



THESES and DISSERTATIONS

(Abstract)



ABSTRACT

ABAD, HAZEL V. Mariano Marcos State University. May 2021. **PUBLIC ELEMENTARY SCHOOL TEACHERS' ATTITUDE AND COMPETENCE IN USING E-ASSESSMENT TOOLS.**

Major Adviser: Rosabel L. Acosta, Ed.D.

This descriptive-correlational study aimed to describe the teachers' attitude and competence in using e-assessment tools. It sought to determine the teachers' socio-demographic characteristics in terms of age, number of years in teaching, number of years in teaching with ICT integration and number of trainings on using e-assessment tools. Further, it ascertained the relationships between and among the following variables: teachers' attitude in using e-assessment tools, teachers' perceived level of competence in using e-assessment tools and their socio-demographic characteristics. Moreover, the challenges faced by the teachers in using e-assessment tools were described.

The study used total enumeration however, only 119 teachers (87.5%) emerged as participants out of 136 public elementary school teachers from Sarrat District, Schools Division of Ilocos Norte during the School Year 2020-2021. Data gathering was done online through the validated researcher-made questionnaire and was also supplemented by a virtual informal interview with some teachers. The gathered data were analyzed using frequency and percentage distribution, weighted mean, Pearson's Product Moment Correlation, and point-biserial correlation. Results revealed that the public elementary school teachers in Sarrat District comprised of teachers who have a well-distributed age range, length of service and years of teaching with ICT integration; only few have attended trainings related to the use of e-assessment tools.

In using e-assessment tools, the teachers' over-all attitude is very highly favorable and their level of competence is Basic, likewise they face challenges. Teachers' attitude in using e-assessment tools is significantly negatively correlated to age and number of years in teaching. There is no significant relationship to the number of years in teaching with ICT integration and number of trainings on using e-assessment tools.

A significant negative correlation exists between the level of competence of teachers in using e-assessment tools and age, number of years in teaching and number of trainings on using e-assessment tools. The level of competence of teachers in using e-

assessment tools and the number of years in teaching with ICT integration shows no significant relationship.

The teachers' attitude and level of competence in using e-assessment tools indicates slight relationship. However, there is no significant relationship between the teachers' attitude and level of competence. This implies that the level of competence of teachers in using e-assessment tools is not significantly affected by their attitude.

ABSTRACT

ACERET, DAN MANAYON T. Mariano Marcos State University. May 2020. **LIFE SCIENCE TEACHERS' SCIENTIFIC LITERACY SKILLS: BASES FOR THE DEVELOPMENT OF LEARNING ACTION CELL (LAC) PLAN.**

This descriptive research aimed to determine the Life Science teachers scientific literacy skills and its implications of their professional development. of a Learning Action Cell (LAC) plan to hone the scientific literacy skills of the teachers in Life Sciences subjects.

Data were gathered using adopted Test of Scientific Literacy Skills (TOSLS) of Gormally, Brickman, & Lutz (2012) and a conduct of Focus Group Interview (FGI). The respondents were 33 public Senior High School (SHS) Life Science teachers teaching who are currently handling General Biology 1 and 2 of the Schools Division of Ilocos Norte. The said subjects are being offered as specialization in the Science, Technology, Engineering, and Mathematics (STEM) strand in the Academic Track.

Finding revealed that most teachers of life sciences have moderate mastery level scientific literacy skills. Scientific literacy skills in identifying a valid scientific argument, evaluating the use and misuse of scientific information, understanding elements of research design and how they impact scientific findings/conclusions, making graph and solving problems using quantitative skills, including probability and statistics of the Life Science teachers fell under category of moderate mastery level skills while scientific literacy skills on conducting an effective literature test, reading and interpreting graphical representations of data, and understanding and interpreting basic statistics fell under low mastery level skills.

The identified implications of the Life Science Teachers scientific literacy skills that are geared towards their professional development served as bases for the development of a LAC Plan to further hone the scientific literacy skills of the Life Science teachers.

ABSTRACT

ACIDO, LOVELYN G. Mariano Marcos State University. May 2020.
MICROLEARNING-BASED LESSONS IN CHEMISTRY.
Major Adviser: Aris Reynold V. Cajigal, Ph.D.

This study aimed to develop Microlearning-based Lessons in Chemistry to improve the performance of Grade 9 students along the topics in chemical bonding, variety of carbon compounds and mole concept. Using descriptive research design and Research and Development methodology, this study involved four groups of participants namely, three Chemistry experts from one state university in Ilocos Norte, 20 Science teachers from the Department of Education, Schools Division of Ilocos Norte, City of Batac, and Laoag, 10 Information Technology (IT) experts, and 50 Grade 9 students from the Division of Laoag City. The student participants were grouped into two, the control and the experimental groups. The research instruments used were Evaluation Checklist for Chemistry experts/Science teachers, Evaluation Checklist for IT experts, and a researcher-made Performance Test. The validity and reliability of the Performance Test was determined prior to its use.

Data on the evaluation of the content and technical standards of the Microlearning-based Lessons in Chemistry were analyzed using mean Results of the study reveal that the content standards of the Microlearning-based Lessons in Chemistry are highly satisfactory in terms of objectives, content, instructional characteristics and assessment tools. In addition, the findings of the study show that the technical standards of the developed lessons are highly satisfactory in terms of functionality, reliability, usability, efficiency and portability

The findings further reveal that the students' performance improved after being exposed to Microlearning-based Lessons in Chemistry. Using t-test, it was found that there is a significant difference between the pretest and posttest mean scores of the control and experimental groups. Furthermore, it was found that there is a significant difference between the posttest mean scores of the control and experimental groups. This implies that students perform better when they use Microlearning-based Lessons in Chemistry. This further shows the effectiveness of the developed material in improving the performance of Grade 9 students in chemistry. It is then recommended that the microlearning-based lessons be adopted in the chemistry classroom for Grade 9.

ABSTRACT

ADRIATICO, JOHN LORENZ O. Mariano Marcos State University. December 2019.
EFFECTIVE STRATEGIES IN TEACHING WRITING AS PERCEIVED BY WINNING COACHES.

Major Adviser. Dr. Ronald Candy S. Lasaten

This quantitative-qualitative research determined the strategies perceived effective by the winning coaches of public elementary school teachers in teaching writing along the planning stage, translating stage and reviewing stage. Further, it determined the implications of these strategies to teaching writing in the elementary level.

