 4.20 with a verbal interpretation of “Always” while withdrawal got an overall weighted mean of 3.95 interpreted as “Oftentimes”. This implies that majority of the school heads involve and collaborate with their subordinates in handling conflicts in their schools. This supported with the study conducted by Somech (2018) indicated that school- staff teams that learned to appreciate and make constructive use of the different perspectives and experiences may promote team effectiveness.

Moreover, Ladeño (2014) found out in his study that majority of the administrators considered integrating as one of the most extremely and highly desirable style in conflict management. School climate is a leading factor in explaining student learning and achievement. Less work has explored the impact of both staff and student perceptions of school climate raising interesting questions about whether staff school climate experiences can add “value” to students' achievement.

Here in table 2, In terms of school safety, it has an average weighted mean of 4.27 with a verbal interpretation of “Always” commonly observed by the school heads and teachers respondents. While physical environment has an average weighted mean of 4.40 with verbal interpretation of “Always” observe by the school heads and teachers respondents.

Finally, for the school head respondents, the overall weighted mean is 4.31 with a verbal interpretation of “Always”. For the teacher respondents, the overall weighted mean is 4.36 with a verbal interpretation of “Always”. And overall, the overall weighted mean is 4.33 with a verbal interpretation of

“Always”. This means that both teachers and school heads of the school are able to cooperate with each other regarding on how they will maintain harmonious relationship in their school. Both group of respondents are comfortable and secure on their school.

**Table 2. Assessments of the Respondents on School Climate**  
N1 = 12; N2 = 146

| Statement                               | School Heads |               |      | Teachers    |               |      | Overall     |               |      |
|---|--------------|---------------|------|-------------|---------------|------|-------------|---------------|------|
|   | WM           | VI            | Rank | WM          | VI            | Rank | WM          | VI            | Rank |
| <b>4.1 School Safety</b>                |              |               |      |             |               |      |             |               |      |
| 1. I feel safe at our school            | 4.42         | A             | 1    | 4.26        | A             | 3    | 4.34        | A             | 2    |
| 2. I have been concerned                | 4.17         | O             | 4    | 4.58        | A             | 1    | 4.37        | A             | 1    |
| 3. I report unsafe/danger               | 4.33         | A             | 2    | 4.06        | O             | 5    | 4.20        | A             | 5    |
| 4. I feel safe when entering            | 4.25         | A             | 3    | 4.19        | O             | 4    | 4.22        | A             | 3    |
| 5. I feel safe when leaving             | 4.08         | O             | 5    | 4.33        | A             | 2    | 4.21        | A             | 4    |
| <b>Average Weighted Mean</b>            | <b>4.25</b>  | <b>Always</b> |      | <b>4.28</b> | <b>Always</b> |      | <b>4.27</b> | <b>Always</b> |      |
| <b>4.2 Physical Environment</b>         |              |               |      |             |               |      |             |               |      |
| 1. School well-maintained               | 4.50         | A             | 1.5  | 4.33        | A             | 4    | 4.41        | A             | 3    |
| 2. I.Ms are up to date                  | 4.17         | O             | 5    | 4.70        | A             | 1    | 4.43        | A             | 2    |
| 3. Teachers keep classroom clean        | 4.25         | A             | 4    | 4.36        | A             | 3    | 4.30        | A             | 5    |
| 4. Teachers keep school building clean  | 4.50         | A             | 1.5  | 4.19        | O             | 5    | 4.35        | A             | 4    |
| 5. Make effort to keep facilities clean | 4.42         | A             | 3    | 4.57        | A             | 2    | 4.49        | A             | 1    |
| <b>Average Weighted Mean</b>            | <b>4.37</b>  | <b>Always</b> |      | <b>4.43</b> | <b>Always</b> |      | <b>4.40</b> | <b>Always</b> |      |
| <b>Overall Weighted Mean</b>            | <b>4.31</b>  | <b>Always</b> |      | <b>4.36</b> | <b>Always</b> |      | <b>4.33</b> | <b>Always</b> |      |

Legend:  
 Rating Scale Verbal Interpretation (VI)  
 4.20 – 5.00 Always (A)  
 3.40 – 4.19 Oftentimes (O)  
 2.60 – 3.39 Sometimes (SO)  
 1.80 – 2.59 Seldom (S)  
 1.00 – 1.79 Never (N)

Table 3 shows the test of correlation between the school administrators’ conflict management skills and the school climate in terms of school safety and physical environment. The result revealed that there is no sufficient evidence of a significant association between the school administrators’ conflict management skills and the school safety since the computed correlation value of 0.010 with a p-value of 0.900 which is larger than 0.05 level of significance, thus failed to reject the null hypothesis.

**Table 3. Correlation Between the School Administrators’ Conflict Management Skills and the School Climate**  
N = 158

| Conflict Management Skills and.. | r     | p-value | Interpretation  | Decision            |
|----------------------------------|-------|---------|-----------------|---------------------|
| School Safety                    | 0.010 | 0.900   | Not Significant | Failed to Reject Ho |
| Physical Environment             | 0.145 | 0.068   | Not Significant | Failed to Reject ho |
| Overall School Climate           | 0.113 | 0.158   | Not Significant | Failed to Reject ho |

\*Correlation is significant at 0.05 level (2-tailed)

Likewise, there is no significant correlation between the school administrators’ conflict management skills and the school’s physical environment since the computed correlation value of 0.145 with a p-value of 0.068 which is larger than 0.05 level of significance, thus failed to reject the null hypothesis.

Moreover, there is no sufficient evidence of a significant correlation between the school administrators’ conflict management skills and the overall school climate since the computed correlation value of 0.113 with a p-value of 0.158 which is larger than 0.05 level of significance, thus failed to reject the null hypothesis.

**Table 4 Difference Between the Respondents’ Assessment on the School Administrators’ Conflict Management Skills and the School Climate**  
N = 158

| Variables                  | p-value | Interpretation  | Decision            |
|----------------------------|---------|-----------------|---------------------|
| Conflict Management Skills | 0.018   | Significant     | Reject Ho           |
| School Climate             | 0.526   | Not Significant | Failed to Reject ho |

\*Correlation is significant at 0.05 level (2-tailed)



Table 4 illustrates the test of difference between the respondents' assessment on the school administrators' conflict management skills and the school climate. The result disclosed that there is a sufficient evidence of a significant difference between the assessment of the respondents on the school administrators' conflict management skills since the computed p-value of 0.018 is lesser than 0.05 level of significance, hence the null hypothesis is rejected.

However, there is no significant difference between the respondents' assessment on the school climate since the computed p-value of 0.526 is larger than the preset level of significance 0.05, thus failed to reject the null hypothesis.

This shows that in handling conflicts, school heads usually try to satisfy the expectations of his/her teachers, thus, giving in to their suggestions and opinions. According to Friedman, Tidd, Currall and Tsai (2010) that this style provides an easy way to settle disputes. One party simply gives in to the other party, so that conflict is reduced. However, this result is achieved without recognizing the interests of the person who is obliging, and consequently his or her own issues are not resolved, and little energy has been invested into the dispute to find optimal or creative solutions. Obliging may resolve the dispute for the moment, but collective resources have not been expanded through creative problem-solving, and one side's problems may still remain.

## CONCLUSION

Based on the thorough analysis and findings of the study, the researchers concluded that there is no sufficient evidence of a significant correlation between the school administrators' conflict management skills and the overall school climate. The school personnel of all public elementary schools in Ubay II District always feel safe inside the school campus wherein classrooms and other school facilities are well maintained and in good condition thus provides an overall physical environment clean, organized and safe which promotes encouraging school climate even though conflict management skills were oftentimes manifested by their school heads. However, it is very notable that the school heads involve and collaborate with their subordinates in handling conflicts in their schools.

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# FACTORS AFFECTING ACADEMIC HONESTY IN DISTANCE EDUCATION IN RELATION TO STUDENTS' ACADEMIC PERFORMANCE

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## ABSTRACT

The main purpose of this study was to determine the relationship between academic performance and honesty in distance education of students in selected public schools of Candijay, Alicia, Mabini, Anda, and Guindulman districts during School Year 2021-2022. The researchers used the descriptive and survey method. The locale of the study was the five (5) zone districts of the Department of Education in the eastern part of the province of Bohol namely: Candijay, Alicia, Mabini, Anda and Guindulman (CAMAG) with 188 selected students and 43 selected teachers participated in this study. The researcher adopted and modified the questionnaire. Stratified sampling technique was used by the researcher in selecting the respondents. The design of this study was a quantitative research design. The retrieved data were tallied, tabulated and subjected to descriptive and inferential statistics for the purpose of analysis and interpretation. The result revealed that there is a significant relationship between the students' academic performance and their profile in terms of sex. However, there is no significant relationship between the students' academic performance and their profile in terms of age and religion. On the relationship between the students' academic performance and perceived factors affecting academic honesty as to individual influence and social influence, found no significant. Therefore, the researchers concluded that age and religion of the students has nothing to do with the performance of the students, however, the success of academic performance may be influenced by their sex. Further, the academic performance of the students was not affected by the individual and social factors on academic honesty.

*Keywords: Academic honesty, Academic performance, Distance education*

## INTRODUCTION

Academic honesty becomes an issue as the pandemic challenges quality education received by the students. Academic honesty is the foundation to empower and promote learning, and conveys original thinking and properly attributes ideas. Fairness and accuracy is a challenge that a country is facing in assessing learners' work and output in distance education mode of learning (Brazel, 2020). There are factors that affect students in academic honesty. Academic dishonesty happens to anyone especially to the students who are experiencing peer pressure, fear of failing grades, family expectations, financial pressure, and poor study skill. In addition, the group where learners belong affects academic behavior. It is supported in the study of Gross (2012) academic dishonesty is social rather than individual phenomenon.

Academic achievement is the outcome that tells if the goal of an institution was achieved. Among the various influencing factors, an important factor in academic achievement of the learners is having a desirable academic learning behavior. These include choices of learners, efforts in learning, and persistence (Rogel, 2012). Learning styles and behavioral choices of the students has a significant correlation to their academic performance (Ralph, 2010).

In the western part of the world, academic dishonesty has been a concern and problems as indicated in the statistics. Some forms of academic dishonesty were admitted by the medical school students in Europe which is composed of 97% which means higher percentage of doing such dishonesty (Taradi,

Taradi, & Dogas, 2012). In America, there is an exam held at the prominent university where 125 was caught cheating out of 250 students of the total class (Murphy, 2013). In addition, there is a study in the United States which researchers found that within the previous six months, 57% of the total students had cheated (Hensley, Kirkpatrick, & Burgoon, 2013).

In the Philippines, academic dishonesty becomes prevalent. Dishonest academic behaviors of the learners are the result of external and internal motivation. Societal expectations from learners' parents, peers and others motivate learners in getting grades and passing tests in school by any means to meet the expectations made by the people around them and to live according to their expectations despite of inability of students to avoid the feeling of self-pity and rejection. It was found out in the study of Balbuena and Lamela (2015) that in order to get better grades, learners collaborate and share answers with each other. Furthermore, teachers teaching strategies and techniques affect academic dishonesty. Learners' poor understanding of the subject matter motivates in academic dishonesty practice.

In the local setting, academic honesty was encouraged by the teachers even during face to face classroom setting and now in distance education. The Department of Education reminds to have the culture of academic integrity to truly learn from the modules. However, different issues arise from the society. Answering modules was become a business in social media. In addition, parents are the one who answers instead of guiding and scaffolding.

The different cases mentioned above motivate the researcher to conduct a study about academic honesty in distance education in relation to the academic achievement of the students. The findings of this study may serve as the bases to give a solution if academic misconduct exists and to help the learners, teachers and other stakeholders in building academic honesty as culture.

## LITERATURE REVIEW

In an educational institution over the world, academic honesty is important and crucial as communication in the learning process of the learners. Maintaining academic honesty is vital in all levels of education. Academic honesty is explained by (Marquette University, 2005) as cited in the study of (Kapur, 2018) as working academically in all school matters with all sincerity, honesty and truthfulness.

Demographic characteristics influence academic honesty of students. The study found that cheating in younger students is more likely to happen compared older students. Distance education demands greater maturity because of the absence of teachers unlike face to face education. Modular distance education is more appropriate to students with maturity to learn on their own. Learners are able to accept greater responsibility and able to control their own learning (French, 2015).

Time pressure influences the decision making of every individual. If the individual is experiencing time pressure, there will be a certain psychological reactions will happen next (Beldona, 2010). Time pressures induce individual emotional changes when an individual experience with a time-limited context which in turns affect the individual's perception and decision. In the study of Levav (2009) as cited in the study of Liu (2020) found and suggested on how to respond time pressure in three ways: First, when an individual is under time pressure, will look something that speed up the processing of information. The possible consequences of misconduct in academic can be ignored by the students. Second, an individual who are experiencing time pressure results anxiety. The feeling of completing the task is not enough. Individual with high anxiety reduces the quality of making decisions that leads to possibility in making unethical decisions. Third, is under time pressure there is a change of decision making. To relieve students' time pressure, they choose to do academic misconduct even this decision is high-risk. In the study of Jones (2011) it was found out that student commit academic dishonesty because of no time or too many obligations.

Peer pressure as defined by Jones (2010) is the ability of people from same class or age to influence another of same age or class. Peer pressure exerts force to influence the ideas, values and behaviors either positively or negatively. The negative behavior, urge in engaging undesired actions and decisions of an individual is the result of the pressure within the group (Dumas, Ellis, & Wolfe, 2012). In the study of Lesia & Hutapea (2015) results indicated that the participant with higher peer pressure had more significant to commits more academic misconduct. It is suggested from the study that an individual with peer who are tolerating cheating increases individual's dishonesty in academic as well. The students believe

that it is part of the norms since everyone is doing. Students have the mindset that when the peers and classmates are doing the same no one will report such unethical action (Quintos, 2017).

Fear of failing the examination makes the students to doubt and anxious. Students experiencing the same feeling are more likely neglect academic honesty. Students desires of getting higher grades and ensures academic achievement tend to cheat. A study of O'Connor (2015) it become trend for the student behavior that seems to indicate a desire to short-circuit the learning process. Another study suggests these habits and attitudes can be a self-deception about true education if cheating is taken just to achieve the desired grades (Gino & Ariely, 2012).

Gorman (2010) said that in fulfilling the goal of the students, students' looks different ways. Students work to achieve the fulfillment of learning and develop their potential to achieve more.

Bandura's Social Learning Theory (1989) stated that people are able to do self-examination. Moreover, emotions, thoughts, and actions of an individual are able to be controlled. Self-regulation is a way in controlling human behavior. People acquire behavior by observing others. Self-observation, judgment, and response are the processes of self-regulation. In the process of self-observation, from the word itself, it is an observation of individuals' own actions and behavior. Next is the judgment in which the process is to compare what is being observed to the set of norms. After judgment is the self-response. The response is depending on the comparison to the set standards and the behavior observed. Students tend to imitate such behavior they are observed and compare to the society, however, if the students grow, the standards on how we judge ourselves might change. Once individual ethical standards are in proper pace, behavior of the students will be guided. Self-regulation can correct academic misconduct.

## **STATEMENT OF THE PROBLEM**

The main purpose of this study was to find out the respondents' perception on the factors that affect academic honesty on distance education in relation to students' academic performance of selected Grade 11 students of public high schools in Candijay, Alicia, Mabini, Anda and Guindulman during the School Year 2021-2022.

Specifically, it aimed to answer the following questions:

1. What is the profile of the student's in terms of age; sex; academic performance; and religion?
2. What is the perception of the respondents on factors that affect student's academic honesty?
3. Is there a significant relationship between the students' academic performance and their profile?
4. Is there a significant relationship between the students' academic performance and the perceived factors affecting academic honesty?

## **RESEARCH METHODOLOGY**

This study used the descriptive-correlational and survey method. A stratified sampling technique was used by the researcher in selecting the respondents. The researcher collect data through survey-based with the aid of questionnaire about a specific topic.

These locales of the study were the selected public high schools in five (5) zone districts under the Department of Education in the municipality of Candijay, Alicia, Mabini, Anda and Guindulman (CAMAG). These localities are located in the eastern part of the province of Bohol.

There were 188 selected students and 43 selected teachers participated in conducting this study as respondents. The identified big student population included in this study namely: Candijay National High School (District of Candijay), Alicia Technical Vocational (District of Alicia), San Roque High School (District of Mabini), Candabong High School (District of Anda) and Mayuga National High School (District of Guindulman).

The researcher adopted and modified the questionnaire of Shahrin Kamaruzaman. The questionnaire has three categories: demographic profile, Individual influence which has two sub categories anxious to get ahead and procrastination, and social influence. There are five items of anxious to get ahead and another five questions for procrastination, which composed of ten total questions for individual category. The social influence category has 5 questions.

To determine the profile of the students' respondents, the percentage formula was used. To determine the common behavior of factors that affects academic honesty as perceived by the students and teachers, weighted mean was used. To determine the significant relationship between student's academic performance, profile and the factors affecting students' academic honesty, chi-squared test was used.

## RESULTS AND DISCUSSIONS

This study was conducted among the Grade 11 students and teachers of Candijay National High School (Candijay), Candabong High School (Anda), San Roque High School (Mabini), Alicia Technical Vocational High School (Alicia) and Mayuga National High School (Guindulman) during school year 2021-2022. The findings are herein presented and analyzed in light of the various aspects of the research problem.

**Table 1. Profile of the Student-Respondents**

|                                      | F          | %           |
|--------------------------------------|------------|-------------|
| <b>Age</b>                           |            |             |
| 16 years old and below               | 99         | 52.66       |
| 17 – 18 years old                    | 76         | 40.43       |
| 19 – 20 years old                    | 6          | 3.19        |
| 21 years old and above               | 7          | 3.72        |
| <b>Total</b>                         | <b>188</b> | <b>100</b>  |
| <b>Sex</b>                           |            |             |
| Male                                 | 61         | 32.40       |
| Female                               | 127        | 67.60       |
| <b>Total</b>                         | <b>188</b> | <b>100</b>  |
| <b>Academic Performance</b>          |            |             |
| Outstanding (90-100)                 | 83         | 44.15       |
| Very Satisfactory (85-89)            | 78         | 41.48       |
| Satisfactory (80-84)                 | 26         | 13.83       |
| Fairly Satisfactory (75-79)          | 1          | 0.53        |
| Did Not Meet expectations (below 75) | 0          | 0.00        |
| <b>Total</b>                         | <b>188</b> | <b>100%</b> |
| <b>Religion</b>                      |            |             |
| Roman Catholic                       | 167        | 88.83       |
| Born Again Christian                 | 12         | 6.38        |
| UCCP                                 | 3          | 1.60        |
| March of Faith                       | 2          | 1.06        |
| IFI                                  | 4          | 2.13        |
| <b>Total</b>                         | <b>188</b> | <b>100</b>  |

Table 1 exhibits the profile of the student-respondents. The table shows that students with age of 16 and below got the highest rank with a frequency of 99 respondents or 52.66% while students with age of 21 years old and above has the lowest rank with a frequency of 7 or 3.72% of the total respondents. It shows that there are students who pursue education with age of 21 years old and above in Grade 11. Education has no age limitation and it is being offered to all students who continue education in the midst of pandemic.

As to sex, most of the student-respondents are female with a frequency of one hundred twenty-seven (127) with a percentage of 67.60% while there are sixty-one (61) male students-respondents with a percentage of 32.40% of the total population. This implies that education is for all the students whatever our sex is. There will be equality of the rights of education.

As to academic performance, majority of the student-respondents has an outstanding academic performance with a frequency of 83 of the total respondents with a percentage of 44.15. However, there are no students who did not meet expectations or having a grade below 75.

As to religion, most of the student-respondents are Roman Catholic with a frequency of one hundred sixty-seven (167) with a percentage of 88.83 of the total population; however, students with a religion of March of faith got the lowest rank with a frequency of two (2) or 1.06% of the total population. The table shows that there are five religions where the respondents belong. It implies that public school embraces the differences of religion of the students. There is no discrimination of religion in the school.

**Table 2. Respondents' Perception on the Factors Affecting Academic Honesty of the Students**

| Statements  | Students    |          | Teachers    |          |
|---|-------------|----------|-------------|----------|
|   | WM          | DI       | WM          | DI       |
| <b>Individual Influence</b>   |             |          |             |          |
| <b>How to get ahead</b>   |             |          |             |          |
| Sometimes students tried to cheat because they want to get better grades.   | 2.85        | A        | 3.36        | SA       |
| In my opinion, students do unethical behavior because they are afraid of failing the subject.   | 2.79        | A        | 3.08        | A        |
| From my perspective, students may practice academic dishonesty because they are worried about being embarrassed in front of others for mistakes that they might do. | 2.72        | A        | 3.03        | A        |
| Sometimes, I/students perform academic dishonesty to maintain my high performance.  | 2.32        | D        | 3.00        | A        |
| In my opinion, students emphasize more on grades than learning.   | 2.79        | A        | 2.89        | A        |
| <b>Average Weighted Mean</b>  | <b>2.71</b> | <b>A</b> | <b>3.07</b> | <b>A</b> |
| <b>Procrastination</b>  |             |          |             |          |
| Believe that students tend to commit academic dishonesty to complete assignment in the last minute.   | 2.79        | A        | 3.31        | SA       |
| From my perspective, students plagiarize because they do not have enough time to get information or lack of resources.  | 2.69        | A        | 3.03        | A        |
| In my opinion, students procrastinate because they have lack of motivation to complete difficult task.  | 2.80        | A        | 3.03        | A        |
| Some students may copy their friends work because they have a lot of task in their house.   | 2.81        | A        | 3.08        | A        |
| Sometimes student found the activity difficult to answer.   | 3.02        | A        | 3.19        | A        |
| <b>Average Weighted Mean</b>  | <b>2.82</b> | <b>A</b> | <b>3.13</b> | <b>A</b> |
| <b>Social Influence</b>   |             |          |             |          |
| <b>Moral Identity</b>   |             |          |             |          |
| Competitive pressure from friends leads to academic dishonesty.   | 2.55        | A        | 3.06        | A        |
| I believe students cheat in exam because our friends accept and consider such activity as normal.   | 2.57        | A        | 3.08        | A        |
| From my perspective, students value friendship that's why students allow their friends do unethical behavior.   | 2.64        | A        | 3.14        | A        |
| In my opinion, students are lazy to study and work on their own.  | 2.69        | A        | 2.92        | A        |
| Academic dishonesty is not a serious issue.   | 1.97        | D        | 2.53        | A        |
| <b>Average Weighted Mean</b>  | <b>2.49</b> | <b>D</b> | <b>2.94</b> | <b>A</b> |
| <b>Composite Mean</b>   | <b>2.67</b> | <b>A</b> | <b>3.05</b> | <b>A</b> |

Legend: N1= 43; N2= 188  
 3.25 - 4.00 Strongly Agree (SA)  
 2.50 - 3.24 Agree (A)  
 1.75 - 2.49 Disagree (D)  
 1.00 - 1.74 Strongly Disagree (SD)

Table 2 displays the perception of the students and teachers on the factors that affect academic honesty. As to Individual influence, on how to get ahead, which states “Sometimes students tried to cheat because they want to get better grades” with a weighted mean of 2.85 (Agree) for the students and a weighted mean of 3.36 (Strongly Agree) for teachers.

The result coincides with the conclusion of the study of Ramberg & Modin (2019) which student grades affect academic honesty of the students. Students commit dishonesty to get higher grades.

As to procrastination, “Sometimes students found the activity difficult to answer” with a weighted mean of 3.02 (Agree).

It was supported in the study of Bibon & Barcenas (2021) stated that students have struggles in answering the modules independently. The excessive amounts of learning activities cause academic burn out and distress of the students. Furthermore, the study found out that problem on independent learning is associated to the degree of the difficulty of modules.

From the perspective of the teachers, “I believe my students tend to commit academic dishonesty to complete their assignment in the last minute” got the highest weighted mean of 3.31 (Agree).

Time pressure influences the decision making of every individual. If the individual is experiencing time pressure, there will be a certain psychological reactions will happen next (Beldona, 2010). Time pressures induce individual emotional changes when an individual experience with a time-limited context which in turns affect the individual’s perception and decision.

As to Social influence which is the moral identity, the highest rated statement by the students was “In my opinion, students are lazy to study and work on their own” with a weighted mean of 2.69 (Agree), the result shows that students’ connoted poor self-control of setting academic engagement at top priority of time allocation. In addition, the Department of education encourages the students to an-



swer the module on their own and not tolerate the perpetuation of cheating regardless of the learning delivery modality.

“From perspective, students value friendship that's why they allow their friends do unethical behavior” got the highest weighted mean of 3.14 (Agree) for the teacher-respondents.

In the study of Lesia & Hutapea (2015) results indicated that the participant with higher peer pressure had more significant to commit more academic misconduct. It is suggested from the study that an individual with peer who are tolerating cheating increases individual’s dishonesty in academic as well.

**Table 3. Students’ Academic Performance**  
N= 188

| Descriptor                | Grading Scale | Frequency  | Percentage  |
|---------------------------|---------------|------------|-------------|
| Outstanding               | 90 – 100      | 83         | 44.15       |
| Very Satisfactory         | 85 – 89       | 78         | 41.48       |
| Satisfactory              | 80 – 84       | 26         | 13.83       |
| Fairly Satisfactory       | 75 – 79       | 1          | 0.53        |
| Did Not Meet Expectations | Below 75      | 0          | 0.00        |
| <b>Total</b>              |               | <b>188</b> | <b>100%</b> |

Table 3 shows the students’ academic performance. Majority of the student-respondents has an outstanding academic performance with a frequency of 83 of the total respondents with a percentage of 44.15. However, there are no students who did not meet expectations or having a grade below 75.

**Table 4. Test of Relationship between Factors in Academic Performance and Students’ Profile**  
N= 188

| Profile  | X <sup>2</sup> | df | P-value | Interpretation  | Decision                     |
|----------|----------------|----|---------|-----------------|------------------------------|
| Age      | 10.763         | 6  | 0.096   | Not Significant | Do Not Reject H <sub>0</sub> |
| Sex      | 10.345         | 2  | 0.006   | Significant     | Reject H <sub>0</sub>        |
| Religion | 0.805          | 2  | 0.669   | Not Significant | Do Not Reject H <sub>0</sub> |

*\*Correlation is significant at 0.05 (2-tailed)*

The results agreed on the findings in the study of Blachinio (2019) that in academic dishonesty; men scored higher than women. Compared to women, men were reported to have more cheating behavior. These cheating behavior are plagiarism, cheating during test and false excuses. However, Gutierrez & Padagas (2019) found in their study that gender has no significant link to academic honesty.

However, there is no significant relationship between the students’ academic performance and their profile in terms of age,  $X^2(2) = 10.763$ ,  $p = 0.096$ , and religion,  $X^2(2) = 0.805$ ,  $p = 0.669$ , hence failed to reject the null hypothesis. This denotes that age and religion of the students has nothing to do with the performance of the students.

Thus, many studies opposed to this result. There are studies concluded that religious belief, academic performance and honesty are positively associated with each other (Scharer, 2017; Soto et.al, 2018). The religion of the learners and academic honesty was found to have a significant relationship (Buton, Talpade, & Haynes, 2011). In the research conducted by Hongwei et.al, (2016) added that religion and academic cheating, when we talk the relationship between the two variables, the measures proves vitally important.

Table 5 unveils the test of relationship between the students’ academic performance and perceived factors affecting academic honesty as to individual influence and social influence. The result deduced that there is no significant relationship between the students’ academic performance and perceived factors affecting academic honesty as to individual influence,  $X^2(6) = 8.101$ ,  $p = 0.231$ , and social influence,  $X^2(2) = 7.991$ ,  $p = 0.239$ , thus failed to reject the null hypothesis. This infers that academic performance of the students was not affected by the factors that affect academic honesty.

**Table 5. Test of Relationship between Students' Academic Performance and the Perceived Factors Affecting Academic Honesty**  
N= 188

| Academic Performance and.....                       | X <sup>2</sup> | df | p-value | Interpretation  | Decision                     |
|---|----------------|----|---------|-----------------|------------------------------|
| Perceived Factors Affecting Academic Honesty as to: |                |    |         |                 |                              |
| 1. Individual Influence                             | 8.101          | 6  | 0.231   | Not Significant | Do Not Reject H <sub>0</sub> |
| 2. Social Influence                                 | 7.991          | 6  | 0.239   | Not Significant | Do Not Reject H <sub>0</sub> |

\*Correlation is significant at 0.05 (2-tailed)

The result was contrasted by the study of Owe, et.al (2013) which stated individualism affects the focus of the person in decision making. Individuals focused on their own interest while collectivism focused the group more than the own interest (Jandt, 2010).

## CONCLUSION

Based on the above-stated findings of the study, the researchers concluded that there is a significant relationship between students' academic performance and their profile in terms of sex. However, there was no significant relationship between the students' academic performance and their profile in terms of age and religion. Furthermore, there was no significant relationship between the students' academic performance and perceived factors affecting academic honesty as to individual influence and social influence.

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# TEACHERS' INSTRUCTIONAL COMPETENCIES AND PERFORMANCE IN THE TRANSITION OF ALTERNATIVE LEARNING DELIVERY MODE FOR THE NEW NORMAL: BASIS FOR ENHANCEMENT PLAN

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## ABSTRACT

This study aimed to determine the teachers' instructional competencies and performance in the transition of alternative learning delivery mode for the new normal in all the schools of Ubay Districts during the School Year 2021-2022. The researcher employed the Descriptive Survey Method to determine the teachers' instructional competencies and performance in the transition of alternative learning delivery mode for the new normal with the aid of modified questionnaires. This study was conducted in the public elementary schools of the zone districts of Ubay to 564 total respondents through complete enumeration sampling technique. The result revealed that the respondents' level of instructional competence in terms of digital skills, adaptability skills, time management skills, communication skills and evaluation skills were all highly competent. Moreover, on the performance of the teachers in the transition of alternative learning delivery mode for the new normal majority of the teachers are assessed as Distinguished Teachers. There is a sufficient evidence of a significant relationship between the teachers' performance in the transition of alternative learning delivery mode for the new normal and the level of instructional competence in terms of digital skills, adaptability skills, time management skills, communication skills, and evaluation skills. Therefore, this study concludes that the level of instructional competence greatly affects the teachers' performance. Hence, the higher its instructional competence, the teachers have more opportunity to achieve excellent performance.

*Keywords: instructional competencies, teachers' performance, transition, alternative learning delivery mode, new normal*

## INTRODUCTION

The Department of Education (DepEd) has adopted its Basic Education Learning Continuity Plan (BE-LCP) for the Academic Year 2020-2021 to ensure that education continues despite the current circumstance. BE-LCP is a set of educational treatments designed to address the basic educational issues posed by COVID-19 (DepEd Order No. 12, 2020). Because face-to-face classes are still prohibited due to the public health situation, the department will implement alternative learning delivery modalities such as modular, television-based, radio-based instruction, blended, and online to protect the health, safety, and well-being of learners, teachers, and personnel, as well as to prevent the spread of COVID-19.

Thus, this study was conducted to determine the instructional competencies of the teachers in terms of digital skills, adaptability skills, time management skills, communication skills and evaluation skills and the performance of the teachers in the transition to the alternative learning delivery mode for the new normal. Teachers are the primary focus of this research, primarily because they are one of the most

difficult professions to work in at this time of crisis. They are reminded of the issues that the pandemic has brought to their professions for delivering the alternative learning delivery modes of teaching. Thus, teachers continue to explore more effective ways to better teaching under new normal and unleash creativity to consider alternative modes for education delivery that would cater to the needs of the learners.

## LITERATURE REVIEW

Teacher competencies are a method of evaluating teacher performance that is based on outcomes. Without prescribing any specific curriculum or instructional practices, they define key characteristics of successful teachers. Teacher training, licensure, and professional development can all benefit from the competence characteristics (Abanador, 2018).

For the Digital Skills, Information and Communications Technology is a key factor in online distance learning. The instruction-related challenge in online distance learning is rooted in financial difficulties. This hinders effective and balanced teaching and learning system (Musingafi, Mapuranga, Chizanza, & Zebon, 2015). The current situation of the learners is not different since not all have access to online tools and platforms. Financing distance learning poses a problem in any developing country like the Philippines (Rashid & Muhammad, 2012). The expenses are out of reach for the ordinary Filipino family's budget. Though low prices offering, sustainability falls under another concern.

Adaptability Skills, nothing in this world is constant. Being flexible and adaptive to changes allows us to survive and still succeed. Teachers are engaged in never ending learning; thus, teachers are open to learn new things which would help them grow. Flexibility and adaptability are essential skills for every teacher to possess. Operational of teachers may alter, change, and vary their teaching techniques through the requirements to learners, the availability of resources, and the context of surroundings. The place is higher importance to learners' achievements instead of rigid practices (Christenbury, 2011).

Time Management Skills is a vital skill for equal loads of home and work. They benefit from it since it allows teachers to complete tasks on deadline. This allows them to attend school duties, do responsibility at home, and restoring strength by resting. Establishing daily activities can help develop time efficiently through observes in a set schedule. Taking advantage of tools and technology to be used in works like outputs submission, recording and computing of grades, checking of manual works and instruction-delivery provides relaxation and comfortability (Raines, 2011).

Strong Communication Skills with Parents, Teachers, Stakeholders, and Learners, the school's lack of resources hinder it from achieving all of the requirements; the lapses are addressed via ongoing community involvement and collaboration with stakeholders. Collaboration is an important tool for ensuring that everyone has a positive learning experience. Good communication skills build positive effect to classroom environment. It can minimize anxiety, increase student participation, structure and encourage social interaction, foster positive learning environment and increase learning (Frisby & Martin 2010).

Evaluation Skills, for distance learning, teachers considered assessment as a big test they face in planning and preparation. In a study, teachers worried the equality of assessment towards distance learning and face-to-face discussions in guaranteeing that the students are taking the tests under the same conditions and situations, and students can be able to submit equivalent written works and other indicators of achievement of objectives (Kearns, 2012). The validity and trustworthiness of students' responses may also become an issue as distance learning cannot provide real-time guidance of teacher-facilitator when giving examinations and making outputs.

This study is anchored with Harter's Competence Motivation Theory. This is a theory of achievement motivation based on a person's feelings of personal competence. As a result, a person mastering its task, competence motivation rises. This motivates the individual to take on greater responsibilities. The ability of the teachers will aid in a high performance.

According to Bandura's Self-efficacy theory being a part of the social cognitive theory that can act as a factor to contribute to a better performance of the teachers or as an individual. It has a proven record of applying in the workplace affecting one's motivation and performance. Luneburg (2011) postulated that self-efficacy (beliefs about one's ability to accomplish specific tasks) influences the tasks employees choose to learn and the goals they set for themselves. Self-efficacy also affects employees' level of effort and persistence when learning difficult tasks. In other words, self-efficacy influences individuals in the context of which behavior reflects performance from their previously learned skills (Cabalsa, 2018).

One of the theories that also support this study is Piaget's Theory of Cognitive Development. One aspect of development with which schools are most concerned is cognitive development. This refers to the manner through which an individual comes to know and understand the world (McLeod, 2022). It refers to activities that involve thinking, perceiving, and problem-solving. It is the development of knowledge or general understanding. Piaget's theory had a significant impact on educational theory and practice. It has aided in the formation of a viewpoint in which the concept of developmentally appropriate education is emphasized.

## **OBJECTIVES**

This study aimed to determine the teachers' instructional competencies and performance in the transition of alternative learning delivery mode for the new normal in all the schools of Ubay Districts for S.Y. 2021-2022.

Specifically, it sought to answer the following:

1. The assessment of the respondents on the level of competence of the teachers in terms of digital skills; adaptability skills; time management skills; communication skills; and evaluation skills.
2. The level of performance of the teachers and school heads in the transition of alternative learning delivery mode for the new normal.
3. The relationship between the teachers' level of instructional competencies and performance during the transition of the alternative learning delivery mode for the new normal.

## **RESEARCH METHODOLOGY**

The researcher employed the Descriptive Survey Method to determine the teachers' instructional competencies and performance in the transition of alternative learning delivery mode for the new normal in all the schools of Ubay Districts for S.Y. 2021-2022. This study was conducted in the Second Congressional District of Bohol, particularly the municipality of Ubay, Bohol. The participants in this study were the (564), which comprises the forty-five (45) school heads and five hundred nineteen (519) teachers under the public elementary school of the three zone districts of Ubay, Bohol. The respondents of this study are selected through Complete Enumeration Sampling Technique.

## **RESULTS AND DISCUSSIONS**

The gathered data on the teacher-respondents' profile, teachers' level of instructional competencies, and the level of performance of the teachers in the transition of alternative learning delivery mode for the new normal are herein presented, analyzed, and interpreted.