Using a purposive sampling technique, eight elementary teachers writing from the three school divisions in Ilocos Norte, who also serve as coaches and school paper advisers in campus journalism and won or reached National Schools Press Conference (NSPC) at least twice over the past three years, were chosen for the study.

Research instruments used include the researcher-made survey checklist anchored on the Writing Processes element of Flower and Haye's (2009) Cognitive Process Theory of writing to identify the effective strategies employed by the elementary teachers in the different stages of writing and an interview guide to validated the data gathered from the survey.

Data gathered from the survey were interpreted and analyzed using frequency count, and percentage. Data from the interview conducted were coded and thematically analyzed.

Findings reveal that along planning stage, the teachers deem the following strategies effective: a) creative writing situation/knowing the purpose/type of writing or audience; b) stimulating/generating ideas(schema activation, brainstorming, notetaking) c) organizing/outlining (forming ideas, grouping categories, ordering of texts) d) studying models; e) choosing a suitable titles; f) oral discussions ; g)observing; h) researching; i)experiencing; and j)watching films or other media.

Along the translating stage, finding reveal that the teachers considers the following strategies effective: a) recalling criteria/conventions for the evaluation of the written output; b) listing/writing or words and expressions for ready reference; c)rewriting/revising the draft's ;d0 writing the final draft; and e) sentence generation – practicing writing good topics sentences.

Along the reviewing stage, the teachers reveal that the following strategies are effective: a) proofreading; b) presenting/analyzing the most persistent errors in the composition's) revising; d) giving feedback/comments/suggestions/recommendations; and e) presenting the written output in class.

Findings further reveal implications of the said effective strategies in teaching writing in the elementary level. The strategies suggest that teachers need to: a) set goals, objectives and purposes of writing to pupils before the actual writing takes place; b) explain to pupils how their written outputs will be evaluated ;b) enrich and prepare pupil's background of a certain topic to

write about before writing; c) prepare and select appropriate activities to engage pupils in the writing process; d) involve pupils in evaluating or assessing their written outputs.

ABSTRACT

AGUINALDO, MA. CRISTINA BUMANGLAG. Mariano Marcos State University.
May 2020. **LEVEL OF KNOWLEDGE, ATTITUDES, BELIEFS AND UTILIZATION OF
WHOLE BRAIN LITERACY SYSTEM AMONG GRADE 4 TEACHERS.**

Major adviser: Elena Edna C. Nagtalon,Ed.D.

Using the descriptive-correlational research design, the study describes the level of knowledge, attitudes, beliefs, and utilization of Whole Brain Literacy System among Grade 4 Teachers in Public elementary schools of Bacarra Districts I and II of the Division of Ilocos Norte. It is also determined the relationship between the socio – demographic profile of teachers teaching English 4 and their level of knowledge, attitudes and beliefs on WBLS. Utilization of the WBLS among teachers teaching English grade four was also identified.

Twenty-three (23) teachers teaching English grade four public elementary schools in Bacarra Districts I and II in the Schools Divisions of Ilocos Norte were involved in the study. Their level of knowledge, attitudes, beliefs and utilization were determined using a validated researcher-made survey questionnaire.

Data were analyzed using frequency counts and percentages, mean, standard deviation, Pearson r and point – biserial correlation. In all test of significance, the level of significance was set at .01 and .05 probability level.

Findings revealed that the teachers are at their middle-aged stage, are dominated by females and majority of them are married, predominantly BEEed graduates and have earned some masters' units and have attended only one seminar/ training related to WBLS. Further, findings revealed that the teachers' level knowledge on WBLS is highly adequate, their level of attitudes towards WBLS is highly favorable and in terms of beliefs, the teachers strongly believe WBLS. Teachers utilize the WBLS to a great extent. Furthermore, the teacher's level of utilization of WBLS is significantly related to their level of knowledge, attitude and beliefs on WBLS.

ABSTRACT

ALCOVER, MARY JERZEN. July 2020. Mariano Marcos State University. **THE EFFECTS OF JOURNAL WRITING ON STUDENTS'S PERFORMANCE AND ATTITUDE TOWARDS MATHEMATICS.**

Adviser: Rosabel L. Acosta, Ed.D.

Using the quasi-experimental research design, this study determined the effects of journal writing on students' performance and attitude towards Mathematics. It compared the students' performances and attitudes towards mathematics in the experimental and control groups before and after the implementations of the journal writing.

The study involved two sections of grade 11- Science Technology, Engineering, and Mathematics (STEM) track students of Northwestern University, Laboratory High School, Laoag City. The tow sections namely, Grade 11 Hope and Grade 11- Fortitude with thirty-eight (38) students respectively, were involved in the study, for a total population of seventy-six (76) students. The study as conducted during the third quarter of the second semester of School Year 2019-2020. The lessons included simple and compound interests, simple annuity, and general annuity and deferred annuities. Lessons were conducted for 3 weeks ,4 sessions a week with 1 hour per session.

The findings of the study revealed that before the experimental and control group were exposes to their respective treatments, there was no significant difference in the students' performances and attitudes towards Mathematics as shown by their pretest results of their attitudes.

ABSTRACT

ANDRADE, MARY JOYCE V. Mariano Marcos State University. May 2021.
COMPETENCY AND PROFESSIONAL DEVELOPMENT NEEDS OF SENIOR HIGH SCHOOL PHYSICS TEACHERS.

Major Adviser: Vida V. Antonio, EdD.

This descriptive-correlational research aimed to determine and describe the Senior High School Physics teachers' socio-demographic characteristics, level of competency, professional development needs, and the relationships between and among these variables. Via total enumeration included 60 Physics teachers from public Senior High Schools in the Schools Divisions of Ilocos Norte, Laoag City, and the City of Batac. An adapted questionnaire from the Framework for Philippine Science Teacher Education of the DOST-SEI and UP-NISMED, which was modified with the aid of experts to suit the need of the study, was the main tool to gather data. Frequency, percentage, mean, and standard deviations were used to analyze the data collected on the teachers' socio-demographic characteristics, level of competency, and level of professional development needs. Pearson's (r) moment of correlation was used to determine the relationship between the teachers' socio-demographic profile, their level of competency, and perceived professional development needs.

The Independent sample t-test and one-way Analysis of Variance (ANOVA) were used to determine if there is a significant difference in the teachers' level of competency and level of professional development needs when grouped according to their socio-demographic characteristics. Findings revealed that the teachers have a High level of competency along professional knowledge, professional practice, and professional attributes. The teachers' teaching position has a significant relationship with their level of competency along professional practice and professional attributes. Their major or field of specialization is significantly related to the level of their professional knowledge. It was also found out that teachers have a High Need for professional development for content, pedagogy, and assessment. Specifically, they need professional interventions on Thermodynamics, Electricity and Magnetism, Modern Physics, ICT-Based Physics, Authentic Assessment, and online or c-assessment. It was found that age has a significant relationship to their level of professional development needs along pedagogy.

In the light of the findings, it is recommended that there be a competency-based program in Physics for the retooling and upskilling of teachers focusing on Physics content, pedagogy, and assessment.

ABSTRACT

AURELIO, ROLANDO, JR. Mariano Marcos State University. May 2021.
PARENTAL INVOLVEMENT IN CHILDREN'S LEARNING OF LIFE SCIENCES IN THE NEW NORMAL

Major Adviser: Aleli R. Martin, MAEd

This descriptive study determined the involvement of parents in their children's learning of life sciences in the new normal. Ninety (90) parents from Florentino Camaquin Integrated School were chosen as respondents in the study. The parents' profile, level of awareness to science curriculum as well as their level of involvement in their children's learning of Life Sciences were determined using the Parental Involvement Checklist. An interview with twenty (20) parents was conducted to collect data regarding their concerns in their involvement in their children's learning of Life Sciences in the new normal. Meanwhile, the validity of the checklist and interview questionnaire was assessed by three (3) identified experts in the field of science education.

Frequency and percentage were used to analyze the data collected concerning the profile of the parents. Information concerning the parents' level of awareness to science curriculum and their level of involvement in their children's learning of life sciences were analyzed through the use of mean. Furthermore, Pearson r correlation was used to analyze whether there is a significant relationship between the parents' profile and their (a) level of awareness to science curriculum, and (b) level of involvement in their children's learning of the Life Sciences.

Findings revealed that the parents are moderately aware of the science curriculum. It is also revealed that parents are often involved in their children's learning of Life Sciences. Moreover, the parents' profile is significantly related to their level of awareness to science curriculum and their level of involvement in their children's learning of Life Sciences. Meanwhile, obtained results and analyses of the interview indicated that parents still have concerns regarding their involvement in their children's learning of Life Sciences in the new normal.

ABSTRACT

AVILA, AL CAREMON G. Mariano Marcos State University. May 2020. **EXPLORING STUDENTS' CREATIVE CONFIDENCE AND CREATIVE COMPETENCE IN DISTASTER READINESS AND RISK REDUCTION USING DESIGN THINKING-BASED LESSONS.**

Adviser: Aleli R. Martin, MAEd

Employing the descriptive research design incorporating the preliminary, prototype and assessment stage of Design-Based Research (DBR) Methodology, the study specifically explored how the lessons on Life Science topics in DRRR were designed especially the identification of Life Science topics.

Data were collected from the checklist answered by fifteen (15) teachers, validation tool used by three (3) experts and survey questionnaires responded by twenty-eight (28) Grade 12 students. Transcriptions and remarks from the semi-structured interview and observation were also analyzed. Frequency count, rank and mean were used to analyze the findings.

The results of the survey showed that teachers perceived potential earthquake hazards affecting biological components as the most difficult Life Science topic to teach where this was considered in designing six DTBLs in DRRR. The finding proved the theories in Design Thinking that DTBLs influenced students' efficiency to creatively and innovatively accomplish the tasks given to them and developed a sense of 'trust' in framing substantial problems in coming up with potential solutions relevant to the needs of the society. Hence the use of DT in writing DTBLs and utilizing DBR Methodology were recommended for classroom teaching.

ABSTRACT

BACLAGAN, DONA D. Mariano Marcos State University. May 2021.
**COMPETENCY-BASED STRATEGIC INTERVENTION MATERIALS FOR
GRADE 10 COOKERY.**

Major Adviser: Ruben J. Dabalos, MTE

The study aimed to develop competency-based strategic intervention materials in Cookery 10 based on students' least mastered core competencies as perceived by Cookery 10 teachers and TESDA assessors. Specifically, it looked into the least mastered competencies of the students and use these data as bases in the development of strategic intervention materials (SIMs).

This study was conducted at the public secondary schools in the Schools Division of Ilocos Norte. It involved the 24 Cookery 10 teachers and four TESDA assessors, who specialize in Cookery. A survey questionnaire based on the K to 12 Cookery 10 Curriculum was used together data on the students' least mastered competencies. Further, a validation instrument was used to establish the validity of the SIMs developed. The SIMs were validated along objectives, contents, activities, assessment techniques by a pool of experts.

Findings revealed that preparing meat dishes and cooking seafood dishes are the perceived least mastered competencies of the students in Cookery 10. Also, results revealed that there is no difference on the assessment of the teachers and TESDA assessors on the least mastered competencies of the students. Finally, the study revealed that the Competency-based Strategic Intervention Materials (SIMs) developed based on the students' least mastered competencies were valid in terms of objectives, contents, activities and assessment techniques.

ABSTRACT

BANCUD, ALVIN JAY, PABO. Mariano Marcos State University. May 2021
BEST PRACTICES OF AWARD-WINNING SCHOOLS IN THE IMPLEMENTATION OF THE BRIGADA ESKWELA PROGRAM IN ILOCOS NORTE.

Major Adviser: Elena Edna C. Nagtalon, Ed.D.

This descriptive research determined the best practices of award-winning schools in the implementation of the Brigada Eskwela Program (BEP) in Ilocos Norte. Further, it determined the level of implementation of BEP, the challenges encountered by the school personnel and stakeholders and how they were able to overcome these challenges. The study involved five school heads, 30 teachers and 30 PTA officers of the six schools in Ilocos Norte that were recognized in national and regional levels as best implementing schools of BEP for at least three times over the past five years (2015-2019).

A researcher-made survey questionnaire on the implementation of BEP formulated based on the Brigada Eskwela Manual for School Heads (2009) was used to gather data on the level of implementation of the said program. Informal interviews were conducted to collect data on best practices of award-winning schools, the challenges encountered and how they were able to overcome these challenges. Also, document analysis was utilized to support the data from the survey and interview.