Table 1.1 presents the Respondents' Assessment on Teachers' Level of Instructional Competence in Digital Skills, the overall weighted mean average was 3.19 or Moderately Competent which was item number 5 "provides opportunities for learners to gather information online." The teachers obtained average competency in the modern technology.

In a modern digital world, ICT is not just an option, but a rule (Cosmas & Mbvette, 2009). Furthermore, computer literacy relieves teachers from stress of manual operations of doing computer-generated reports as well as, communication with parents and students becomes easier, faster and convenient because of the technologies we have nowadays. The ingredients for efficiency of ICT to the process of teaching-learning are competence, confidence, and accessibility (Habibu, Al Mamun, & Clement, 2012).

**Table 1.1. Respondents' Assessment on Teachers' Level of Instructional Competence In Terms of Digital Skills**

| Statement  | Teachers    |           | School Heads |           | Overall     |           |
|--|-------------|-----------|--------------|-----------|-------------|-----------|
|  | WM          | VI        | WM           | VI        | WM          | VI        |
| As a teacher, I.../The teachers.....   |             |           |              |           |             |           |
| 1. use ICT in creating materials for learners' use.  | 3.35        | HC        | 3.60         | HC        | 3.48        | HC        |
| 2. incorporate and integrate different forms of media into instruction.  | 3.24        | MC        | 3.47         | HC        | 3.36        | HC        |
| 3. have updates on educational trends and issues through internet access.  | 3.35        | HC        | 3.47         | HC        | 3.41        | HC        |
| 4. am/are easily accessible (thru text messages, FB messenger or other forms of communication).                            | 3.45        | HC        | 3.71         | HC        | 3.58        | HC        |
| 5. provide opportunities for learners to gather information online.  | 3.09        | MC        | 3.29         | HC        | 3.19        | MC        |
| 6. access internet resources for planning instruction or collecting ideas.   | 3.31        | HC        | 3.49         | HC        | 3.40        | HC        |
| 7. make printed materials for remediation for slow learners.   | 3.45        | HC        | 3.60         | HC        | 3.53        | HC        |
| 8. utilize the e-class record in determining learners' achievements.   | 3.48        | HC        | 3.69         | HC        | 3.59        | HC        |
| 9. submit computer-generated reports.  | 3.53        | HC        | 3.73         | HC        | 3.63        | HC        |
| 10. respond clearly to questions asked by parents and students through text messages and social medias.                    | 3.50        | HC        | 3.76         | HC        | 3.63        | HC        |
| 11. communicate to colleagues by means of social media.  | 3.53        | HC        | 3.71         | HC        | 3.62        | HC        |
| 12. evaluate the resources and the available information.  | 3.41        | HC        | 3.67         | HC        | 3.54        | HC        |
| 13. efficiently incorporate and employ ICT's (Information and Communication Technologies) in his/her teacher related work. | 3.39        | HC        | 3.49         | HC        | 3.44        | HC        |
| 14. find materials to use in class as sources of knowledge, such as databases, documentaries, and websites.                | 3.35        | HC        | 3.51         | HC        | 3.43        | HC        |
| 15. provide learners with a range of options for repackaging knowledge and engaging in real media learning experiences.    | 3.27        | HC        | 3.44         | HC        | 3.36        | HC        |
| <b>Average Weighted Mean</b>   | <b>3.38</b> | <b>HC</b> | <b>3.57</b>  | <b>HC</b> | <b>3.48</b> | <b>HC</b> |

Legend: N1 = 519; N2 = 45  
**Rating Scale Verbal Interpretation (VI) Weighted Mean(WM)**  
 3.25 – 4.00 Highly Competent (HC)  
 2.50 – 3.24 Moderately Competent (MC)  
 1.75 – 2.49 Fairly Competent (FC)  
 1.00 – 1.74 Poor (P)

**Table 1.2. Respondents' Assessment on Teachers' Level of Instructional Competence In Terms of Adaptability Skills**

| Statement   | Teachers    |           | School Heads |           | Overall     |           |
|---|-------------|-----------|--------------|-----------|-------------|-----------|
|   | WM          | VI        | WM           | VI        | WM          | VI        |
| As a teacher, I.../The teachers.....  |             |           |              |           |             |           |
| 1. am/are able to revise the way he/she thinks about a new situation to help get through it.  | 3.33        | HC        | 3.56         | HC        | 3.45        | HC        |
| 2. can alter thoughts or expectations at work to help in a new circumstance.  | 3.29        | HC        | 3.51         | HC        | 3.40        | HC        |
| 3. am/are able to adapt any changes that may occur in the learning environment.   | 3.45        | HC        | 3.62         | HC        | 3.54        | HC        |
| 4 have willingness for professional and personal growth.  | 3.52        | HC        | 3.64         | HC        | 3.58        | HC        |
| 5. am/are sincere towards teaching.   | 3.61        | HC        | 3.71         | HC        | 3.66        | HC        |
| 6. have a feeling of responsibility towards the students.   | 3.65        | HC        | 3.76         | HC        | 3.71        | HC        |
| 7. am/are able to successfully deal with new problems by seeking out fresh knowledge, helpful counsel, or beneficial resources.   | 3.43        | HC        | 3.58         | HC        | 3.51        | HC        |
| 8. am/are able to discover new methods of doing things (e.g., an alternative manner of doing something or obtaining information) to assist in getting through uncertain situations at work. | 3.39        | HC        | 3.56         | HC        | 3.48        | HC        |
| 9. have the ability to consider a variety of possibilities for assisting in a new scenario.   | 3.42        | HC        | 3.56         | HC        | 3.49        | HC        |
| 10. can modify the way in doing things if necessary to help in a new circumstance at work.  | 3.43        | HC        | 3.64         | HC        | 3.54        | HC        |
| 11. am/are able to reduce negative emotions (e.g., fear) to help deal with uncertain situations.  | 3.36        | HC        | 3.56         | HC        | 3.46        | HC        |
| 12. when uncertainty arises at work, able to minimize frustration or irritation to deal with it best.   | 3.32        | HC        | 3.58         | HC        | 3.45        | HC        |
| 13. to help get through to new situations at work, draw on positive feelings and emotions (e.g., enjoyment, satisfaction).  | 3.35        | HC        | 3.58         | HC        | 3.47        | HC        |
| 14. to effectively cope with new problems in the classroom, seek out fresh knowledge, helpful counsel, or beneficial resources.   | 3.38        | HC        | 3.64         | HC        | 3.51        | HC        |
| 15. apply the established curriculum with a certain amount of flexibility for a better class dynamic.   | 3.39        | HC        | 3.56         | HC        | 3.48        | HC        |
| <b>Average Weighted Mean</b>  | <b>3.42</b> | <b>HC</b> | <b>3.60</b>  | <b>HC</b> | <b>3.51</b> | <b>HC</b> |

Legend:  
**Rating Scale Verbal Interpretation (VI) Weighted Mean(WM)**  
 3.25 – 4.00 Highly Competent (HC)  
 2.50 – 3.24 Moderately Competent (MC)  
 1.75 – 2.49 Fairly Competent (FC)  
 1.00 – 1.74 Poor (P)

The table presents the Respondents' Assessment on Teachers' Level of Instructional Competence in Adaptability Skills. Thus, the highest overall weighted mean average under the Adaptability Skills was 3.63 or Highly Competent which is item number 6 "have a feeling of responsibility towards the students", while the lowest overall weighted mean average was item number 2 "can alter thoughts or expectations at work to help in a new circumstance" with 3.40 or Highly Competent. The respondents are flexible in performing their job as evident of very high adaptability skills.

Even though, there are lots of challenges and stresses felt by the teachers, they also spoke of their innovative solutions and find more ways to of having the feeling of responsibility to the learners. A core tenant of teaching is adaptability. In a recent study published by Kaden (2020), the researcher found that teachers took on additional responsibilities and an increased workload as a result of the pandemic.

Table 1.3 presents the Respondents' Assessment on Teachers' Level of Instructional Competence in Time Management Skills. Thus, the highest overall weighted mean average under the Time Management Skills was 3.67 or Highly Competent which is item number 1 "prioritizes work and allocates time accordingly", while the lowest overall weighted mean average was item number 11 "punctual in all activities" with 3.34 or Highly Competent. With the result, the teachers able to handle time effectively.

**Table 1.3. Respondents' Assessment on Teachers' Level of Instructional Competence in Terms of Time Management Skills**

| Statement  | Teachers    |           | School Heads |           | Overall     |           |
|--|-------------|-----------|--------------|-----------|-------------|-----------|
|  | WM          | VI        | WM           | VI        | WM          | VI        |
| As a teacher, I.../ The teachers.....                                      |             |           |              |           |             |           |
| 1. prioritize work and allocate time accordingly                           | 3.61        | HC        | 3.73         | HC        | 3.67        | HC        |
| 2. accomplish what needs to be done during the day.                        | 3.55        | HC        | 3.69         | HC        | 3.62        | HC        |
| 3. tackle difficult or unpleasant tasks without procrastinating.           | 3.38        | HC        | 3.51         | HC        | 3.45        | HC        |
| 4. am/are able to meet deadlines without rushing at the last minute.       | 3.31        | HC        | 3.44         | HC        | 3.38        | HC        |
| 5. prevent interruptions from distracting from high priority tasks.        | 3.28        | HC        | 3.56         | HC        | 3.42        | HC        |
| 6. have a weekly schedule on recording fixed commitments such as work .    | 3.37        | HC        | 3.53         | HC        | 3.45        | HC        |
| 7. have a clear idea of what to accomplish during the forthcoming quarter. | 3.42        | HC        | 3.51         | HC        | 3.47        | HC        |
| 8. prioritize list in order of importance, not urgency.                    | 3.44        | HC        | 3.58         | HC        | 3.51        | HC        |
| 9. spend enough time on work-related activities.                           | 3.50        | HC        | 3.62         | HC        | 3.56        | HC        |
| 10. periodically re-assess activities in relation to goals.                | 3.45        | HC        | 3.47         | HC        | 3.46        | HC        |
| 11. am/are punctual in all activities.                                     | 3.34        | HC        | 3.33         | HC        | 3.34        | HC        |
| 12. feel use of time effectively.  | 3.48        | HC        | 3.64         | HC        | 3.56        | HC        |
| 13. find ways to celebrate accomplishment at work.                         | 3.47        | HC        | 3.49         | HC        | 3.48        | HC        |
| 14. plan to relax and be with friends in a weekly schedule.                | 3.32        | HC        | 3.42         | HC        | 3.37        | HC        |
| 15. satisfy with the way of using and utilizing time.                      | 3.42        | HC        | 3.56         | HC        | 3.49        | HC        |
| <b>Average Weighted Mean</b>   | <b>3.42</b> | <b>HC</b> | <b>3.54</b>  | <b>HC</b> | <b>3.48</b> | <b>HC</b> |

Legend: N1 = 519; N2 = 45  
**Rating Scale**    **Verbal Interpretation (VI)**    **Weighted Mean(WM)**  
3.25 – 4.00    Highly Competent (HC)  
2.50 – 3.24    Moderately Competent (MC)  
1.75 – 2.49    Fairly Competent (FC)  
1.00 – 1.74    Poor (P)

Raines (2011) stated that time management means the maximum use of time for the productivity and achievement. Time Management Skills is a vital skill for equal loads of home and work. They benefit from it since it allows teachers to complete tasks on deadline. This allows them to attend school duties, do responsibility at home, and restoring strength by resting.

Table 1.4 presents the Respondents' Assessment on Teachers' Level of Instructional Competence in Communication Skills. Thus, the highest overall weighted mean average under the Communication Skills was 3.66 or Highly Competent which are items number 10 "have sympathetic attitude towards students" and number 12 "treat each student as an individual who deserves respect, rather than as a representative of a group".



The result manifests the importance for teachers to have sympathetic attitude and equal treatment to the students. It is vital to have rapport between the teachers and students because it is significant in the factor in the overall learning and success of individual students. Good communication skills build positive effect to classroom environment. It can minimize anxiety, increase student participation, structure and encourage social interaction, foster positive learning environment and increase learning (Frisby & Martin 2010).

**Table 1.4. Respondents' Assessment on the Teachers' Level of Instructional Competence in Terms of Communication Skills**

| Statement   | Teachers    |           | School Heads |           | Overall     |           |
|---|-------------|-----------|--------------|-----------|-------------|-----------|
|   | WM          | VI        | WM           | VI        | WM          | VI        |
| As a teacher, I.../ The teachers.....   |             |           |              |           |             |           |
| 1. build harmonious relationships with the learners, parents and other stakeholders.  | 3.59        | HC        | 3.62         | HC        | 3.60        | HC        |
| 2. collaborate with other members of the staff in the functional activities.  | 3.55        | HC        | 3.56         | HC        | 3.56        | HC        |
| 3. cooperate institution staff, parents and students.   | 3.59        | HC        | 3.67         | HC        | 3.63        | HC        |
| 4. avoid any form of discrimination towards students, parents or colleagues.  | 3.55        | HC        | 3.69         | HC        | 3.62        | HC        |
| 5. work effectively with people from a variety of social and cultural backgrounds by respecting cultural differences.               | 3.53        | HC        | 3.62         | HC        | 3.58        | HC        |
| 6. cooperate for meeting team goals even at expense of personal preferences.  | 3.52        | HC        | 3.69         | HC        | 3.61        | HC        |
| 7. encourage student interest and the motivation to learn.  | 3.60        | HC        | 3.69         | HC        | 3.65        | HC        |
| 8. respond to students requests promptly and to treat all students with respect.  | 3.54        | HC        | 3.64         | HC        | 3.59        | HC        |
| 9. encourage cooperative learning tasks and discourage negative rivalry among learners and parents to promote cooperative learning. | 3.54        | HC        | 3.67         | HC        | 3.61        | HC        |
| 10. have sympathetic attitude towards students.   | 3.62        | HC        | 3.69         | HC        | 3.66        | HC        |
| 11. have the natural capacity to motivate, excite, and inspire students and others.   | 3.60        | HC        | 3.67         | HC        | 3.64        | HC        |
| 12. treat each student as an individual who deserves respect, rather than as a representative of a group.                           | 3.58        | HC        | 3.73         | HC        | 3.66        | HC        |
| 13. give value and respect to other opinions, ideas and beliefs.  | 3.60        | HC        | 3.71         | HC        | 3.65        | HC        |
| 14. manage and document conflicts that arise with parents or learners.  | 3.51        | HC        | 3.67         | HC        | 3.59        | HC        |
| 15. negotiate to teach a peaceable resolution or compromise acceptable for everyone.  | 3.49        | HC        | 3.58         | HC        | 3.54        | HC        |
| <b>Average Weighted Mean</b>  | <b>3.56</b> | <b>HC</b> | <b>3.66</b>  | <b>HC</b> | <b>3.61</b> | <b>HC</b> |

Legend:  $N1 = 519; N2 = 45$   
**Rating Scale** Verbal Interpretation (VI) Weighted Mean(WM)  
 3.25 – 4.00 Highly Competent (HC)  
 2.50 – 3.24 Moderately Competent (MC)  
 1.75 – 2.49 Fairly Competent (FC)  
 1.00 – 1.74 Poor (P)

**Table 1.5. Respondents' Assessment on the Teachers' Level of Instructional Competence in Terms of Evaluation Skills**

| Statement   | Teachers |    | School Heads |    | Overall |    |
|---|----------|----|--------------|----|---------|----|
|   | WM       | VI | WM           | VI | WM      | VI |
| As a teacher, I.../ The teachers.....   |          |    |              |    |         |    |
| 1. evaluate the resources and the available information.  | 3.43     | HC | 3.56         | HC | 3.50    | HC |
| 2. interweave the content of the subject matter with other subjects.  | 3.35     | HC | 3.47         | HC | 3.41    | HC |
| 3. give effective and timely feedback to the students.  | 3.45     | HC | 3.58         | HC | 3.52    | HC |
| 4. give evaluation results and ratings that are well-accepted by the students.  | 3.49     | HC | 3.64         | HC | 3.57    | HC |
| 5. utilize evaluation result as a basis for improving instruction   | 3.50     | HC | 3.67         | HC | 3.59    | HC |
| 6. evaluate students' performances fairly and uses adequate and accurate standard measures of evaluation.                                       | 3.47     | HC | 3.64         | HC | 3.56    | HC |
| 7. apply the assessment criteria specified in the subject's curriculum to the activities.   | 3.42     | HC | 3.53         | HC | 3.48    | HC |
| 8. provide evaluative activities appropriate for students' abilities, interests and needs.  | 3.44     | HC | 3.56         | HC | 3.50    | HC |
| 9. use different methods in evaluating students' learning aligned to the learning objectives such as oral performance, projects, hands-on, etc. | 3.43     | HC | 3.49         | HC | 3.46    | HC |

|  |             |           |             |           |             |           |
|--|-------------|-----------|-------------|-----------|-------------|-----------|
| 10. guide the learners in examining reliability, bias, or credibility of claims by means of giving activities that suit in.                      | 3.42        | HC        | 3.53        | HC        | 3.48        | HC        |
| 11. include items in the tests that are based on the lesson objectives consisted with actual discussions, activities and classroom interactions. | 3.44        | HC        | 3.60        | HC        | 3.52        | HC        |
| 12. give grades on the basis of students' actual performance.  | 3.44        | HC        | 3.60        | HC        | 3.52        | HC        |
| 13. provide learners with performance standards by which their work will be evaluated  | 3.44        | HC        | 3.56        | HC        | 3.50        | HC        |
| 14. ratings are based on the lesson's objectives and the criteria established in class.  | 3.44        | HC        | 3.58        | HC        | 3.51        | HC        |
| 15. treat each student fairly in giving grades.  | 3.51        | HC        | 3.62        | HC        | 3.57        | HC        |
| <b>Average Weighted Mean</b>   | <b>3.44</b> | <b>HC</b> | <b>3.57</b> | <b>HC</b> | <b>3.51</b> | <b>HC</b> |

Legend: N1 = 519; N2 = 45  
**Rating Scale**    **Verbal Interpretation (VI)**    **Weighted Mean(WM)**  
3.25 – 4.00    Highly Competent (HC)  
2.50 – 3.24    Moderately Competent (MC)  
1.75 – 2.49    Fairly Competent (FC)  
1.00 – 1.74    Poor (P)

Table 1.5 presents the Respondents' Assessment on Teachers' Level of Instructional Competence in Evaluation Skills. Thus, the highest overall weighted mean average under the Evaluation Skills was 3.59 or Highly Competent which are items number 5 "utilizes evaluation result as a basis for improving instruction", while the lowest overall weighted mean average was item number 2 "interweaves the content of the subject matter with other subjects" with 3.41 or Highly Competent.

The result shows that teachers' evaluation and assessment results are significant because of their direct relation to classroom instructional goals. This deals with the evaluation of the students' actual performance with fairness and variety of techniques to harness the utmost capacity of the students. The result was supported by McMillan (2000) who stated that the process of evaluating students should be authentic. Same thing was said by Nem Singh (2009) only adding that evaluation is a process determining marks to be given based on the collected information from the students' actual performances.

Table 2 presents the Teachers' and School Heads Assessment on Teachers' Performance. Under the first domain which is the Content Knowledge and Pedagogy, the highest overall weighted mean average under the first domain was 3.27 or Distinguished Teacher which is item number 3 "positive use of ICT", while the lowest overall weighted mean average was 3.13 or Highly Proficient Teacher which was item number 2 "research-based knowledge and principles of teaching and learning." In general, the respondents considered themselves as proficient in terms of Domain 1. However, most of the teachers are still unconcerned with research involvement and the development of Higher Order Thinking Skills. Hence, there is a prior need for teachers to boost their research engagement so that new ideas and innovations, including Higher Order Thinking Skills, in teaching and learning, could be explored and applied in the classroom.

**Table 2. Teachers' and School Heads Assessment on Teachers' Performance**

| Domain  | Teachers    |           | School Heads |           | Overall     |           |
|---|-------------|-----------|--------------|-----------|-------------|-----------|
|   | WM          | VI        | WM           | VI        | WM          | VI        |
| <b>Domain 1: Content Knowledge and Pedagogy</b>                 | 3.11        | HPT       | 3.28         | DT        | 3.20        | HPT       |
| <b>Domain 2. Learning Environment</b>                           | 3.27        | DT        | 3.36         | DT        | 3.32        | DT        |
| <b>Domain 3. Diversity of Learners</b>                          | 3.14        | HPT       | 3.29         | DT        | 3.22        | HPT       |
| <b>Domain 4. Curriculum and Planning</b>                        | 3.21        | HPT       | 3.36         | DT        | 3.29        | DT        |
| <b>Domain 5. Assessment and Reporting</b>                       | 3.18        | HPT       | 3.30         | DT        | 3.24        | HPT       |
| <b>Domain 6. Community Linkages and Professional Engagement</b> | 3.27        | DT        | 3.35         | DT        | 3.31        | DT        |
| <b>Domain 7. Personal Growth and Professional Development</b>   | 3.27        | DT        | 3.44         | DT        | 3.36        | DT        |
| <b>Average Weighted Mean</b>                                    | <b>3.21</b> | <b>HC</b> | <b>3.35</b>  | <b>HC</b> | <b>3.28</b> | <b>HC</b> |

Legend: N1 = 519; N2 = 45  
**Rating Scale**    **Verbal Interpretation (VI)**    **Weighted Mean (WM)**  
3.25 – 4.00    Distinguished Teacher (DT)  
2.50 – 3.24    Highly Proficient Teacher (HPT)  
1.75 – 2.49    Proficient Teacher (PT)  
1.00 – 1.74    Beginning Teacher (BT)

For the second domain which is the Learning Environment, the highest overall weighted mean average under the second domain was 3.37 or Distinguished Teacher which is item number 1 “learner safety and security”, while the lowest overall weighted mean average was 3.28 or Distinguished Teacher which was item number 5 “promotion of purposive learning.”

Teachers still need to emphasize the need for purposive learning so that students could develop independent and free thinking.

For the third domain which is the Diversity of Learners, the highest overall weighted mean average under the third domain was 3.29 or Distinguished Teacher which was item number 1 “learners’ gender, needs, strengths, interests and experiences”, while the lowest overall weighted mean average was 3.19 or Highly Proficient Teacher which were items number 3 “learners’ with disabilities, giftedness and talents” and number 5 “learners from indigenous groups.”

In the fast-moving society, schools face the ever-changing demands of the curriculum that is responsive and relevant to the needs of the learners who are diversified by the culture cultures they are living in today. The Philippines, for an instance, besides its rich and indigenous cultural heritage, is open for western and free acculturation due to the advent of globalization. This presupposes the idea for the development of sensitivity between and among faculty in handling indigenous groups and learners influenced by the globalized society. The same is true in handling learners with disabilities so that no learner would be left behind.

For the fourth domain which is the Curriculum and Planning, the highest overall weighted mean average under the fourth domain was 3.31 or Distinguished Teacher which are items number 1 “planning and management of teaching and learning process” and number 2 “learning outcomes aligned with learning competencies” while the lowest overall weighted mean average was 3.28 or Distinguished Teacher which was item number 5 “teaching and learning resources including ICT.”

It could be deduced that teachers still hold an ambivalent attitude towards ICT integration in the classroom. Through the years, this issue is commonly attributed to lack of facilities and inability, if not, preference of some teachers to manipulate traditional educational tools than the new ones.

For the fifth domain which is the Assessment and Reporting, the highest overall weighted mean average under the fifth domain was 3.29 or Distinguished Teacher which was item number 2 “monitoring and evaluation of learner progress and achievement”, while the lowest overall weighted mean average was 3.21 or Highly Proficient Teacher which was item number 1 “design, selection, organization and utilization of assessment strategies”

For the sixth domain which is the Community Linkages and Professional Engagement, the highest overall weighted mean average under the sixth domain was 3.37 or Distinguished Teacher which was item number 3 “professional ethics”, while the lowest overall weighted mean average was 3.25 or Distinguished Teacher which was item number 1 “establishment of learning environments that are responsive to community contexts.”

This domain promotes collaboration between the community and schools that is evident through projects and programs which foster the development of a strong partnership between and among stakeholders both internally and externally. This collaboration is required so that schools could respond to the needs of the society and vice versa. Teachers are expected to become an effective and efficient collaborator and community-builder.

For the seventh domain which is the Personal Growth and Professional Development, thus, the highest overall weighted mean average under the seventh domain was 3.43 or Distinguished Teacher which was item number 2 “dignity of teaching as a profession”, while the lowest overall weighted mean average was 3.26 or Distinguished Teacher which was item number 1 “philosophy of teaching.”

According to Arthur and Philips (2002), competency entails the teacher's obligation to offer proof of students' success. It is how teachers function; identify skills, and connect to total student success based on their ability. In line with the mandate of the DepEd to provide quality education, teachers are encouraged to engage in Continuing Professional Development programs to earn units and improve their knowledge, skills, and values relative to the philosophy of teaching.

**Table 3. Test of Relationship Between the Teachers' Performance and Level of Instructional Competence**

| Teachers' performance and... | r <sub>s</sub> | df  | p-value | Interpretation | Decision              |
|------------------------------|----------------|-----|---------|----------------|-----------------------|
| Digital Skills               | 0.383          | 517 | <.001   | Significant    | Reject H <sub>0</sub> |
| Adaptability Skills          | 0.171          | 517 | <.001   | Significant    | Reject H <sub>0</sub> |
| Time Management Skills       | 0.267          | 517 | <.001   | Significant    | Reject H <sub>0</sub> |
| Communication Skills         | 0.370          | 517 | <.001   | Significant    | Reject H <sub>0</sub> |
| Evaluation Skills            | 0.394          | 517 | <.001   | Significant    | Reject H <sub>0</sub> |
| Overall Teachers' Competence | 0.427          | 517 | <.001   | Significant    | Reject H <sub>0</sub> |

\*Correlation is significant at 0.05 (2-tailed)

Table 3 discloses the test of relationship between the teachers' performance and the level of instructional competence in terms of digital skills, adaptability skills, time management skills, communication skills, evaluation skills. The result shown that there is a sufficient evidence of a significant relationship between the teachers' performance and the level of instructional competence in terms of digital skills,  $r(517)=0.383$ ,  $p<.001$ , adaptability skills,  $r(517)=0.171$ ,  $p<.001$ , time management skills,  $r(517)=0.267$ ,  $p<.001$ , communication skills,  $r(517)=0.370$ ,  $p<.001$ , and evaluation skills,  $r(517)=0.394$ ,  $p<.001$ .

Likewise, the overall teachers' competence and performance is statistically significant,  $r(517)=0.427$ ,  $p<.001$  thus reject the null hypothesis. This denotes that the level of instructional competence greatly affect the teachers' performance. Hence, the higher its instructional competence, the teachers have more opportunity to achieve excellent performance.

This is anchored on a study about self-efficacy as defined by Bandura (1986) refers to judgments coming from an individual of their abilities to form and implement the required the action to obtain the types of performances". He also defined self-efficacy as an individual's belief about their capabilities to exercise performance to complete tasks to reach goals. This means that individuals with a strong sense of efficacy assert more on their ability to fulfill a task (Bandura, 1977) this led to the understanding that a person's confidence is an essential component to accomplish something. A strong self-efficacy in many ways improves personal accomplishments and well-being. Since self-efficacy plays on how an individual perceived a situation. It is also how an individual behaves in response to different situations. An individual will successfully function in any setting to achieve goals. In other words, self-efficacy is served as a connecting link to the person's goals, performance, and motivation. It is one of the individual-related concepts that serve as meditating mechanisms among concepts.

## CONCLUSION

The teachers' manifested highly competence level of instructional competencies in terms of digital skills, adaptability skills, time management skills, communication skills and evaluation skills. Hence, the teachers reached a high level of instructional competence as it greatly affects their performance and having more opportunity to achieve excellent and execute well at school or in their field of work.

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# **SOCIAL RELATIONS AND SELF-ESTEEM AMONG STUDENTS OF DANA O NATIONAL HIGH SCHOOL, POBLACION, DANA O, BOHOL**

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## **ABSTRACT**

**This study delved into the level of social relations and self-esteem among Grade 7 to Grade 12 students of Danao National High School at Poblacion, Danao, Bohol. Specifically, it sought to determine the level of self-esteem and the level of social relations among the respondents in the areas of relationship with parents, peers, and teachers. This study utilized descriptive-correlational research design. The respondents of the study are the 286 students of Danao National High School. They were selected using proportionate random sampling technique from the 1,144 students who are listed in the school's roster from Grade 7 to Grade 12. The level of social relations of students in Danao National High School is very good on relationship with parents, relationship with peers and relationship with teachers. This implies that the students has a very good social skills. There is a significant degree correlation between level of social relations and self-esteem among students. It revealed that the higher the students' level of social relations so goes with the level of self-esteem.**

*Keywords: Social Relations, Social Skills, Self-esteem, Relationship*

## **INTRODUCTION**

The primary goal of education is the holistic development of every learner. It plays a paramount role in shaping the students' perspective in life as they prepare for future leadership as encapsulated in the saying "students today, leaders tomorrow." Such goal can only be attained when students are given quality education where they are given avenues to make sense of their subjects with the assistance and guidance of their teachers who serve as facilitators in the learning process.

Responding to the needs of the time, the Philippine government through the Department of Education implemented a new learning paradigm anchored from a learner-centered approach. When former President Benigno Aquino, Jr. signed into Law the K to 12 Program also known as the Enhanced Basic Education Act of 2013, the entire educational system was changed (Baker, 2008). The reformation of the curriculum was a complete deviation from the traditional teacher-centered style of teaching espoused in the previous curriculum of the Department of Education. This law was a result of previous studies declaring the insufficiency of the previous running curriculum in attaining a quality education. The previous approach was deemed defective and unresponsive to the needs of the 21st-century learners who are touted as social learners.

The K-12 curriculum anchors on the idea of constructivism and collaborative learning where every learner becomes responsible in their learning phase. In this way, students interact and mingle with their co-learners to attain the objectives of every lesson. Since collaborative learning requires learners to connect with each other in the classroom, then it is imperative to possess a positive perception of oneself (i.e. self-esteem) and ability to interact and communicate with others (i.e. social relations).

Cognizant of the importance of self-esteem and social relations in the constructivist and collaborative learning approach, it is only logical and appropriate to study these constructs among the students in the public setting, most especially at the high school level to ensure that they can easily adapt to the current educational framework.

As a new comer in the Department of Education, the researcher finds this study very timely and suitable since the K to 12 Law was only started in 2013 and the Department of Education is still in the process of adjusting from this curricular revision. In fact, a lot of teachers from the Department are still confused between the traditional and the latest pedagogies in teaching which can be observed in the manner they teach in their respective classrooms.

Being one of the front lines in the field, the researcher is very much hopeful that this study will somehow help the teachers and administrators in responding the needs of the students thereby fulfilling the mission and vision of DepEd. Furthermore, based on the researcher's knowledge and personal reading, there is a paucity of this type of research in the province. There has never been a published research work in the locality which tackles the variables of the study. For this reason, it must be pursued without reservation.

## GENERAL OBJECTIVES

### Specific Objectives:

The study has the following specific objectives:

1. Determine the level of self-esteem of the respondents
2. Determine the respondents' level of social relations with their:
  - 2.1. Parents
  - 2.2. Peers and
  - 2.3. teachers
3. Relate the level of self-esteem and their social relations with:
  - 3.1. Parents
  - 3.2. Peers and
  - 3.3. teachers

## METHODOLOGY

This study utilized descriptive-correlational research design. This study was conducted at Danao National High School - a DepEd operated school, located at Poblacion, Danao, Bohol. The respondents of the study are the 286 students. They were selected using proportionate random sampling technique from the 1, 144 students who are listed in the school's roster from Grade 7 to Grade 12. The researchers made use of standardized questionnaires. The first variable which is "Self-Esteem" is measured using the Rosenberg Self-Esteem Scale (RSES), a widely known tool in social science research which was developed by Morris Rosenberg, a sociologist. It is composed of ten (10) items. The second variable which is "Social Relations" is measured using Deepu's (2010) Social Skills Questionnaire (SSQ). SSQ purports to measure three areas of a person's relationship, namely: relationship with parents, relationship with peers, and relationship with teachers. It has a total of 30 item questions distributed in the three types of relationship. The study used percentage, weighted mean, Pearson- Product Coefficient Moment Correlation and ANOVA.

## RESULTS

### Level of Self-Esteem among the respondents

Self-esteem in most students 'mirrors' the appraisals of others, in particular parents and teachers. According to the result, the pointed out: the respondents take a positive regard about themselves which ranked one on the list which is still on average level. The composite mean revealed average level of self-esteem among respondents as indicated by 2.79 generated from all of the items in the table.

**Table 1. Level of Self-Esteem among the Respondents  
(N = 286)**

| Items                 |  | Average (N = 286) |                |      |
|-----------------------|--|-------------------|----------------|------|
|                       |  | WM                | DV             | Rank |
| 1                     | On the whole, I am satisfied with myself.                                  | 2.98              | Average        | 3    |
| 2                     | At times, I think I am no good at all. (-)                                 | 2.76              | Average        | 5    |
| 3                     | I feel that I have a number of good qualities.                             | 3.03              | Average        | 2    |
| 4                     | I am able to do things as well as most other people.                       | 2.86              | Average        | 4    |
| 5                     | I feel I do not have much to be proud of. (-)                              | 2.69              | Average        | 8    |
| 6                     | I certainly feel useless at times(-)                                       | 2.73              | Average        | 6    |
| 7                     | I feel that I'm a person of worth, at least on an equal plane with others. | 2.63              | Average        | 9    |
| 8                     | I wish I could have more respect for myself. (-)                           | 2.17              | Low            | 10   |
| 9                     | All in all, I am inclined to feel that I am a failure. (-)                 | 2.71              | Average        | 7    |
| 10                    | I take a positive attitude toward myself.                                  | 3.06              | Average        | 1    |
| <b>Composite Mean</b> |  | <b>2.76</b>       | <b>Average</b> |      |

It can be revealed from the result that “trust” is the cornerstone of family wellbeing. The level of trust among the respondents to their parents is on a wide range of aspects. Mutual respect between parent and child go a long way toward maintaining trust. In the table below, it can be implied that the level of social relations among the respondents towards their parents is good standing. Furthermore, it is interesting to note that parents do not choose who will become their children’s friends. Basically, friends accompany as people grow up and have an importance influence on social relations and the way they see the world. For this reason, many parents may be tempted to choose their children’s friends in order to spare them possible suffering. However, the result showed that the respondents have the right to find people they are comfortable with and to befriend them.

**Table 2. Respondents’ Level of Social Relations with Parents  
(N = 286)**

| Items                 | Statements  | Average (N = 286) |                  |      |
|-----------------------|---|-------------------|------------------|------|
|                       |   | WM                | DV               | Rank |
| <b>A.</b>             | <b>RELATIONSHIP WITH PARENTS</b>  |                   |                  |      |
| 1                     | I worry about my relationship with my parents                                 | 3.55              | Very Good        | 6    |
| 2                     | Parents compare me with my siblings.  | 3.35              | Good             | 9    |
| 3                     | I sense blame on me from my family  | 3.38              | Good             | 7    |
| 4                     | I feel stressed due to pressure of my parents.                                | 3.36              | Good             | 8    |
| 5.                    | I am satisfied with the support given by my parents                           | 4.09              | Very Good        | 4    |
| 6                     | I am confident that I would be taken care of well by my parents if I am sick. | 4.24              | Excellent        | 2    |
| 7                     | My parents spend time with me   | 4.14              | Very Good        | 3    |
| 8                     | My parents give me a lot of freedom.  | 3.82              | Very Good        | 5    |
| 9                     | My parents choose my friends.   | 2.46              | Fair             | 10   |
| 10                    | I trust my parents.   | 4.61              | Excellent        | 1    |
| <b>Composite Mean</b> |   | <b>3.70</b>       | <b>Very Good</b> |      |

### **On Relationship with Peers**

Academic successes and positive peer relations are two primary developmental goals for students at early educational stages. Adjustment in the academic domain is often positively associated with adjustment in the social domain (Ryan, 2000; Wentzel et al., 2017). Student-peer relationships are an important aspect of classroom climate that affect student attitudes, behaviors, and performance in school.

It can be noticed in the result that the respondents have high social relations towards their peers. Their friends understand them well got the highest mean. Being understood by peers is essential throughout one’s social development that is particularly true during adolescence.