Data gathered from the survey questionnaire were tabulated, organized and interpreted using means. Meanwhile, data gathered from the interview were coded and thematically analyzed.

Findings revealed that the award-winning schools in the implementation of BEP in Ilocos Norte have very high implementation during the pre-implementation phase, implementation phase and post-implementation phase. Findings further revealed that school heads, teachers and PTA officers perceived that the activities in the pre-implementation phase, implementation phase and post-implementation phase are very highly implemented.

It was also revealed that there were best practices of the award-winning schools in the implementation of BEP. These include good leadership, benchmarking, early preparations, outsourcing of funds, special programs, showing appreciation to stakeholders, transparency and sustainability of the program. Lastly, results revealed that during the implementation of the BEP, there were challenges and problems encountered by the schools. These include lack of funds, overlapping of activities, irregular attendance and difficulty in accomplishing reports but

due to coping strategies of schools, they were able to overcome these challenges and problems.

ABSTRACT

REINAMAE G. BANQUIRIG. Mariano Marcos State University, December 2020. **PERFORMANCE OF OFF-SEASON GREEN GARLIC (*Allium sativum* L.) GROWN UNDER SAN MANUEL SOIL TYPES AS AFFECTED BY PLANT GROWTH PROMOTERS.**

Major Adviser: Dr. Artemio B. Alcoy.

The experiment was conducted in Barangay Mangato B, City of Laoag, Ilocos Norte and Barangay San Roque, Paoay, Ilocos Norte during dry season 2020 which aimed to evaluate the performance of registered garlic varieties and cultivar as affected by different plant growth promoters under San Manuel soil types for green garlic production in terms of growth and yield performance.

The study was conducted to determine the growth and yield performance of different garlic varieties and cultivar as green garlic under San Manuel soil types, to find out the best plant growth promoter (PGP) that will enhance the green garlic production under San Manuel soil types, to know the interaction between the green garlic varieties and cultivar and plant growth promoters under San Manuel soil types, to identify between San Manuel Clay-loam and San Manuel Sandy-loam soil type is more suitable in green garlic production, to determine the phytochemical effects of plant growth promoters to green garlic varieties and to ascertain the cost and return analysis of the green garlic varieties and cultivar applied with different plant growth promoters under San Manuel soil types. San Manuel Soil types (Clay-loam and Sandy-loam), three plant growth promoters (Carageenan PGP, Ako'y Magsasakang Organiko Plant Growth Enhancer, and Winwinzone Black Gold Soil Conditioner and a control (no application), and four varieties (Ilocos White, Mexican, Miracle, and Ilocos Pink) and cultivar (Batanes White) served as the treatments and were laid out in a Split-split plot design with three replications and a unit plot size of 5 m. Results of the study revealed that San Manuel clay loam soil produces the tallest green garlic, has longer laminar length, wider laminar width, more number leaves however, San Manuel Sandy Loam produces larger bulb size and heaviest weight per plant that leads to having the highest yield at 1296.47kg/ha!

Sufficient evidence also revealed that the use of Ako ay Magsasakang Organiko and Carrageenan Plant Growth Promoter (CPGP) enhances the growth and increases the yield of green garlic plants. Furthermore, the use of Ilocos Pink variety and Batanes White cultivar performed better than the check variety Ilocos White in terms of agronomic and yield performance.

The combination of Batanes White applied with WBG obtained the highest ROI of 97.01% in San Manuel Clay Loam, while Ilocos Pink applied with AMO obtained the highest ROI of 237.37% in San Manuel Sandy Loam.

ABSTRACT

REMIGIO, HAMILTON C., Marinao Marcos State Univeristy. May 2019. **LEARNING STYLES AND SCIENTIFIC INQUIRY SKILLS OF JUNIOR HIGH SCHOOL STUDENTS.**

Major Adviser: Dr. Natividad E. Lorenzo.

This study was conducted to determine the relationship between the learning styles and scientific inquiry skills of Grade 10 junior high school in the different curricular programs of Ilocos Norte National High School, Laoag City during the school year 2018 – 2019.

The descriptive correlational research design was employed using two questionnaires: Learning Style Survey by Andrew D. Cohen, Rebecca L. Oxford and Julie C. Chi; and modifies questionnaire titled The Views About Scientific Inquiry (VASI) by Judith S. Lederman and others. A total of 430 students out of 762 Grade 10 students enrolled in the four curricular programs, namely Special Science Class (SSC), Special Program in the Arts (SPA), Special Program in Sports (SPS) and Regular Class of Norte National High School were used as samples of the study. All Grade 10 SSC, SPA, and SPS students were taken as respondents while sample size for the Regular class was determined using Slovin's Formula with 0.05 as a margin of error. The data were analyzed and interpreted statistically using frequency counts, percentages, and Chi-square.

Results revealed that majority of the respondents have *visual* preference as their learning style using physical senses. As to exposure to learning situations, majority of them are *introverts*, while in terms of handling possibilities, most of them are *random-intuitive*. When dealing with ambiguity and with deadlines, receiving information and further processing information, majority of them are classified as closure-oriented, particular and synthesizing, respectively. Moreover, most of the respondents are tagged as sharpeners when committing material to memory and follows deductive style when dealing with language rules. Regarding the way they deal with multiple inputs and with response time, a bulk are classifying as field- dependent and reflective, respectively. As to manner of literally taking reality most of them are metaphoric.

It is concluded that the scientific inquiry skills of the students enrolled in the different curricular programs significantly differ from one another in some aspects. The Special Science Class students tend to have informed level of scientific inquiry skills.

These include the significant relationship between handling possibilities and receiving information, and skills on planning investigation (on considering whether or not an investigation is an experiment);dealing with ambiguity and with deadlines, and receiving information and skill on planning investigation; handling possibilities and committing materials to memory and skill on conducting investigations and collecting data; dealing with ambiguity and with deadlines, and further processing information and skill on evaluating data and communicating findings; handling possibilities , dealing with ambiguity and with deadlines, and further processing information and skill on conducting investigations, collecting and evaluating data and communicating findings with the aspect that question drives the process; receiving information and further processing

information, and conducting investigations, collecting and evaluating data and communicate findings with the aspect that conclusions should be consistent with data collected.