**Table 3. Respondents' Level of Social Relations with Peers  
(N = 286)**

| Items     | Statements  | Average (N = 286) |                  |      |
|-----------|---|-------------------|------------------|------|
|           |   | WM                | DV               | Rank |
| <b>B.</b> | <b>RELATIONSHIP WITH PEERS</b>                                      |                   |                  |      |
| 1         | My friends understand me well.                                      | 4.10              | Very Good        | 1    |
| 2         | My friends come to help me whenever I want their help.              | 3.86              | Very Good        | 2    |
| 3         | I share all my problems with my friends.                            | 3.47              | Very Good        | 6    |
| 4         | I feel, I am left out by my friends because of my learning ability. | 3.25              | Good             | 9    |
| 5         | I feel pressured to do something because everyone is doing it.      | 3.26              | Good             | 8    |
| 6         | My friend's attitude influences me a lot.                           | 3.59              | Very Good        | 5    |
| 7         | I feel sad when I am misunderstood by my friends.                   | 3.76              | Very Good        | 4    |
| 8         | My friends encourage and motivate me.                               | 3.78              | Very Good        | 3    |
| 9         | My friends leave me if I don't accept their interest.               | 2.78              | Good             | 10   |
| 10        | I take decisions based on my friend's interests.                    | 3.28              | Good             | 7    |
|           | <i>Composite Mean</i>   | <b>3.51</b>       | <b>Very Good</b> |      |

### On Relationship with Teachers.

The relationship between student and teacher plays a large role in the trajectory of a child's academic success and social development. Establishing a positive relationship with their teacher helps a student feel more comfortable and safe in their classroom environments.

As a result, respondents are more likely to "respect" their teachers. This indicator got the highest weighted mean. This positive result show more engagement in learning, behave better in class and achieve at higher levels academically.

**Table 4. Respondents' Level of Social Relations with Teachers  
(N = 286)**

| Items     | Statements   | Average (N = 286) |                  |      |
|-----------|--|-------------------|------------------|------|
|           |  | WM                | DV               | Rank |
| <b>B.</b> | <b>RELATIONSHIP WITH TEACHERS</b>  |                   |                  |      |
| 1         | My teacher volunteers to help me.  | 4.17              | Very Good        | 3    |
| 2         | I am comfortable in clearing my doubts with teachers.  | 4.02              | Very Good        | 5    |
| 3         | My teachers' knows my interest and talent and they encourage me.                                       | 3.41              | Very Good        | 8    |
| 4         | My parents understand me better, because there is a good relationship between my parents and teachers. | 3.86              | Very Good        | 6    |
| 5         | My teacher criticizes me.  | 3.13              | Good             | 9    |
| 6         | I trust my teacher.  | 4.56              | Excellent        | 2    |
| 7         | I think my teacher believes in my success.   | 4.14              | Very Good        | 4    |
| 8         | I respect my teachers.   | 4.61              | Excellent        | 1    |
| 9         | My teachers punish me.   | 2.30              | Fair             | 10   |
| 10        | I feel comfortable interacting with teacher.   | 3.83              | Very Good        | 7    |
|           | <i>Composite Mean</i>  | <b>3.86</b>       | <b>Very Good</b> |      |

The following table presents the Pearson Product Moment Correlation test between Level of Social Relations and Level of self-Esteem among students. As presented in Table 15, the computed r value of, -0.06925 is greater than the critical value of r which is 0.00324 with 284 df at (0.05) level of significance which resulted to a significant result rejecting the null hypothesis. This means to say that there is a significant degree correlation between level of social relations and self-esteem among students. A closer look at the data would reveal that the higher the students' level of social relations so goes with the level of self-esteem.

**Table 5. Correlation Between Level of Social Relations and Level of Self-Esteem Among Students**

| Students | Level of Social Relations |                | Level of Self-Esteem |                | XY      |
|----------|---------------------------|----------------|----------------------|----------------|---------|
|          | X                         | X <sup>2</sup> | Y                    | Y <sup>2</sup> |         |
| Sum      | 1050                      | 3902.9689      | 790.30               | 2227.7700      | 2898.87 |
| Mean     | 3.67                      |                | 2.76                 |                |         |
| SD       | 0.4044                    |                | 0.3927               |                |         |

r = -0.06925  
 Critical Value of r at 284 df (0.05) = 0.00324  
 Result: Significant  
 Ho : Rejected

## CONCLUSIONS

The level of social relations of students in Danao National High School is very good on relationship with parents, relationship with peers and relationship with teachers. This implies that the students has a very good social skills. There is a significant degree correlation between level of social relations and self-esteem among students. It revealed that the higher the students' level of social relations so goes with the level of self-esteem. It is recommended for the school to implement a program to enhance positive attitude among students.

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# EFFECTIVENESS OF DIGITAL STORYTELLING AS AN INTERVENTION IN ENHANCING PUPILS READING COMPREHENSION

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## ABSTRACT

The main thrust of this study was to determine the effectiveness of digital storytelling in enhancing pupil's reading comprehension in Almaria Elementary School in Anda, Bohol during the School Year 2021-2022. The researchers used the experimental method to identify effect and relation of variables. Purposive sampling technique was used to determine the participants of the study. It was conducted at Almaria Elementary School, Anda, Bohol to Grade 1 and 2 for a total of 24 pupils. The essential elements include controlled techniques and the random assignment of individuals to control and experimental groups. It was hypothesized that there is no significant difference between pupils' level of reading performance in terms of pretest and post-test. The data show that there is no significant difference between the pretest performance of the control and experimental group. Hence, the null hypothesis (Ho) was accepted. Further, there is sufficient evidence of a significant difference between the pretest and post-test performances of the pupils belonging to the experimental group. Likewise, there is a significant difference between the pretest and post-test performances of the pupils belonging to the control group. However, there is no significant difference between the pretest and post-test performances of the pupils belong to the control group. This study concludes the intervention of digital storytelling greatly affect the reading performance of the pupils as to listening comprehension, letter sound knowledge, alphabet knowledge, phonemic awareness, familiar word reading, non-word reading, and reading comprehension. Further, the modular approach in improving reading performance is also effective in selected component or sub-task namely; phonemic awareness, familiar word reading, non-word reading and reading comprehension. However, using modular approach is not effective in improving listening comprehension, letter sound knowledge and alphabet knowledge.

*Keywords: efficacy, digital storytelling, intervention, pretest, posttest, reading comprehension*

## INTRODUCTION

People nowadays use technology both in their academic or personal lives. As such, English language classes are no exception to the inclusion of digital technologies. Within the context of communication, reading is very a significant skill, as it develops cognitive and communicative skills and of course language in a way that enlightening the minds of people (Radaideh, 2020). However, poor reading comprehension remains to be a pressing issue worldwide. In response, the utilization of digital storytelling is recommended. Digital storytelling is an artistic way of telling stories combining audio, video, and images. It has been marked as a distinguished strategy that helps teachers internalize lessons in a way to meet students' various needs (Figg, Gonsoulin, & Mccartney, 2017).

In the Philippines, recent surveys show that poor reading comprehension turns out to be very alarming. In fact, 70 percent of the learners are unable to read text within the expected level as reported by the Department of Education (DepEd). This leads to the formulation of 'Every Child A Reader Pro-

gram” (ECARP) which targets to intensify reading literacy in schools. In this program, students are only advanced to higher grades provided they exhibit mastery of fundamental reading abilities in a given grade. Part of the program is the integration of ICT in teaching, for instance, teachers are encouraged to use digital storytelling to improve reading skills (Estremera, 2018).

Poor reading comprehension is one of the pressings and battled issues in the District of Anda, Bohol wherein students were unable to read and comprehend within the expected level based on the recently conducted reading assessment on EGRA in grades 1 to 3. Teachers in the district are advised to come up with a finite teaching strategy and intervention that would motivate learners to read and intensifies their reading skills. Teachers are making use of digital storytelling wherein copies of stories were given through a USB and google Drive accessible for mobile phones and computers.

This scenario triggers the researcher to undertake this research to determine the efficiency of digital storytelling in enhancing pupil’s reading comprehension. The study's findings might provide the foundation for better reading treatments and instructional techniques to increase reading abilities and reading comprehension.

## **LITERATURE REVIEW**

Reading comprehension is described as "the process of obtaining and building meaning at the same time through interaction and participation with written language" (Snow, 2016). It consists of three parts: "the reader doing the understanding, the text to be comprehended, and the activity in which comprehension is immersed." Similarly, Cain and Oakhill (2016) defined reading as a complex cognitive process that contains inferences, guessing meaning from a text, and integrating information. Anderson (2017) stressed that reading comprehension is the core of language skills that enhances all other language skills and sub-skills. In addition, reading gives individuals the opportunity to learn about science, mathematics, language arts, history, and social studies.

Storytelling is essentially a human experience in which information about oneself, others, or the world is transmitted. Telling a tale is a popular method of educating, gathering information, and providing pleasure. Grace (2016) defined storytelling as a united framework including a distinguished beginning, middle, and end, that provides details in which characters struggle through time, take action, experience emotions and discover meaning. Stories allows human to comprehend ones and other cultures and observe the realm of humans and the world. Significantly, stories allow individuals to acquire skills and knowledge since humans "brain is bound to establish, recall and record in the mind as a narrative all experience and object is accessed through story" (McDrury & Alterio, 2017).

## **STATEMENT OF THE PROBLEM**

The main purpose of the study was to determine the effectiveness of digital storytelling as a reading intervention in enhancing pupil’s reading comprehension of Grades 1 to 2 pupils in Almaria Elementary School in Anda, Bohol during the School Year 2021-2022.

Specifically, it seeks to answer the following questions:

1. What is the profile of the pupil’s in terms of age; sex; grade level; and gadgets available?
2. What is the pupil’s pretest performance in reading in terms of listening comprehension; letter sound knowledge; alphabet knowledge; phonemic awareness; familiar word reading; non-word reading; and reading comprehension?
3. What is the pupil’s post-test performance in reading in terms of listening comprehension; letter sound knowledge; alphabet knowledge; phonemic awareness; familiar word reading; non-word reading; and reading comprehension?
4. Is there a significant difference between the pretest performance of the pupils belong to the control and experimental group per reading sub-task?
5. Is there a significant difference between the pretest and post-test performance of the pupils belong to the control and experimental group per reading sub-task?
6. Is there a significant difference between the post-test performance of the pupils belong to the control and experimental group?

The hypotheses of the study were: there is no significant difference between the pretest performance of the pupils belong to the control and experimental group per reading sub-task; there is no significant difference between the pretest and post-test performances of the pupils belong to the control and experimental group per reading sub-task; and there is no significant difference between the post-test performance of the pupils belong to the control and experimental group.

## RESEARCH METHODOLOGY

The researchers used two sets of questionnaires specifically for this study. The first set is a survey questionnaire of the pupil respondents' profiles such as age, sex, grade level, and gadgets available.

The second set is on the reading comprehension of the pupils. For reading comprehension, the Division Contextualized Early Grade Reading Assessment tool was utilized. This tool is only use for Grades I, II and III. It is composed of seven (7) sub-tasks namely: listening comprehension, letter sound knowledge, alphahabet knowledge, phonemic awareness, familiar word-reading, non-familiar word reading and reading comprehension. Each component has each own task that the pupils have to take to measure the pupil's reading performance. Lastly, each component has different test items which the pupils have to finish within a particular time. Correlation Coefficient was used as the statistical treatment.

In the conduct of the pre-test and post-test reading assessment, face-to-face was held but each learner had a specific schedule. However, others were through phone calls with learners with mobile phones. After the reading assessment, copies of digitized stories were provided through online links to be downloaded. Others were through offline sharing mobile applications from the teacher.

## RESULTS AND DISCUSSIONS

This chapter presents the data which comprised the profile of the pupils, the level of reading performance in pre-test and the level of reading performance in post-test during the School Year 2021 – 2022.

The data gathered were tallied and presented in tabulated and textual form, analyzed through the use of statistical formula and interpreted in the light of the problems posted by this study. Thus, adding empirical data.

Table 1 illustrates the profile of the pupil – respondents including age, sex, grade level, and gadgets available. It is reflected in the table that the highest frequency as to age is 7 with a frequency of 15 or 62.50 % of the total sample size. Age 7 has the lowest frequency with 1 or 4.16% of the sample size. It can be elucidated from the data that mostly of the respondents were considered as middle childhood wherein the acquisition of reading skills is crucial in this stage. As early as 7, there is a need that reading skills must be developed. In this stage, pupils' starts to read familiar stories, sound out or decode unfamiliar words, show comprehension and write by organizing details into logical sequence.

This is parallel with the enrolment profile of Almaria Elementray School, Anda District School Year 2021 – 2022 in Grades 1 and 2.

In terms of sex, it reveals that most of the respondents were dominated by males with a frequency of 14 or 58.33%. In contrast, there were 10 or 41.67% females. This is in conjunction with the trend since then that Almaria Elementary School has been consistently dominated by male pupils.

**Table 1. Profile of the Pupil-Respondents**  
N = 24

| Age            | Frequency | Percentage (%) |
|----------------|-----------|----------------|
| 6 years old    | 8         | 33.00          |
| 7 years old    | 15        | 62.50          |
| 8 years old    | 1         | 4.16           |
| <b>Total</b>   | <b>24</b> | <b>100</b>     |
| <b>1.2 Sex</b> |           |                |
| Male           | 14        | 58.33          |
| Female         | 10        | 41.67          |
| <b>Total</b>   | <b>24</b> | <b>100</b>     |

| Grade Level       |           |            |
|-------------------|-----------|------------|
| Grade 1           | 10        | 41.67      |
| Grade 2           | 14        | 58.33      |
| <b>Total</b>      | <b>24</b> | <b>100</b> |
| Gadgets Available |           |            |
| Cable T.V.        | 18        | 24.00      |
| Non-Cable T.V.    | 6         | 8.00       |
| Basic Cellphone   | 4         | 5.33       |
| Smartphone        | 24        | 32.00      |
| Tablet            | 1         | 1.33       |
| Radio             | 20        | 26.67      |
| Desktop Computer  | 1         | 1.33       |
| Laptop            | 1         | 1.33       |
| <b>Total</b>      | <b>75</b> | <b>100</b> |

As to respondent's grade level, the table displays that most of the respondents participated were Grade 2 pupils with a frequency of 14 or 58.33% of the total respondents. There were 10 Grade 1 pupils or 41.67% who were respondents of the study. The percentage distribution is the actual reflection of the pupil-population (as to year level) of Grades 1 and 2 in Almaria Elementary School during the School Year 2021 – 2022.

Moreover, as to gadgets available, most of the pupil-respondents responded on smartphone with a total frequency of 24 or 32.00%. However, tablet, desktop computer and laptop got the lowest frequency of 1 or 1.33% of the total responses. Meaning to say, that these pupil-participants have the available gadgets needed for the intervention.

It can be gleaned from the Table 2 the pupil's pretest reading performance of both control and experimental group in every sub-task. The control group used the modular approach while the experimental group utilized the digital storytelling as an intervention to reading performance.

As to listening comprehension, the control group has a 100.00% passing frequency of 12 while the experimental group follows the same result of 100.00% or 12. On letter sound knowledge, only 58.33% or 7 out of 12 passed and 41.67% or 5 failed on the said component for control group. On the other hand, on the same component, 4 or 33.33% passed and 66.67% or 8 failed for experimental group.

As to alphabet knowledge, the control group has an equal result wherein both passed and failed generates 50.00% or a frequency of 6. In contrast, the experimental group has 58.33% or 7 failures while only 5 or 41.67% passed the said component.

**Table 2. Pupils' Pretest Reading Performance**  
N<sub>1</sub> = 12; N<sub>2</sub> = 12

| Sub-task                    | Performance | Correct Responses | Control Group (N <sub>1</sub> ) |       |      | Experimental Group (N <sub>2</sub> ) |       |
|-----------------------------|-------------|-------------------|---------------------------------|-------|------|--------------------------------------|-------|
|                             |             |                   | F                               | %     | Rank | F                                    | %     |
| 2.1 Listening Comprehension | Passed      | 3 – 4             | 12                              | 100   | 1    | 12                                   | 100   |
|                             | Failed      | 0 – 2             | 0                               | 0.00  | 0    | 0                                    | 0.00  |
| 2.2. Letter Sound Knowledge | Passed      | 27 – 36           | 7                               | 58.33 | 1    | 4                                    | 33.33 |
|                             | Failed      | 1 – 26            | 5                               | 41.67 | 2    | 8                                    | 66.67 |
| 2.3. Alphabet Knowledge     | Passed      | 27 – 36           | 6                               | 50.00 | 1.5  | 5                                    | 41.67 |
|                             | Failed      | 1 – 26            | 6                               | 50.00 | 1.5  | 7                                    | 58.33 |
| 2.4. Phonemic Awareness     | Passed      | 3 – 4             | 12                              | 100   | 1    | 12                                   | 100   |
|                             | Failed      | 0 – 2             | 0                               | 0.00  | 0    | 0                                    | 0.00  |
| 2.5. Familiar Word Reading  | Passed      | 15 - 20           | 3                               | 25.00 | 2    | 3                                    | 25.00 |
|                             | Failed      | 1 – 14            | 9                               | 75.00 | 1    | 9                                    | 75.00 |
| 2.6. Non-Word Reading       | Passed      | 15 - 20           | 2                               | 16.67 | 2    | 2                                    | 16.67 |
|                             | Failed      | 1 – 14            | 10                              | 83.33 | 1    | 10                                   | 83.33 |
| 2.7. Reading Comprehension  | Passed      | 3 – 4             | 2                               | 16.67 | 2    | 2                                    | 16.67 |
|                             | Failed      | 0 – 2             | 10                              | 83.33 | 1    | 10                                   | 83.33 |
| Overall Performance         | Reader      | 2.1 - 2.7         | 2                               | 16.67 | 2    | 2                                    | 16.67 |
|                             | Non-reader  | 2.1 - 2.4         | 10                              | 83.33 | 1    | 10                                   | 83.33 |

In terms of phonemic awareness, both the control and experimental groups scored 100.00%. However, on familiar word reading, 75.00% failed or 9 out of 12 compared to just 25.00% or 3 out of 12 of the entire sample size for the control group. The experimental group had the same result, 75.00% failed or 9 out of 12 and 25.00% failed or 3.

For non-familiar word reading, 83.33% or 10 failed, whereas only 16.67% or 2 succeeded in the control group. In the experimental group, 83.33% or 10 failed the evaluation, while just 16.67% or 3 passed.

Finally, on reading comprehension 83.33% or 10 failed and 16.67% or 2 passed for control group. On the other hand, 83.33% or 10 failed and 16.67% or 2 passed the particular component for experimental group.

As to the overall result, based on the number/ percentage of passed and failed on each component, there were 83.33% or 10 non-readers and only 16.67% or 2 considered readers for the control group. On the other hand, 83.33% or 10 were considered non-readers and 16.67% or 2 readers on the experimental group.

Table 3 displays the pupils' post test reading performance both in control and experimental group in each component. As to listening comprehension, both control and experimental group has a 100.00% passing frequency with 12 and 12, respectively.

In letter sound knowledge, 9 or 75.00% passed and only 3 or 25.00% failed for the control group. In contrast, 12 or 100.00% passed for the experimental group. For alphabet knowledge, 8 or 66.67% passed and 4 or 33.33% failed for the control group. However, the experimental group has 100.00% or 12 passed on this component.

**Table 3. Pupils' Posttest Reading Performance**  
N<sub>1</sub> = 12; N<sub>2</sub> = 12

| Sub-task                    | Performance | Correct Responses | Control Group (N <sub>1</sub> ) |       |      | Experimental Group (N <sub>2</sub> ) |       |      |
|-----------------------------|-------------|-------------------|---------------------------------|-------|------|--------------------------------------|-------|------|
|                             |             |                   | F                               | %     | Rank | F                                    | %     | Rank |
| 2.1 Listening Comprehension | Passed      | 3 – 4             | 12                              | 100   | 1    | 12                                   | 100   | 1    |
|                             | Failed      | 0 – 2             | 0                               | 0     | 2    | 0                                    | 0     | 2    |
| 2.2. Letter Sound Knowledge | Passed      | 27 – 36           | 9                               | 75.00 | 1    | 12                                   | 100   | 1    |
|                             | Failed      | 1 – 26            | 3                               | 25.00 | 2    | 0                                    | 0     | 2    |
| 2.3. Alphabet Knowledge     | Passed      | 27 – 36           | 8                               | 66.67 | 1    | 12                                   | 100   | 1    |
|                             | Failed      | 1 – 26            | 4                               | 33.33 | 2    | 0                                    | 0     | 2    |
| 2.4. Phonemic Awareness     | Passed      | 3 – 4             | 12                              | 100   | 1    | 12                                   | 100   | 1    |
|                             | Failed      | 0 – 2             | 0                               | 0     | 2    | 0                                    | 0     | 2    |
| 2.5. Familiar Word Reading  | Passed      | 15 – 20           | 6                               | 50.00 | 1.5  | 10                                   | 83.33 | 1    |
|                             | Failed      | 1 – 14            | 6                               | 50.00 | 1.5  | 2                                    | 16.67 | 2    |
| 2.6. Non-Word Reading       | Passed      | 15 – 20           | 6                               | 50.00 | 1.5  | 10                                   | 83.33 | 1    |
|                             | Failed      | 1 – 14            | 6                               | 50.00 | 1.5  | 2                                    | 16.67 | 2    |
| 2.7. Reading Comprehension  | Passed      | 3 – 4             | 6                               | 50.00 | 1.5  | 10                                   | 83.33 | 1    |
|                             | Failed      | 0 – 2             | 6                               | 50.00 | 1.5  | 2                                    | 16.67 | 2    |
| Overall Performance         | Reader      | 2.1 – 2.7         | 6                               | 50.00 | 1.5  | 10                                   | 83.33 | 1    |
|                             | Non-reader  | 2.1 – 2.4         | 6                               | 50.00 | 1.5  | 2                                    | 16.67 | 2    |

For phonemic awareness, 12 or 100.00% passed in the the control group while the experimental group follows the same result of 12 or 100.00% passed. As to familiar word reading, 6 or 50.00% failed and 6 or 50.00% passed in the control group while 10 or 83.33% passed in the experimental group and 16.67% or 2 failed.

In addition, familiar word reading, non-familiar word reading and reading comprehension had the same result in the control group, 6 or 50.00% passed and 6 or 50.00% failed. However, on the experimental group, familiar word reading, non-familiar word reading and reading comprehension follows the same result of 83.33% passed or 10 out of 12 and 16.67% or 2 failed on those three constructs.

Based on the number of passed and failed, it can be elucidated from the table that 6 or 50.00% were readers and non-reader in the control group. In contrast, 10 or 83.33% were readers and only 16.67% or 2 were non-readers in the experimental group.

Meaning, there was an increase on the number of readers on the posttest of the pupils in both the control group more significantly in the experimental group.

Table 4 illustrates the test of difference between the pretest performance of the control and experimental group as to listening comprehension, letter sound knowledge, alphabet knowledge, phonemic awareness, familiar word reading, non-word reading, and reading comprehension.

**Table 4. Test of Difference Between the Pretest Performance of the Control and Experimental Group Per Reading Sub-Task**  
N<sub>1</sub> = 12; N<sub>2</sub> = 12

| Sub-task                | Mean Scores   |                    | Mean Difference | T     | p-value | Interpretation  | Decision                     |
|-------------------------|---------------|--------------------|-----------------|-------|---------|-----------------|------------------------------|
|                         | Control Group | Experimental Group |                 |       |         |                 |                              |
| Listening Comprehension | 3.75          | 3.71               | 0.042           | 0.256 | 0.800   | Not Significant | Do Not Reject H <sub>0</sub> |
| Letter Sound Knowledge  | 23.92         | 23.00              | 0.917           | 0.405 | 0.689   | Not Significant | Do Not Reject H <sub>0</sub> |
| Alphabet Knowledge      | 26.00         | 24.96              | 1.042           | 0.448 | 0.657   | Not Significant | Do Not Reject H <sub>0</sub> |
| Phonemic Awareness      | 3.67          | 3.63               | 0.042           | 0.239 | 0.813   | Not Significant | Do Not Reject H <sub>0</sub> |
| Familiar Word Reading   | 11.75         | 11.25              | 0.500           | 0.348 | 0.730   | Not Significant | Do Not Reject H <sub>0</sub> |
| Non-Word Reading        | 10.25         | 10.08              | 0.167           | 0.097 | 0.923   | Not Significant | Do Not Reject H <sub>0</sub> |
| Reading Comprehension   | 2.25          | 2.13               | 0.125           | 0.403 | 0.691   | Not Significant | Do Not Reject H <sub>0</sub> |

*\*Difference is significant at 0.05 (2-tailed)*

The result revealed that there is no significant difference between the pretest performance of the control and experimental group as to listening comprehension,  $t(34)=0.256$ ,  $p=0.800$ , letter sound knowledge,  $t(34)=0.405$ ,  $p=0.689$ , alphabet knowledge,  $t(34)=0.448$ ,  $p=0.657$ , phonemic awareness,  $t(34)=0.239$ ,  $p=0.813$ , familiar word reading,  $t(34)=0.348$ ,  $p=0.730$ , non-word reading,  $t(34)=0.097$ ,  $p=0.923$ , and reading comprehension,  $t(34)=0.403$ ,  $p=0.691$ , thus failed to reject the null hypothesis. This means that the pretest results obtained by both groups are closely related.

Table 5 shows the test of difference between the pretest and post test performances of the control and experimental group as to listening comprehension, letter sound knowledge, alphabet knowledge, phonemic awareness, familiar word reading, non-word reading, and reading comprehension. The result deduced that there is a sufficient evidence of a significant difference between the pretest and post test performances of the pupils belong to the experimental group as to listening comprehension,  $t(23)=3.077$ ,  $p=0.005$ , letter sound knowledge,  $t(23)=8.695$ ,  $p<.001$ , alphabet knowledge,  $t(23)=7.829$ ,  $p<.001$ , phonemic awareness,  $t(23)=3.715$ ,  $p=0.001$ , familiar word reading,  $t(23)=11.563$ ,  $p<.001$ , non-word reading,  $t(23)=9.805$ ,  $p<.001$ , and reading comprehension,  $t(23)=7.882$ ,  $p<.001$ , thus reject the null hypothesis. This infers that the intervention digital storytelling greatly affects the reading performance of the pupils as to listening comprehension, letter sound knowledge, alphabet knowledge, phonemic awareness, familiar word reading, non-word reading, and reading comprehension.

**Table 5. Test of Difference Between the Pupils' Pretest and Posttest Performances of the Control and Experimental Group Per Reading Sub-Task**  
N<sub>1</sub> = 12; N<sub>2</sub> = 12

| Sub-task                | Group        | Mean Scores |           | T     | p-value | Interpretation  | Decision                     |
|-------------------------|--------------|-------------|-----------|-------|---------|-----------------|------------------------------|
|                         |              | Pre test    | Post test |       |         |                 |                              |
| Listening Comprehension | Control      | 3.75        | 3.83      | 0.561 | 0.586   | Not Significant | Do Not Reject H <sub>0</sub> |
|                         | Experimental | 3.71        | 4.00      | 3.077 | 0.005   | Significant     | Reject H <sub>0</sub>        |
| Letter Sound Knowledge  | Control      | 23.92       | 27.00     | 2.056 | 0.064   | Not Significant | Do Not Reject H <sub>0</sub> |
|                         | Experimental | 23.00       | 24.00     | 8.695 | <.001   | Significant     | Reject H <sub>0</sub>        |
| Alphabet Knowledge      | Control      | 26.00       | 28.00     | 1.404 | 0.188   | Not Significant | Do Not Reject H <sub>0</sub> |
|                         | Experimental | 24.96       | 32.58     | 7.829 | <.001   | Significant     | Reject H <sub>0</sub>        |



|                       |              |       |       |        |       |             |                       |
|-----------------------|--------------|-------|-------|--------|-------|-------------|-----------------------|
| Phonemic Awareness    | Control      | 3.67  | 3.33  | 2.345  | 0.039 | Significant | Reject H <sub>0</sub> |
|                       | Experimental | 3.63  | 4.00  | 3.715  | 0.001 | Significant | Reject H <sub>0</sub> |
| Familiar Word Reading | Control      | 11.75 | 13.92 | 3.072  | 0.011 | Significant | Reject H <sub>0</sub> |
|                       | Experimental | 11.25 | 17.00 | 11.563 | <.001 | Significant | Reject H <sub>0</sub> |
| Non-Word Reading      | Control      | 10.25 | 15.08 | 4.768  | 0.001 | Significant | Reject H <sub>0</sub> |
|                       | Experimental | 10.08 | 17.50 | 9.805  | <.001 | Significant | Reject H <sub>0</sub> |
| Reading Comprehension | Control      | 2.25  | 2.58  | 2.345  | 0.039 | Significant | Reject H <sub>0</sub> |
|                       | Experimental | 2.13  | 3.54  | 7.882  | <.001 | Significant | Reject H <sub>0</sub> |

*\*Difference is significant at 0.05 (2-tailed)*

Likewise, there is a significant difference between the pretest and post test performances of the pupils belong to the control group as to phonemic awareness,  $t(11)=2.345$ ,  $p=0.039$ , familiar word reading,  $t(11)=3.072$ ,  $p=0.011$ , non-word reading,  $t(11)=4.768$ ,  $p=0.001$ , and reading comprehension,  $t(11)=2.345$ ,  $p=0.039$ , thus the null hypothesis is rejected. This means that using the modular approach in improving reading performance is also effective in selected component or sub-task namely; phonemic awareness, familiar word reading, non-word reading and reading comprehension.

However, there is no significant difference between the pretest and posttest performances of the pupils belong to the control group as to listening comprehension,  $t(11)=0.561$ ,  $p=0.586$ , letter sound knowledge,  $t(11)=2.056$ ,  $p=0.064$ , alphabet knowledge,  $t(11)=1.404$ ,  $p=0.188$ , thus failed to reject the null hypothesis. This denotes that using modular approach is not effective in improving reading performance particularly in listening comprehension, letter sound knowledge and alphabet knowledge.

Several studies anchors and follows the same trend that adopting digital storytelling improves children's listening comprehension, alphabet and letter-sound knowledge and read familiar and unfamiliar words contributing in enhancing reading performance. This includes the study of Alshrari (2017), investigated the impact of digital storytelling on the reading performance. The results showed that students in the experimental group who were taught via digital storytelling performed better on listening comprehension, alphabet and letter-sound knowledge and read familiar and unfamiliar words contributing in enhancing reading performance than pupils in the control group who were taught using traditional methods.

The same trend for Qoura (2016), Apriltya, Régina, and Arifin (2016) and Dewi (2017) that studied the effect of digital storytelling on student are reading performance. The findings revealed that using digital storytelling has a significant impact on the reading performance of students. The findings showed that digital storytelling is an appropriate and interesting strategy in improving reading performance of pupils.

Table 6 discloses the test of difference between the post test performance of the pupils belong to the control and experimental group as to listening comprehension, letter sound knowledge, alphabet knowledge, phonemic awareness, familiar word reading, non-word reading, and reading comprehension. The result shown that there is sufficient evidence of a significant difference between the pretest performance of the control and experimental group as to letter sound knowledge,  $t(34)=4.480$ ,  $p<.001$ , alphabet knowledge,  $t(34)=4.519$ ,  $p<.001$ , phonemic awareness,  $t(34)=4.690$ ,  $p=0.001$ , familiar word reading,  $t(34)=3.304$ ,  $p=0.002$ , non-word reading,  $t(34)=2.231$ ,  $p=0.036$ , and reading comprehension,  $t(34)=3.049$ ,  $p=0.004$ , thus reject the null hypothesis. This implies that the intervention digital storytelling is effective in enhancing the reading performance of the pupils compared to the use of modular approach in teaching reading.

**Table 6. Test of Difference Between the Post test Performance of the Control and Experimental Group Per Reading Sub-Task**  
N = 12

| Sub-task                | Mean Scores |              | Mean Difference | t     | P-value | Interpretation  | Decision                     |
|-------------------------|-------------|--------------|-----------------|-------|---------|-----------------|------------------------------|
|                         | Control     | Experimental |                 |       |         |                 |                              |
| Listening Comprehension | 3.83        | 4.00         | 0.167           | 1.483 | 0.166   | Not Significant | Do Not Reject H <sub>0</sub> |
| Letter Sound Knowledge  | 27.00       | 30.75        | 3.750           | 4.480 | <.001   | Significant     | Reject H <sub>0</sub>        |
| Alphabet Knowledge      | 28.00       | 32.58        | 4.583           | 4.519 | <.001   | Significant     | Reject H <sub>0</sub>        |
| Phonemic Awareness      | 3.33        | 4.00         | 0.667           | 4.690 | 0.001   | Significant     | Reject H <sub>0</sub>        |
| Familiar Word Reading   | 13.92       | 17.00        | 3.083           | 3.304 | 0.002   | Significant     | Reject H <sub>0</sub>        |
| Non-Word Reading        | 15.08       | 17.50        | 2.417           | 2.231 | 0.036   | Significant     | Reject H <sub>0</sub>        |
| Reading Comprehension   | 2.58        | 3.54         | 0.958           | 3.049 | 0.004   | Significant     | Reject H <sub>0</sub>        |

*\*Difference is significant at 0.05 (2-tailed)*

The result of the study is similar to the study of Choo, Li, Redzuan, and Shamsuddin (2017), Hamdy (2017), Anggeraini and Afifah (2017), Alkhilili (2018) and Adgüzel and Kumkale (2018) investigated the effect and influence of digital storytelling in enhancing the reading performance of the pupils. The findings indicated that digital tales had a favorable influence and improved pupils' reading ability and performance.

According to Robin (2018), teachers could design digital stories to find them helpful and facilitating discussion. It also helps to make content more understandable. Embracing digital stories can be used for enhancing lessons. This facilitates discussion of the story topics. In addition, he further asserts, digital stories could be personal stories, informing or instructing stories, and re-telling historical events stories. Personal stories deal with the author's life.

## CONCLUSION

This study concludes that digital storytelling greatly helps in enhancing the reading comprehension of the pupils as to listening comprehension, letter sound knowledge, alphabet knowledge, phonemic awareness, familiar word reading, non-word reading, and reading comprehension. Further, the modular approach, strategy used by the pupils in the control group is also effective in improving pupil's phonemic awareness, familiar word reading, non-word reading and reading comprehension. However, modular approach is not effective in improving listening comprehension, letter sound knowledge and alphabet knowledge.

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# RELATIONSHIP BETWEEN MEDIA VIOLENCE EXPOSURE AND STUDENTS' LEVEL OF AGGRESSION

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## ABSTRACT

The main objective of this study was to determine the relationship between the media violence exposure and level of aggression of Grade VI pupils in Ubay II District, Ubay, Bohol. The descriptive-correlational was used to gather data. The study also used purposive sampling, considering that the chosen population were targeted for the purpose especially in gathering reliable data. The Aggression questionnaire from Buss and Perry (1992) was adopted to gather data on relevant aspects of the study answered by the respondents. The findings showed that television was used by all respondents. In addition, majority of them exposed with immorality shows. In terms of respondents' level of aggression, anger was mostly experienced due to the exposure of media violence and violent aggressiveness was observed. It can be concluded that respondents had less exposure on other program and sites except on television with morality issues. It also prejudiced behavior in such a way that prompts respondents' anger, and hostility influenced by jealousy. Respondents' physical aggressions are prompted due to the protection of their own rights while verbal aggression is provoked when people around them tend to disagree. The age and sex of the respondents does not exert influence on the level of aggression. Furthermore, there is sufficient evidence that level of media violence exposure affects the aggressiveness of the individual.

*Keywords: Media violence, level of aggression, relationship of aggression and violence*

## INTRODUCTION

In our modern society, social environment was changing because of the media. In this new environment, radio, television, movies, videos, video games, and computer networks have assumed central roles in our daily lives. For better or for worse, the mass media are having an enormous impact on our values, beliefs, and behaviours. There is a relationship between the values that shape the technological design and administration of social media. Research evidence has accumulated over many years that exposure to violence on television and in video games increases the risk of violent behaviour on the viewer's part just as growing up in an environment filled with real violence (Onwukne, et al., 2017).

A study made by Osorio (2019), Filipino school children gives more attention and hours using mobile phones, computers and tablets than watching television and radio. Some programs contain heavy themes on violence, death, sex, extramarital affairs, drugs and revenge. It is very clear that there are too few child-friendly programs available on free TV unlike in the past years when kids can watch educational programs in media. Parents understand that children are now being drawn to online media and video gaming. Even if they are aware of the dangers and risks of media, majority does not orient their children; least setup online security on social networking sites. This has been a controversial issue whereby people have presented different views on whether media affects one's level of aggression and violence. Some claim that exposure to media violence causes children and youth to behave more aggressively and affects them as adults years later, while others argue that the scientific evidence simply does not show that watching violence either produces violence in people, or desensitizes them to it. Although

media violence is particularly tough to characterize and evaluate, family attitudes and social category are stronger determinants of attitudes toward aggression than is the amount of disclosure to TV, which is all the same a significant but weaker predictor.