ABSTRACT

RESPICIO, EDMUND T. Mariano Marcos State University. May 2020.
**TEACHERS' LEVEL OF KNOWLEDGE, ATTITUDE, EXTENT OF USE OF
INTERDISCIPLINARY CONTEXTUALIZATION (ICON) IN THE CLASSROOM AND
STUDENTS' MATHEMATICAL PROFICIENCY.**

Major Adviser: Lily Ann C. Pedro, Ph.D

Using descriptive-correlational research design, this study aimed to investigate relationships between and among teachers' socio-demographic characteristics and ICON-related characteristics. Likewise, the study also sought to establish relationship between students' mathematical proficiency and teachers' ICON-related characteristics. This was conducted in the Schools Divisions of Laoag City, City of Batac and Ilocos Norte during the School Year 2019-2020. It involved forty-four (44) Grade 7 mathematics teachers and one thousand one hundred eighty-seven (1187) Grade 7 students.

All the Grade 7 mathematics teachers in the selected schools were taken as respondents. The corresponding students are all taken as samples when the sample teacher handles only one section of Grade 7 students. For sample teachers handling at least two sections, simple random sampling was used. Frequency counts, percentage, mean and standard deviation were used to describe the teachers' socio-demographic characteristics, while mean was used to describe their ICON-related characteristics. Likewise, frequency counts, percentage and mean were used to describe the student's level of mathematical proficiency. Pearson's (r) moment of correlation was used to determine the relationship between the teachers' socio-demographic characteristics, the teachers' ICON-related characteristics, and the students' mathematical proficiency.

Findings show that there are more female than male teachers. The teachers are relatively young and new in the field of teaching. Majority of them have finished Bachelor's degree with Masters' units and most of them have attended only one ICON training. Their level of knowledge of ICON is average and their attitude towards ICON could be considered favorable. Meanwhile, their extent of use of ICON in the classroom is at Level 1 which is equivalent to a descriptive interpretation of lowly use. Findings further reveal that the students' competency level for conceptual understanding is at the developing level, while their procedural fluency is at the beginning level. It was found that the students' productive disposition in Mathematics is generally favorable.

Findings also show that the teachers' age and years of teaching experience are significantly related to their extent of use of ICON in the classroom. Thus, the teachers who are young and relatively new in the service tend to use ICON more frequently in their classroom.

A significant relationship was also found between each pair of the teachers' ICON-related characteristics. Teachers with higher level of knowledge and positive attitude towards ICON have higher extent of use of ICON in the classroom. Similarly, the teachers with higher level of knowledge and extent of use of ICON tend to have more positive attitude towards ICON.

ABSTRACT

BAROLO, RALPH KEVIN S. Mariano Marcos State University. May 2020.
PERCEIVED EFFICACY AND TEACHING PERFORMANCE OF FOOD TECHNOLOGY TEACHERS IN THE SENIOR HIGH SCHOOL.

Major Adviser: Engr. Ruben J. Dadalos

This study was conducted to determine the perceived efficacy and teaching performance of Seniro High School Food Technology teachers in the Division of Ilocos Norte. Specifically, the researcher investigated he teachers' socio-demographic characteristics, their levels of perceived efficacy, and teaching performance. Also, the mentioned variables were analyzed and interpreted to identify their relationships.

The study utilized the descriptive-correlational research designs using survey questionnaires, classroom observations and interviews. Data were taken from the Food technology teachers in the senior high schools in the Divisions of Ilocos Norte.

Results of the study reveal that there in terms of the relationships among teachers' socio-demographic characteristics, level of perceived efficacy, and teaching performance, there is a significant relationship between the teachers' : a) educational attainment and their perceived efficacy for classroom management and instructional strategies; b) teaching performance and perceived efficacy for classroom, management; and c) teaching performance and teaching position, years of teaching and educational attainment.

Evidence in this study about relationship among the variables highlights the importance of developing perceived efficacy among Food Technology Teaches in the senior high schools. The results of this study proved that teachers' judgments about their teaching competence influence their performance in teaching. These findings suggest that perceived efficacy development should be considered as means to address issues and problems in teaching food technology related subjects.

ABSTRACT

BATARA, MA. CRISTINA V. Mariano Marcos State University
December 2020. **SURVEY AND CHARACTERIZATION OF COCOYAM
GROWN IN THE PROVINCE OF ILOCOS NORTE.**

Major Adviser: Epifania O. Agustin, Ph.D

A field survey was conducted to document and characterize existing cocoyam cultivars in four municipalities (Dumalneg, Vintar, Solsona and Pagudpud) of the province of Ilocos Norte from November 2019 to February 2020 involving 42 farmers respondents. A focus group discussion was conducted to generate ethnobotanical information of the target plant species. Respondents' profile and related information were collected through interview schedule. The geographic location of the sampling sites was identified using a GPS receiver while the geomorphological characteristics were generated from the DEM of the province using ArcGIS. The collecting descriptors were taken/generated together with the morphological characteristics (qualitative and quantitative) of the collected cocoyam accessions using IPGRI and IBGR descriptors list for taro, respectively. Data were analyzed by SAHN clustering using simple matching coefficient and Euclidean distance coefficient for qualitative and quantitative data, respectively through NTSYS 2.10.

A total of 107 cocoyam accessions were collected, 88 of which were Colocasia and 19 were Xanthosoma. All the accessions were known to/or identified by the local folks in 15 ethnobotanical names. The majority were primitive landraces but some of them originated from adjacent municipalities and nearby provinces. All the Colocasia accessions were consumed as human food either whole plant or while only the corn and cormels for Xanthosoma. The petiole and leaves were fed to hogs. Geomorphological characteristics varied among collection sites but these were generally plains and uplands but some were waterlogged areas. Some cultivars were found in all collection sites but one or two accessions were unique to one or two sites. Colocasia and Xanthosoma can be distinguished from each other by the shape of the leaf base and the presence/absence of stolons. Qualitative and quantitative characters of both genera showed moderate and high diversity, respectively, but overall diversity was described as high.