It is now a universal truth that exposure to the media violence may be especially problematic in late adolescence. Television and other media play a major role in adolescent socialization and identity development by providing perspectives, values, ideologies, and behavior models. According to Dhiaa and Tawfeeq (2016), approximately 90% of children in the U.S. play video games, and more than 90% of those games involve mature content that often includes violence and 29% of gamers are under 18 years. As one of the Elementary teachers in the Ubay II District, the study on media violence exposure and student level of aggression could be one of the most significant investigations in searching for some solutions in helping pupils aware from any violence and develop a better understanding of how individuals feel about media violence. As observed and experienced, some students are aggressive and violent in the classroom. This encourages the researcher to find out the possible causes as to their exposure in different media.

## LITERATURE REVIEW

Today, our life will remain incomplete without media. In general, “media” refers to the tools of mass communication. It consists of television, Internet, cinema, newspapers, radio, magazines, direct mail, fax, and the telephone. Some form of pictorial representation of messages can be seen through certain types of broadcasting and advertising. Images are visual representations, pictures, graphics, and include video, movies. Images are very useful in media to help get across messages effectively.

On the other hand, mass media can at times have a negative influence. Violence in the media does increase the risk and negative effect of many people behaving aggressively. Some media tools like television, gadgets, radio, newspapers and computers should be used with limitations and without the proper care and support of parents, children or teenagers may turn into repressive, and this aggressiveness and negativism will surely pass into the next generation (Fikkers, et al., 2017).

Human aggression is any act that is intended to harm another person who does not want to be harmed (Bushman & Anderson, 2015). Moreover, aggressive and violent acts are found everywhere from different media shows featuring real people, cartoon or animated characters. Many researchers define violence as aggression until it comes up into a goal of extreme physical harm, such as injury or death. This study gives an example in which child intentionally pushing another off a tricycle is an act of aggression, but not an act of violence; a person intentionally hitting, kicking, shooting, or stabbing another person is an act of violence. It shows that all violent acts are aggressive acts, but not all aggressive acts are violent—only those intended to cause extreme physical harm.

Evidence is steadily accumulating that prolonged exposure to violent TV programming during childhood is associated with subsequent aggression (Asghari, et al., 2016). In their Perspective, Anderson and Bushman discuss new work (Johnson et al.) that clearly demonstrates this association in adolescents and young adults, thus broadening the range of individuals affected by media violence.

The findings of the study of Jones (2018) indicated that, trait anger has a direct positive effect on hostility as well as both direct positive effects on verbal and physical aggression. In addition, one can see the positive indirect effects of trait anger on verbal and physical aggression as mediated by hostility. The data found in this study implies that how video games and other violence in media could very well be the causes for increased hostility. Trait anger is a driving force behind hostility in young children and adults, particularly those who play video games and watch different media violence. Violence is disastrous, having negative effects for both the individual and society. For the individual, observed violence can increase hostile cognitions and aggressive tendencies, and thus decrease socially cooperative behavior. For society, its effects may be even more devastating, as observed violence can potentially be internalized and manifested as performed violence. As revealed by Bushman (2016), three hostile biases can influence appraisal and decision processes: (i) hostile attribution bias; (ii) hostile perception bias; and (iii) hostile expectation bias. The hostile attribution bias is the tendency to perceive ambiguous actions by others as aggressive. For example, if a person bumps into you, a hostile attribution would be that the person did it on purpose to harm you. The hostile perception bias is the tendency to perceive ambiguous social interactions as being aggressive. For example, if you see two people having a conversation, a hos-

tile perception would be that they are arguing or getting ready to fight. The hostile expectation bias is the tendency to assume that people will react to potential conflicts with aggression. For example, if you bump into another person, a hostile expectation would be that the person will assume that you did it on purpose and will attack you in return. The present meta-analysis investigates whether exposure to violent media is related to these three hostile biases.

Based on the study of Siddiqui & Singh (2016), exposure of children to extreme political violence may have substantial effects in increasing externalizing behaviors. The social-cognitive information-processing model for the development of aggression emphasizes the role of observational learning in teaching the child scripts for how to behave, schemes about the kind of world in which they live, and normative beliefs about what is appropriate and inappropriate. Imitation is now recognized as perhaps the most powerful learning mechanism of all for children acquiring social behaviors. However, what a child learns from what the child observes depends crucially on the child's interpretations of what the child sees.

This study also made use of Social Learning Theory by Albert Bandura. According to Ozçelik (2017), an individual learns by observing the behaviour of the model and the information follows the cognitive processing. Thus, in video gaming, users learn aggression as they motivate themselves with energy in the enactment of the behaviour. Crime and violence showed in other media tools increase aggressive behaviour, crime and hostility to enormous extent of many young people. It is mostly learnt and imitated from the environment in which child lives.

## **OBJECTIVES**

The main purpose of this study was to determine the relationship between the media violence exposure and level of aggression of Grade VI pupils in Ubay II District, Ubay, Bohol during the academic year 2019-2020.

Specifically, the study sought to answer the following questions:

1. What is the profile of the respondents in terms of age; sex; and media tool used?
2. What is the level of exposure of the respondents to media violence?
3. What is the level of aggression of the respondents in terms of anger; hostility; physical aggression; and verbal aggression?
4. Is there significant relationship between respondents' level of aggression and their demographic profile as to age; and sex?
5. Is there a significant relationship between the level of media violence exposure to pupil's level of aggression as to anger; hostility; physical aggression; and verbal aggression?

## **RESEARCH METHODOLOGY**

The study is quantitative in nature. It is quantitative for it made use of descriptive-correlational on the pupils' way of using different media during the school year 2019-2020. This study also employed purposive sampling, considering that the chosen population were targeted for the purpose.

The category type of each school was the basis of the sample size. The research subjects of the study were 20 Grade VI students from each medium school namely: Benliw Elementary School, Biabas Central, Sinandigan, Tipolo and Union Elementary School while 10 each are from small schools like Cagting Elementary School, Cuya, Guintaboan, Imelda, Juagdan, San Vicente and Tintinan Elementary School in Ubay II District in Bohol during the academic year 2019-2020.

The researcher chose the Grade 6 pupils to answer the questionnaire because they are responsible enough to understand and answer the given questions for them.

A questionnaire was adopted from the study of Buss and Perry (1992) entitled "Personality and Social Psychology" on aggression. It was made up of three categories: Part I, shows the pupils' demographic profile or personal information of the respondents such as their name, age, sex, and respondents' media tool used, followed by Part II which composed of level of media violence exposure while, Part III is all about aggression questions that is answerable using the 5-point scale shown below, indicate how

uncharacteristic or characteristic each of the following statements is in describing the respondents were categorized as Extremely describes me, Somewhat describes me, Neither describes nor not describes me, Somewhat not describes me, Extremely not describes me with weight equivalent of 5, 4, 3, 2, 1.

## RESULTS AND DISCUSSIONS

Table 1 illustrates that in terms of age, majority (95 or 55.58%), of the respondents were 11 years old. This simply implies that most of the respondents that used different media tools fall to the youngest age among Grade 6 pupils.

With regards to sex, it was reflected in the table that female respondents are of highest frequency with ninety-three (54.71%) compared to the male respondents which composed only of seventy-seven (45.29%), from the total population surveyed.

As to their media tool used, there is clear evidence from the table that item “television” has the highest percentage of 100%. This indicates that all of the Grade 6 respondents are exposed to television than mobile cell phone.

**Table 1. Profile of the Respondents**  
N = 170

| Age                    | F   | (%)   | Rank |
|------------------------|-----|-------|------|
| 11 years old           | 95  | 55.88 | 1    |
| 12 years old           | 62  | 36.47 | 2    |
| 13 years old           | 7   | 4.12  | 3    |
| 14 years old           | 4   | 2.35  | 4    |
| 15 years old           | 2   | 1.18  | 5    |
| <b>Total</b>           | 170 | 100%  |      |
| <b>Sex</b>             |     |       |      |
| Male                   | 77  | 45.29 | 2    |
| Female                 | 93  | 54.71 | 1    |
| <b>Total</b>           | 170 | 100%  |      |
| <b>Media tool used</b> |     |       |      |
| Cellphone              | 138 | 81.18 | 2    |
| Computer/laptop        | 18  | 10.59 | 5    |
| Newspaper              | 35  | 20.59 | 4    |
| Radio                  | 53  | 31.18 | 3    |
| Television             | 170 | 100   | 1    |

Majority (83.70%) of the children still prefer and access television programs through a television set. On the average, children watch television close to three (3) hours per day during weekdays and six (6) hours during weekends. On weekdays, half of the children surveyed watch television shows at most two (2) hours a day, and the other half is exposed to television shows for more than two (2) hours. On weekends, half of the respondents watch television shows less than five (5) hours a day, and the other half watch for more than five (5) hours. It was recorded that 5 percent of the children do not watch television on weekdays, while 3 percent do not watch television on weekends. A little more than half of the children (51.50%) said they have a cable connection on their television set; this means they have access to a wider range of channels and television programs. Almost 49 percent of the children surveyed have access only to free-television channels (no cable connection).



**Table 2. Level of Exposure to Media Violence**  
N = 170

| Statement I am exposed to.....  | WM          | DI                  |
|---|-------------|---------------------|
| television with immorality shows  | 2.62        | ME                  |
| action movies   | 2.48        | LE                  |
| news about tragedy, calamities and crime  | 2.16        | LE                  |
| social networking sites like facebook from any bullying and negative public post and comments and other dating sites with strangers | 2.05        | LE                  |
| video streaming sites with negative influence and fear videos   | 2.08        | LE                  |
| computer games that involve war and revenge that cause bullying and suicide because of involvement                                  | 1.37        | NE                  |
| mobile games that shows killing and violent behaviour   | 1.80        | LE                  |
| negative or scary headline from newspaper or even information and jokes written that can be learned by anyone                       | 1.26        | NE                  |
| <b>Composite Mean</b>   | <b>1.98</b> | <b>Less Exposed</b> |

Parameters:  
 1.00-1.74 NE No Exposure  
 1.75-2.49 LE Less Exposed  
 2.50-3.24 ME Moderately Exposed  
 3.25-4.00 HE Highly Exposed

Table 2 illustrates that statement no. 1 “television with immorality shows” ranked first with a weighted mean of 2.62 (Moderately Exposed). However, statement no.8 “negative or scary headline from newspaper or even information and jokes written that can be learned by anyone” has the least mean of 1.26 (No Exposure).

Generally, it illustrates that level of exposure to media violence has a composite mean of 1.98 (Less Exposed).

**Table 3. Respondents’ Level of Aggression**  
N = 170

| Category                      | WM          | DV  | Rank |
|-------------------------------|-------------|---|------|
| Anger                         | 2.74        | Neither describes nor not describes me        | 1    |
| Hostility                     | 2.70        | Neither describes nor not describes me        | 2    |
| Physical Aggression           | 2.59        | Somewhat not describes me                     | 4    |
| Verbal Aggression             | 2.62        | Neither describes nor not describes me        | 3    |
| <b>Overall Composite Mean</b> | <b>2.66</b> | <b>Neither describes nor not describes me</b> |      |

Parameters:  
 1.00-1.79 EN Extremely not describes me  
 1.80-2.59 SN Somewhat not describes me  
 2.60-3.39 N Neither describes nor not describes me  
 3.40-4.19 S Somewhat describes me  
 4.20-5.00 E Extremely describes me

Table 3 shows the respondent’s level of aggression by category. Anger was ranked as first with a weighted mean of 2.74 (Neither describes nor not describes me). Nobody likes to feel angry, but we all experience that kind of emotion from time to time. Given that many adults find it hard to express anger in ways that are healthy and productive, it is really unsurprising that angry feelings often bubble into outbursts for children. Very young children are particularly vulnerable because they do not have the experience to cope with their feelings and manage their stress. Some very young children repress their feelings, or they express their fear and anxiety in the only way they know how, which is usually by getting angry.

However, last in rank was physical aggression. This category has the lowest composite mean of 2.59 (Somewhat not describes me) of all and this is an agreement of the study of Elmasry, et al., (2016) that older than 15 years were significantly more physically aggressive than those younger than 15 years. They also found out that 51.7% of the students showed minimal degree of physical aggression, 39.1% of them showed mild degree of physical aggression, 8.5% showed moderate degree, and 0.7% showed severe degree of physical aggression. Based from the table above, the respondents are Grade VI pupils in the age bracket of 11-15 years old. In connection with this, they are less in the level of being physical aggressive. In elementary graders, teachers and parents can still control the aggression of learners in



terms of physical category unlike to those students who are already in secondary school or even in college that no one can control if this kind of aggressiveness is really there in itself.

The table presents the overall composite mean is 2.66 which is neither describes nor not describes me. Majority, for them the category with statements was negative that pushed the respondents not to accept the truth and will not choose to admit the option. Some could probably felt difficulty in describing itself.

**Table 4. Relationship between the Respondents' Profile and Their Level of Aggression**  
N = 170

| Level of Aggression and.. | X <sup>2</sup> | Df | p-value | Interpretation  | Decision            |
|---------------------------|----------------|----|---------|-----------------|---------------------|
| Profile                   |                |    |         |                 |                     |
| Age                       | 8.514          | 12 | 0.744   | Not Significant | Failed to Reject Ho |
| Sex                       | 6.426          | 3  | 0.093   | Not Significant | Failed to Reject Ho |

\*Correlation is significant at 0.05 level (2-tailed)

Table 4 displays the test of relationship between the pupils' level of aggression and their profile in terms of age and sex. The result revealed that there is no significant relationship between the pupils' level of aggression and their age profile since the computed chi-square value of 8.514 at 12 degrees of freedom with a p-value of 0.744 which is larger than 0.05 level of significance, thus failed to reject the null hypothesis. It can be denoted that the level of pupil's aggression doesn't stick to a certain age bracket.

Likewise, there is no sufficient evidence of a significant relationship between the pupils' profile as to sex and their level of aggression since the computed chi-square value of 6.426 at 3 degrees of freedom with a p-value of 0.093 which is larger than 0.05 preset level of significance, thus failed to reject the null hypothesis. This implies that the level of aggression of a certain child is not necessary to be revealed within a certain sex preference. Early exposure of media violence places both male and female. As long as that child exposed to any violence in media, expect some changes of their behavior.

**Table 5. Relationship between the Levels of Media Violence Exposure and the Pupils' Level of Aggression**  
N = 170

| Level of Media Violence Exposure and.. | R     | p-value | Interpretation | Decision  |
|--|-------|---------|----------------|-----------|
| Level of Aggression                    | 0.422 | <0.001  | Significant    | Reject Ho |

\*Correlation is significant at 0.05 level (2-tailed)

Table 5 shows the test of relationship between the level of media violence exposure and pupils' level of aggression. The result revealed that there is a sufficient evidence of a significant relationship between the level of media violence exposure and the pupils' level of aggression since the computed correlation value of 0.422 with a p-value of <0.001 which is lesser than 0.05 level of significance, thus the null hypothesis is rejected. Children were increasingly became heavy media consumers. It indicated that much of media directed at children contains violent content and at risk for the development of aggressiveness and violent behavior.

## CONCLUSION

Based on the findings of the study, the researcher came up with these conclusions:

Generally, pupils had less exposure on action movies, news, social networking sites, video streaming sites and mobile games except on morality issues and somehow influence the aggression of the respondents. It also prejudiced behavior in such a way that prompts respondents' anger, and hostility influenced by jealousy. Respondents' physical aggression is prompted due to the protection of their own rights while verbal aggression is provoked when people around them tend to disagree.

The age and sex of the respondents does not exert influence on the level of aggression. Furthermore, there is sufficient evidence that level of media violence exposure affects the aggressiveness of the individual.

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# ANTIOXIDANT PROPERTIES OF PROTEIN HYDROLYSATES, AND PROXIMATE COMPOSITION OF THREE COMMON BEAN VARIETIES (*Phaseolus vulgaris L.*) FROM BENGUET

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## ABSTRACT

Common beans are important traditional food crops in Benguet. However, there is limited information on the nutritional content and bioactivity of proteins particularly for the varieties: “Burik”, “Lipstican”, “Pikante”. The aim of this study is to investigate the proximate composition and antioxidant properties of protein hydrolysates of the common bean varieties. Evaluation of the proximate composition of the beans revealed the following values: moisture varied from 10.16% to 10.32%; ash ranged from 4.32% to 4.68%; crude protein from 18.69% to 23.77%; crude fat from 1.09 to 1.82%; total carbohydrate from 54.55 to 59.64%; total fiber ranged from 3.96% to 5.83%. Protein hydrolysates of *Phaseolus vulgaris L.* varieties (“Burik”, “Lipstican”, “Pikante”) seeds have exhibited antioxidant properties. DPPH activity assays showed the highest antioxidant property in digested crude proteins isolated from “Burik”. The bean varieties used in the study are highly nutritious and have potential antioxidant properties. Incorporation of these legumes into novel bean-based food products for improved nutritional composition and increased consumption, further studies on purification, identification, and in vivo tests are recommended.

*Keywords: antioxidant activity, proximate, protein hydrolysates, “Burik”, “Lipstican”, “Pikante”, Reactive oxygen species, Free radical, 1,1-diphenyl-2-picrylhydrazyl (DPPH)*

## INTRODUCTION

Legume seeds are rich in nutrients and are sources of compounds that have various biological and functional properties (Bouchenak and Lamri-Senhadji, 2013; Martín-Cabrejas, M. A. ,2019). Common beans are widely consumed legumes that are rich in high-quality proteins (Zargar et al., 2017). Studies revealed that peptides derived from enzymatic hydrolysis of various food proteins have demonstrated health promoting properties that could be influenced by hydrolysis conditions and specificity of enzymes (Evangelho *et al.*,2016). Among the reported health benefits from peptides generated from food are immunomodulatory, antimicrobial, antihypertensive, anticancer, antioxidant, and hypocholesterolemic properties (Cheng et al., 2017; Zaky, *et al.*, 2021), and has stimulated research interest.