The phylogenetic tree derived from the qualitative characters of the Colocasia accessions showed three main Clusters. Cluster A consisted of 30 accessions with two sub-clusters comprised of 13 and 17 accessions, respectively. Cluster B which consisted of 26 accessions was subdivided into six sub-clusters, while cluster C consisted of 32 accessions and was subdivided into four sub-clusters. Of the 88 accessions, 29 were distinct and unique. The other 59 accessions clustered into seven distinct sets appeared as duplicate of each other, For Xanthosoma, the phylogenetic tree derived from the qualitative characters gave two main clusters. Cluster A consisted of 17 accessions while Cluster B consisted

of two accessions. The former had two sub-clusters, A with 16 accessions and B with only one accession

In general, while overall mean diversity of the two cocoyam accessions was described as high, diversity among them was only medium in terms of the qualitative characters. Nevertheless, four cultivars were unique to one or two collection sites. Both *Coloasia* and *Xanthosoma* were still considered subsistence crop in the study sites. However, their documented ethnobotany indicates potential benefits of high commercial value.

ABSTRACT

BAUTISTA, RITCHIE G. Mariano Marcos State University, December 2020.
"PERFORMANCE OF SWEET CORN (*Zea mays* L.) AS AFFECTED BY DIFFERENT PHOSPHORUS FERTILIZER LEVELS AND INOCULANT.

Major Adviser: Dr. Artemio B. Alcoy

The experiment was conducted in Barangay Jordan, Sinait, Ilocos Sur during the dry season 2020 aimed to find out the effect of different phosphorus fertilizer levels and inoculant on the growth and yield performance. This was conducted to determine the growth and yield performance of sweet corn using different phosphorus fertilizer levels and inoculants, to compare the effect of with and without inoculant for green sweet corn production, determine the cost and return analysis of green sweet corn under different phosphorus levels with an inoculant. The experiment was laid out in strip plot design with three replication. Treatments were subdivided as Inoculant (Control, Bio-N, VAM and Bio-N + VAM) that served as vertical factor and five phosphorus fertilizer level of, F1 Control (no fertilizer), F2 130-50-50 kg NPK ha', F3 98-25-50 kg NPK ha", F4 98-50-50 kg NPK ha!, F5 98-75-50 kg NPK ha' as horizontal factor.

Results revealed that phosphorus fertilizer level of 130-50-50 kg NPK ha! performs better than any of the treatments in growth and yield performance, also it was revealed that significantly produced taller plants, more leaves, low barren plants, longer and larger ears, high total soluble solid, highest harvest index. While 98-75-50 kg NPK ha performed better percentage stand count. Moreover, it was found out that the sweet corn plant applied with VAM produced taller plants, more leaves, higher percentage stand count, while Bio-N+ VAM produced longer and larger ear and a high harvest index. This indicates the capability of the two inoculants that supply additional nutrients to the plant. Furthermore, plants performed better when applied with Bio-N and 130-50-50 kg NPK ha" with the highest net income (Php. 87, 094) and return of investment of 1.24%, followed by VAM and 98-75-50 kg NPK ha' with the second-highest net income.

ABSTRACT

BOLO, GILLIAN KARL D. Mariano Marcos State University. May 2021.
EFFECTS OF ONLINE AUTOMATED GRAMMAR TUTOR ON STUDENTS' ACCURACY IN WRITING.

Major Adviser: Ronald Candy S. Lasaten, Ph.D.

Using the descriptive research design, this study determined the effects of online automated grammar tutor, Grammarly, on students' accuracy in writing. Specifically, it investigated the level of writing accuracy of the students before and after using the online automated grammar tutor along contextual spelling, grammar, punctuation, sentence structure, and style and the perceptions of the students and the teachers towards its use.

The study was conducted at the Schools Division of the City of Batac involving the Grade 10 students of the City of Batac National High School Poblacion. These students were purposively selected for the study. Only those students whose first written outputs from the first quarter of Grade 10 English containing 200-250 words were the ones included in the study,

The main tool used in gathering data was the modified rubric patterned after the rubric developed by Glasswell and Brown (2003). The said tool was used to measure the students' level of accuracy in writing before and after using the online automated grammar tutor. An interview guide was also used to gather data on the students' and the teachers' perceptions on the use of the online automate grammar tutor. The data were statistically analyzed using frequency, percentage, standard deviation and mean. T-test was used to determine the significant difference of the variables.

Findings revealed that before the use of the online automated grammar tutor, the students' written compositions fall under the proficient level along with contextual spelling, grammar, punctuation, sentence structure, and style. However, after using the online automated grammar tutor, the students' writing accuracy level falls under very proficient level along with contextual spelling and punctuation. While the other criteria remained on the proficient level, there still an observed increase along with grammar, sentence structure, and style.

Results also revealed that there is a significant difference on the students' level of writing accuracy before and after using the online automated grammar tutor. The students' level of writing accuracy after using the online automated grammar tutor is significantly higher than their level of writing accuracy before using the said application. Lastly, results revealed that the students and the teachers perceive the online automated grammar tutor to have improved the students' writing skills. Also,

they perceive that the online automated grammar tutor has engaged the students in their writing activities and has offered them provisions for self-corrections.

ABSTRACT

BOSQUE, RICKY F. Mariano Marcos State University. May 2020. **CAPABILITY BUILDING PROGRAM FOR SCIENCE, TECHNOLOGY, ENGINEERING, MATHEMATICS (STEM) SCIENCE TEACHERS.**

Adviser: Artemio P. Seatriz, Ed.D.

This study developed a Capability Building Program for Science, Technology, Engineering, Mathematics (STEM) Science Teachers based on level of competency of teachers as perceived by themselves and their school heads along professional knowledge, pedagogical content knowledge and professional practice.

This research was conducted in the Department of Education (DepEd), particularly in the three-school division of Ilocos Sur with a total of fourteen (14) public secondary schools offering STEM strand. A total of sixty-one (61) STEM Science Teachers who are teaching either core subjects of specialized subjects to STEM students served as the respondents of the study.

Data were gathered through questionnaire adopted from the Science Framework for Philippine Basic Education of DOST-SEI and UP-NISMED. The tool is evidence-based and provides a baseline for the Senior High School, which is just beginning. Also, data were analyzed using frequency counts percentage, means, t-test of difference between mean of two dependent samples, Pearson r, point biserial and Chi square test of independence.

Results showed that the competency level of teachers along professional knowledge, pedagogical content knowledge and professional practice ranges from average to high.

Thus the capability building program is highly valid and it can be used to capacitate the STEM Science Teachers along professional, pedagogical content knowledge and professional practice.