Natural antioxidants are becoming increasingly popular as a means of ensuring long-term safety and avoiding the harmful health effects of synthetic antioxidants (Roy *et al.*, 2021). Antioxidants are compounds that even in low concentrations play an essential role in neutralizing reactive oxygen species (ROS) or free radicals, which cause disintegration of the cell membrane, damage membrane protein, and mutations in DNA in organisms (Dontha, S. ,2016), resulting in inefficient cell functioning, aging, and disease development (Munteanu and Apetrei., 2021). The presence of free radicals causes oxidative stress in biological cells. Antioxidants have been shown in vitro to scavenge harmful free radicals, implying that an antioxidant-rich diet can provide health benefits (Dontha ,2016). Peptides derived from hydrolyzed dietary proteins have antioxidant properties comparable to or higher than synthetic antioxidants such as BHT, making them suitable for food applications (de Castro *et al.* ,2015).

Common beans are one of the traditional crops in the Cordillera Administrative Region. Exploring the potential of these legumes as a source of antioxidant protein hydrolysates could contribute to the study of the efficiency of the food for the prevention or treatment of diseases, apart from ensuring functional or nutritional quality. Seed properties may be influenced by factors such as variety and origin (de Jesus Ariza-Ortega et al., 2014), implying the significance of further research on these crop varieties with limited biochemical and nutritional information. The result of the study could also encourage farmers to consider increasing production to ensure a sustainable supply to consumers, as it has been reported by Tad-awan and Sagalla, (2015) that production of common beans has declined in the Cordillera Administrative Region.

### **Statement of the problems/objectives**

The general objective of this study was to experimentally investigate the proximate composition and antioxidant properties of protein hydrolysates of the three (3) varieties of *Phaseolus vulgaris L* from Benguet: “Burik”, “Lipstican” and “Pikante”

Specifically, the objectives of this study were:

1. To determine the proximate components of the three varieties of common beans (*Phaseolus vulgaris L.*) obtained from Benguet;
2. To isolate and hydrolyze the crude proteins from the three varieties of common beans (*Phaseolus vulgaris L.*);
3. To determine the antioxidant activity of the digested proteins.

## **MATERIALS AND METHODS**

### **Materials/chemicals**

The common beans used in the study were collected in La Trinidad, Benguet, identified as *Phaseolus vulgaris L.* at the UPLB Museum of Natural History. The analytical grade chemicals used in the study were purchased from chemical distributors.

### **Proximate analysis of common beans seeds**

Determination of moisture, ash, crude fat, crude fiber, and crude protein were conducted in accordance with the analytical protocols established by the Association of Official Analytical Chemists (AOAC, 2016). The total carbohydrate concentration was determined by subtracting between 100 and the total sum percentages of moisture, protein, ash, fat, and fiber (Hailu Kassegn, 2018). All of the results were carried out in triplicates and were expressed as a percentage.

### **Preparation of sample**

The mature seeds of the common beans were dehulled, dried, ground into powder, and suspended in n-hexane with a sample: solvent ratio of 1:10 (w/v). The solvent was decanted after an hour of fat extraction in an ice bath with constant stirring, and the residue was air-dried overnight before being stored at 4°C until further analysis.

### **Isolation and digestion of protein**

#### ***Extraction of proteins.***

The major crude proteins of the sample common beans were isolated using Kortt (1986) methods with minor modifications at a sample-to-solvent ratio of 1g:10 mL. The mixture was prepared by adding 10.0 grams of defatted pulverized seed samples to 100 mL of 35 mM potassium phosphate buffer (pH 7.2) containing 0.4 M NaCl with constant stirring in an ice bath. After two hours, this was centrifuged at 18 514 x g for ten minutes at 4°C. The supernatant was collected and refrigerated at 4°C.

#### ***Ammonium sulfate precipitation and Dialysis.***

With minor modifications, fractionation and precipitation were carried out according to Duong-Ly and Gabelli (2014). Cooper's nomogram was used to determine the amount of ammonium sulphate to be

added. Ammonium sulphate was gradually added to the protein solution in different saturation increments. The mixtures were gently stirred in an ice bath and were centrifuged at 12 857 x g for 10 minutes at 4°C. The precipitates or pellets were collected for each saturation point and dissolved in a small amount of buffer.

The precipitates collected from fractionation at different saturation points were placed separately in 14 kDa cut-off dialysis tubing to remove residual salt. The salt solutions were dialyzed against distilled water for 18 hours at 4°C with constant stirring. The dialysates were centrifuged for 10 minutes at 4°C at 12 857 x g.

#### ***Digestion of Protein Isolate***

The crude protein isolates from the samples were digested with pepsin and were incubated for 2 hours in a water bath at 37 °C. The digestion process was stopped by immersing the mixture in a boiling water bath for 5 minutes and then immediately placing it in a freezer. Prior to analysis, the samples were centrifuged at 12 857 x g for two minutes at 4°C. The supernatant was collected and used in the analysis.

#### **Determination of protein content**

The Bradford microplate assay was used to determine the soluble protein content of matured seeds from the selected samples.

The binding of coomassie brilliant blue G-250 to protein causes a shift in the absorbance of solution from 465 to 595 nm, which is the basis for this assay, and the protein quantity can be estimated by measuring the solution absorbance at 595 nm (Nouroozi,*et al.* ,2015).A series of protein standard concentrations was prepared using Bovine Serum Albumin (BSA) as the positive control. A total of 250 mL of Bradford reagent was added to 5.0 µL of standard solution and samples were thoroughly mixed in a microtiter plate. The plate with the sample was covered in aluminum foil and left in the dark for 5 minutes. The absorbance of each mixture was measured at 595 nm using a UV-Vis spectrophotometer. A standard curve was created to calculate the protein concentration in milligrams per milliliter.

#### **DPPH free radical scavenging activity.**

The 2,2-diphenyl-1-picrylhydrazyl (DPPH) free radical-scavenging activities of the common beans seed samples were determined by adopting the method of Do, *et al.*, (2014) with minor modifications. This assay is based on the reduction of DPPH, a free radical with a maximum absorption wavelength of 517 nm that, when reacted with antioxidants, causes a decrease in absorbance and decolorization from purple to pale yellow (Dontha, 2016). The reactions in this method are not completely affected by its side reaction, and its mechanism of action complements antioxidant studies of legumes (Khatun and Kim, 2021). Briefly, the following solutions were prepared: a 0.1mg/mL DPPH solution in methanol, ascorbic acid (positive control) solution in methanol, and test sample solutions in methanol. In a microtiter plate, 0.150 mL of samples and positive control were placed and mixed with .050 mL DPPH solution. The positive control used was ascorbic acid. The mixtures were incubated in the dark for 30 minutes and the absorbance was read at 517 nm using UV-Vis spectrophotometer. A higher DPPH radical scavenging activity corresponds to a lower absorbance (Petchiammal,and Hopper ,2014).

The percentage of DPPH scavenging was estimated using the equation

$$\% \text{ scavenging of DPPH} = ((A_0 - A_1)/A_0) \times 100$$

Where: A<sub>0</sub> = absorbance of the control and  
A<sub>1</sub>= absorbance of the sample extracts.

## **RESULTS AND DISCUSSION**

#### **Proximate analysis of common beans**

Proximate analysis revealed that the seeds of *P. vulgaris* varieties “Burik,” “Liptican”, and “Pikante” had a high nutritional value (Table 1). The common beans used in subsequent studies contain significant amounts of protein.

**Table 1. Proximate Composition of Mature Seeds of *Phaseolus vulgaris* L. Varieties, “Burik”, “Lipstican” and “Pikante”**

| PARAMETER<br>(%w/w) | “Burik”            |      | “Lipstican”        |      | “Pikante”          |      |
|---------------------|--------------------|------|--------------------|------|--------------------|------|
|                     | M                  | SD   | M                  | SD   | M                  | SD   |
| Moisture            | 10.16 <sup>a</sup> | 0.28 | 10.23 <sup>a</sup> | 0.40 | 10.32 <sup>a</sup> | 0.13 |
| Ash                 | 4.68 <sup>a</sup>  | 0.03 | 4.23 <sup>b</sup>  | 0.06 | 4.57 <sup>a</sup>  | 0.09 |
| Crude protein       | 23.77 <sup>a</sup> | 0.28 | 20.25 <sup>b</sup> | 0.28 | 18.69 <sup>c</sup> | 0.18 |
| Crude fat           | 1.02 <sup>b</sup>  | 0.12 | 1.69 <sup>a</sup>  | 0.25 | 1.82 <sup>a</sup>  | 0.18 |
| Total Carbohydrate  | 54.55 <sup>b</sup> | 0.51 | 59.64 <sup>a</sup> | 0.20 | 59.61 <sup>a</sup> | 0.52 |
| Crude fiber         | 5.83 <sup>a</sup>  | 0.15 | 3.96 <sup>c</sup>  | 0.12 | 4.99 <sup>b</sup>  | 0.13 |

Note: Different letter superscripts within the same row are significantly different at  $p < 0.05$  based on Tukey's test.

Among the three varieties of common beans, “Burik” had the highest amount of crude protein and crude fiber. The values of ash, crude fat and crude protein were close with the amounts reported by Gouveia *et al.* (2014) on total protein (18.55-29.69g), ash content (3.64-5.67g) and lipid (0.57-2.86g) dry matter basis, on the nutritional variability of 52 common bean varieties.

The moisture contents of all varieties were not significantly different from each other, and the values were comparable to those obtained by Shimelis and Rakshit (2004) for dry seeds of beans grown in Ethiopia, which ranged from 9.08% to 11.90%. One of the most important parameters evaluated in food processing, preservation, and storage, is moisture (Onwuka, 2005). Low moisture content is associated with a longer shelf life (David *et al.*, 2014). The moisture content of seeds is determined by the interaction of relative humidity and temperature of the environment (Nahar *et al.*, 2009). Meanwhile, higher moisture in seeds promotes deterioration. Moisture from the ambient air is absorbed by highly hygroscopic seeds stored at a relative humidity lower than the surrounding environment (Nahar *et al.*, 2009).

The highest ash content was found in “Burik” and “Pikante”, which was only marginally different from “Lipstican”. These values, however, were lower than those obtained from kidney bean seeds and small red beans (Ibeabuchi *et al.*, 2017). As inorganic compounds are present in the samples for analysis, ash content indicates the presence of minerals in the seeds (Onwuka, 2005) and may imply adulteration or contamination of food products (Ibeabuchi *et al.*, 2017). A high concentration of transition metals in fat-rich foods can cause rancidity and shorten shelf life (Harris and Marshall, 2017). Variation of ash content could be due to environmental factors or the age of the plant samples under investigation (Datta *et al.*, 2019).

“Burik” had significantly lower crude fat content than “Lipstican” and “Pikante”. Crude fat is a source of energy and aids in the transport and absorption of fat-soluble vitamins (David *et al.*, 2014). Fat content in food influences the overall sensory such as flavor, texture, mouthfeel, and appearance. The values were comparable to that of modern varieties of common beans (0.33% to 1.33%) as reported by Celmeli *et al.* (2018), and of kidney bean seeds (1.55-2.83%) obtained by Kan *et al.*, (2016). However, these were significantly lower than the estimated 17% (Al and Oladimeji, 2008) and 19.9% (Elleferson, 2017) crude fat content of soybean.

The crude fiber content was highest in “Burik”. In a report by Los *et al.* (2018) common beans contain 1.70 to 3.90 % crude fiber which was lower than the values obtained in the present study. Crude fiber is a measure of the level of lignin and indigestible carbohydrate, which enhances the absorption of glucose and fat, and increases bowel movement (David *et al.*, 2014). A high concentration of crude fiber, on the other hand, may trigger intestinal irritation, decreased digestibility, and reduced nutrient utilization (David *et al.*, 2014). Dietary fibers are associated to physicochemical properties of food products, such as their consistency, texture, rheological behavior, and sensory characteristics (Kan *et al.*, 2017).

The protein content of the three varieties of *P. vulgaris* studied showed excellent protein content, close to the values obtained with various Brazilian dry beans, ranging from 19% to 23% (Rezende *et al.*, 2018), and raw Ganxet beans calculated as 22.7% in the study of Aguiló-Aguayo *et al.* (2021). The obtained results were also similar to the report of Celmeli *et al.* (2018) on the protein content of common bean landraces (16.54% - 25.23%) and modern varieties (19.70% - 24.30%).

The protein content of beans was similar to that of meat, ranging from 20% to 30%. (Hayat *et al.*, 2015). Proteins have nutritional and functional properties in addition to their role in the physicochemical

and sensory properties of food. Due to high protein content, common beans may also be a source of enzymatic protein hydrolysates with bi-functional bioactivities. Their bioactive peptide components are correlated to their biological functions (Rizzello *et al.*, 2016). However, differences in the environment due to location interactions can affect the amount of protein in the seeds (Celmeli *et al.*, 2018).

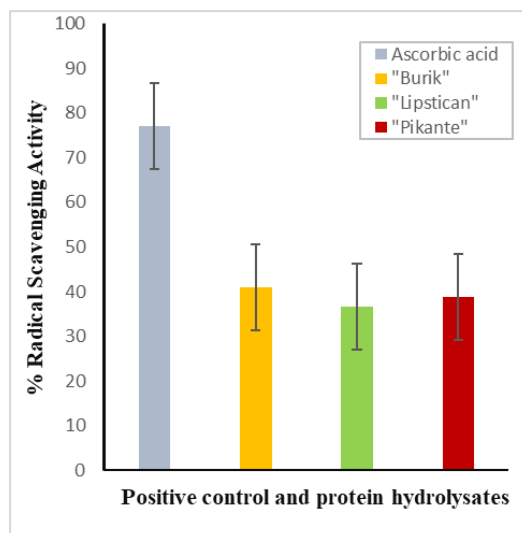
Several factors have a significant impact on the physicochemical properties and sensory attributes of legumes. These could be due to genotypic variation, the type of soil in which the beans were grown, location, plant nutrient absorption ability, and other environmental conditions (Alemu, 2018; Mkanda *et al.*, 2007; Rezende *et al.*, 2018; Rot *et al.*, 2021; ).

### Antioxidant property

The protein hydrolysates of common bean varieties used in this study had significantly different radical scavenging activities when compared to each other and with the positive control, Ascorbic acid (Figure 1). Among the samples, it was observed that “Burik” (41.03%) had the highest activity, followed by “Pikante” (38.73%) and then, “Lipstican”(36.64%). These values were lower compared to the antioxidant activities of pancreatin hydrolysates from protein of germinated pigeon pea, lablab bean, and common bean (68.97 %, 84.02 %, and 67.89 %, respectively) in the study of Ratnayani *et al.* (2017) but comparable to the values of *Phaseolus vulgaris* with % radical activity of 35.0% -39.1 % reported by Petchiammal and Hopper.,(2014) .

Other protein hydrolysates obtained from other legumes such as chickpea ( 1 mg/mL), and from mung bean (2.6 mg/mL) had higher DPPH radical scavenging activity of 57% and 74.23%, respectively (Aguiló-Aguayo,*et al.*, 2021). Evangelho *et al.* (2016) studied black beans (*Phaseolus vulgaris*) protein hydrolysates obtained through pepsin digestion and reported that the protein hydrolysate had 45.15% antioxidant activity by DPPH.

**Figure 1. DPPH Radical Scavenging Activity of Protein Hydrolysates from *Phaseolus vulgaris* L. Varieties, “Burik”, “Lipstican” and “Pikante”.**



In comparison with other legumes such as black horse gram(56.5%), and brown cowpea (54.4 %), as reported by (Petchiammal and Hopper.,2014), the lower free radical scavenging ability of the common bean in this study may be attributed with their lower protein contents. Antioxidant properties of peptides are associated with their composition, structure , hydrophobicity, and sequence (de Castro and Sato. ,2015). Aromatic amino acids (tryptophan, tyrosine, phenylalanine) in bioactive peptides, as well as amino acids with indole and imidazole functional groups, have exhibited antioxidant activity (Ratnayani *et al.*,2017). The presence of Histidine has been reported to exhibit radical scavenging by chelation, lipid trapping and decomposition of the imidazole ring, whereas Tyr, Trp, Met, Lys and Cys have the ability to reduce  $Fe^{3+}$  to  $Fe^{2+}$  and to chelate  $Fe^{2+}$  and  $Cu^{2+}$  ions (de Castro and Sato, 2015). Peptides and amino acid residues are released from intact protein during hydrolysis, and certain pep-

tides and amino acids are involved in electron/hydrogen disposal, and are capable of reacting with free radicals, resulting in an increase in the antioxidant activities of protein hydrolysates. This was observed in hyacinth bean protein hydrolysates at 38.97% to 94.56% from increasing concentration (Roy et al., 2021). According to Aguiló-Aguayo et al. (2021), enzymatic hydrolysates from legumes with a molecular weight less than 1 kDa had a high concentration of antioxidant peptides. Other contributory factors to inconsistent results in various studies are cultivars, geography, extract solvent, sample parts, and antioxidant assays (Kan et al., 2017).

## CONCLUSION

The common bean varieties (“Burik”, “Lipstican” and “Pikante” ) have a high nutritional quality that is comparable to other varieties of common beans and other legumes as reported in various studies. The protein hydrolysates obtained through pepsin digestion of isolated proteins from these crops showed potential antioxidant properties, implying that consumption of these common beans should be encouraged for disease prevention and treatment.

## RECOMMENDATION

It is recommended that the common beans be incorporated into novel bean-based food products for improved nutritional composition and increased consumption. Other health potential bioactivities of these crops may be also explored. Protein purification, identification of bioactive peptides, and in vivo tests to further assess the efficacy of antioxidant properties are also recommended.

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APPENDIX



MUSEUM OF NATURAL HISTORY

University of the Philippines Los Baños  
College, Laguna 4031 Philippines



CELEBRATE WITH THE WORLD 2011-2020 – THE DECADE OF BIODIVERSITY

UPLB MNH Form No. 4

REPORT OF IDENTIFICATION

SUBMITTED BY: Yvonne Bolayo DATE: 19 September 2019

RECEIVED BY: Michelle DR. Alejado-San Pascual DATE: 19 September 2019

DESCRIPTION/ACCOMPANYING DATA: Complete parts (fresh specimens)

RESULTS/DIAGNOSES:

Family name: Fabaceae  
Scientific name: *Phaseolus vulgaris* L.  
Common name: common bean

PREPARED BY:

*San*  
MICHELLE DR. ALEJADO-SAN PASCUAL  
University Researcher I  
Botanical Herbarium

IDENTIFICATION MADE BY:

*annasall*  
ANNALEE S. HADSALL  
Curator, Botanical Herbarium

Date: 20 September 2019

NOTED:

*JG*  
JUAN CARLOS T. GONZALEZ  
Curator, Zoological and Wildlife  
Museum &  
Director, MNH

Date: 23 September 2019



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