ABSTRACT

BUGUASEN, ELENA R. Mariano Marcos State University, May 2020.
ORGANIZATIONAL COMMITMENT, QUALITY OF WORK LIFE AND QUALITY OF SERVICES OF FRONTLINE EMPLOYEES OF THE UNIVERSITY OF NORTHERN PHILIPPINES.

This study aimed to assess the organizational commitment, quality of work life, and quality of services of frontline employees of the University of Northern Philippines. The interrelationships of the major variables of the frontline employees' socio-demographic characteristics, organizational commitment, and quality of work life were also investigated in the study. The descriptive and correlational methods of research were used. Two types of survey questionnaire were used to gather data from 113 non-teaching employees who deliver frontline services and 124 clients who availed their services during the time of data gathering. The data collected statistically analyzed using frequency, percentage, and weighted mean. Pearson r and point biserial were also used to determine the correlations between and among the major variables. The findings are congruent to social exchange theory which is based on reciprocity that when an organization offers favorable working conditions, employees will feel satisfied, and in return, will be more committed to make an extra effort to perform better than what is expected from them.

ABSTRACT

BULOSAN,AIZA JANINE C. Mariano Marcos State University. July 2020. **ORAL READING MISCUES,RATE AND COMPREHENSION LEVEL OF GRADE 4 PUPILS.**

Major adviser: Jahnese D. Asuncion,Ph.D.

Using the descriptive-correlational research design, this study determined and analyzed the relationship among the oral reading miscues, rate and comprehension level of Grade 4 pupils.

The study was conducted at Burayoc Elementary School, pagudpud-Adams District, Schools Division of Ilocos Norte involving 42 grade 4 pupils-respondents. A purposive sampling technique was used to determine the respondents involved in the study.

The main tools used in gathering data were Phil-IRI Reading Rate, Score and Miscue Record Sheets. A time and audio were used to record the reading rate and pronunciation, respectively. The data were statistically analyzed using frequency, percentage and mean. Pearson's r correlation was used to determine the relationship between variables, The interpretation of the data was delimited to the interpretation of the researcher and assistant reading program coordinator.

ABSTRACT

CABELLO, JENNIE MAE I. Mariano Marcos State University. May 2020.
TEACHERS' STAGES OF CONCERN AND LEVELS OF USE OF THE PHILIPPINE
INFORMAL READING INVENTORY (PHIL-IRI).

Major Adviser: Ronald Candy S. Lasaten, Ph.D.

Using the descriptive-correlational research, this study determined the teachers' stages of concern and levels of use of the Philippine Informal Reading Inventory (Phil-IRI). The study was conducted at the Schools Division of Laoag City involving all the 134 English teachers conducting Phil-IRI in the different public elementary schools in the division. A purposive sampling technique was used to determine the teachers involved in the study.

The main tool used in gathering data were the Stages of Concern Questionnaire and Levels of Use Interview Protocol. The Concerns-based Adoption Model (CBAM) served as guide in identifying the teacher's stages of concern and levels of use of the Phil-IRI. Data gathered were supplemented using results of informal interviews conducted with the teachers. The data were statistically analyzed using frequency, percentage and mean, Pearson's r correlation was used to determine the relationship between variables.

ABSTRACT

CADANG, MILAGROS R. Mariano Marcos State University. May 2019.
IMPLEMENTATION OF DISASTER READINESS AND RISK REDUCTION (DRRR) IN THE SENIOR HIGH SCHOOLS.

Major Adviser: Dr. Natividad E. Lorenzo.

This study determined the extent of implementation of Disaster Readiness and Risk Reduction in the senior high schools of Claveria, Cagayan.

The descriptive research utilized total enumeration with the seven Science teachers who responded to the questionnaire and purposive sampling with the student-participants in the focus group discussions (FGD) of public senior high school students of Claveria West District of the Division of Cagayan during the school year 2018-2019. The mean ratings of the teachers' responses were obtained, analyzed and presented. The student's responses to question asked in the focus groups discussions were used to support the teacher's responses. Themes were drawn from the FGD results.

The findings of the study revealed that, as the teachers perceived it the DRRR lessons were very highly implemented with regard to learning competencies developed and content standards followed, which were affirmed by the positive responses of the FGD participants. The students were grateful for the concepts and skills they acquired on disaster education which they can use to prepare, mitigate, adapt and respond to the damaging effects of disasters. They also hoped this will elevate the public awareness on disaster, which hopefully reduce the numbers of victims caused by disasters.

The teachers' concerns on the implementing the DRRR subject in the senior high school curriculum are the following: lack of instructional materials in teaching DRRR, seminars and trainings fund to finance school activities related to this subject what will help in raising awareness on disaster and too many competencies' to cover a short period of time.

Thus, the very high level of implementation of the DRRR learning lessons with regard to competencies developed and content standards followed is an affirmation of the aim of the National Disaster Risk Reduction and Management (NDRRM) Framework which is to build a safer, adaptive and resilient Filipino community toward sustainable development.

ABSTRACT

COLOBONG, JOEMARK M. Mariano Marcos State University. May 2021.
**ARALING PANLIPUNAN TEACHERS' TECHNOLOGICAL PEDAGOGICAL
CONTENT KNOWLEDGE (TPACK) AND THEIR STUDENTS' ACADEMIC
PERFORMANCE.**

Major Adviser: Imelda L. Najorda, Ed.D.

This descriptive-correlational study determined the Araling Panlipunan (AP) 10 teachers' level of knowledge along Technological Pedagogical Content Knowledge (TPACK). It also determined the relationship between the teachers' socio-demographic profile and their level of knowledge along TPACK, and the relationship between the teachers' level of knowledge along TPACK and the academic performance of their Grade 10 students in AP 10. This study included the 59 AP 10 teachers from public junior high schools in the Schools Division of Ilocos Norte by means of total enumeration, while 2, 312 students served as student samples in the study. The socio-demographic profile of the AP 10 teachers, their level of knowledge along TPACK were determined using the Technological Pedagogical Content Knowledge (TPACK) Questionnaire, while the academic performance of Grade 10 students was determined by their final rating in the subject AP 10. Frequency, percentage, mean, standard deviation, were used to determine the teachers' socio-demographic profile, their level of knowledge along TPACK and the academic performance of the students. Meanwhile, Pearson's (r) moment of correlation, Lilliefors Corrected and Statistical Product Service Solutions (SPSS) for Social Science were used to determine the relationship between the teachers' socio demographic profile and their level of knowledge along TPACK. Likewise these were used to determine the relationship between the academic performance of students in AP 10 and the teachers level of knowledge along TPACK

The study revealed that the AP 10 teachers have a mean age of 35.22, dominated by female teachers, having 9.63 mean years of teaching experience and majority of them have earned master's units. In addition, all of them use ICT tools in their instruction, particularly laptop, mobile phones/smartphone and printer are the most commonly used tools by teachers. Moreover, majority of them have attended ICT - related trainings/seminars like basic computer literacy and information and operating systems, however, majority of them did not attend ICT-related trainings/seminars on Interactive Tools.

Results show that the teachers have high level of knowledge on content, pedagogy, technology and TPACK, while the academic performance of Grade 10 students in AP 10 is described as very satisfactory.

Findings show that the teachers' knowledge along content knowledge (CK) is significantly related to their sex and ICT - related trainings/seminars particularly on Interactive tools. The technological knowledge (TK) of the teachers is significantly related to sex, age and number of years of teaching, while the teachers' level of knowledge along technological pedagogical content knowledge (TPACK) is significantly related to their sex. Furthermore, the academic performance of the Grade 10 students in AP 10 is significantly related to the teacher's level of knowledge on TK and TPACK.

ABSTRACT

COLOBONG, JOEMARK M. Mariano Marcos State University. May 2021.
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ABSTRACT

COLUMNA, KAREN C. Mariano Marcos State University, December 2020 SURVEY AND CHARACTERIZATION OF COCOYAM GROWN IN LOWER APAYAO PROVINCE.

Major Adviser: Epifania O. Agustin, Ph. D.

A field survey involving 42 farmer-respondents was conducted in the four municipalities (Flora, Pudtol, Luna and Sta. Marcela) of Lower Apayao from November 2019 to February 2020 to document and characterize cultivated and wild cocoyam (*Colocasia esculenta* and *Xanthosoma* spp.) cultivars. Ethnobotanical information of the identified cocoyam cultivars were generated through focus group discussion. An interview schedule was used to generate information on the respondents' demographic profile and other information related to the culture and utilization of cocoyam. The geographic location of the sampling sites was identified using a GPS receiver while the geomorphological characteristics of the area were generated from the DEM of the province using ArcGIS. Collecting descriptors were described and/or characterized following the IPGRI's descriptors list for *C. esculenta* while the collected cocoyam accessions were characterized morphologically in situ following IPGRI descriptors list such as gross, leaf, corm, cormel and root characters.

A total of 65 accessions were collected, 41 of which were *C. esculenta* and 24 were *Xanthosoma* spp. Site characteristics influenced the diversity of both species as well the uniqueness or specificity of the identified cultivars in one or two collection sites. However, majority of the accessions do not require specific geomorphic and soil characteristics as they can thrive in any topography from plain to plateau regardless of drainage condition including stony/rocky substrates. The collected accessions belonged to two genera, *Colocasia* and *Xanthosoma*, and can be distinguished from each other by the color and position of petiole, and the presence of stolons. *Colocasia* had petiole color in its junction while *Xanthosoma* had none. The leaf base shape was peltate in *Colocasia*, sagittate in *Xanthosoma*. Additionally, stolons were evident in *Colocasia* while absent in *Xanthosoma*. All the accessions were known to or identified by the local folks in 16 ethnobotanical names, the majority of which were primitive landraces. Based on Shannon-Weaver diversity index, overall diversity for the two cocoyam species was high. Both qualitative and quantitative characters contributed to high diversity of *Colocasia* but for *Xanthosoma*, only the quantitative characters showed high diversity. The qualitative characters showed medium diversity. One character showed a perfect variability but 10 characters were invariant. The phylogenetic tree derived from the qualitative characters of *Colocasia* gave rise to two main clusters, A and B. Cluster B was further subdivided into four sub-clusters. For quantitative characters, the tree plot gave two main clusters with cluster B having six sub-clusters. All the accessions were distinct and unique except five sets of duplicates which exhibited similarity in 31 qualitative characters. For *Xanthosoma*, the phylogenetic tree derived from the qualitative characters gave two main clusters. Cluster A with 11 accessions showed three sub-clusters while cluster B with 16 accessions had two sub-clusters. The identified cocoyam cultivars are still considered subsistence crop in the

study sites. However, their documented ethnobotany indicates potential benefits of high commercial value.

ABSTRACT

CRISTOBAL, JAY-AR A. Mariano Marcos State University. May 2017. **ORAL COMMUNICATION APPREHENSIONS AND ACADEMIC PERFORMANCE OF GRADE 7 STUDENTS.**

Major Adviser: Dr. Candy S. Lasaten.

The descriptive study aimed to describe and analyze the relationship between the oral communication apprehensions (CA) and academic performance in English, Mathematics and Science of the Grade 7 students.

The participants of the study were the 371 Grade 7 students who were officially enrolled in the 22 public secondary schools in the Division of Ilocos Norte for the School Year 2016-2017.

The data on students' level of oral communication apprehension were gathered using the McCroskey's (1984) Personal Report of Communication Apprehension (PRCA-24). Meanwhile, the data on students' academic performance in English, Mathematics and Science were gathered from their report cards for the school year 2016 – 2017.

Frequency, percentage distribution, One -Way Analysis of Variance (ANOVA), Pearson's r correlation, and t-test for difference were used to treat the data.

Findings reveal that the Grade 7 students exhibit varied degrees or levels of oral communication apprehension in English in all communication situations and their overall oral CA. Further, the study reveals that there exists a significant relationship between the Grade 7 students' level of oral communication apprehension and their level of academic performance in English, Mathematics, and Science , That is , if the students experience lower level of communication apprehension, they are more likely to have higher academic performance, but if the students exhibits higher level of oral communication apprehension, they tend to have lower academic performance.

ABSTRACT

DAMO, MARK DONELL A. Mariano Marcos State University. May 2020.
PEDAGOGICAL COMPETENCE-BASED TRAINING NEEDS OF LIFE SCIENCES TEACHERS ON THE SPIRAL APPROACH.

Major adviser: Aleli R. Martin, MAEd.

This descriptive study determined the pedagogical competence-based training needs of life sciences teachers on the spiral approach. The study identifies needs of life sciences teachers that could serve as a basis for the development of a pedagogical competence-based training program.

Forty-three (43) Junior High School life sciences teachers and (7) administrators or school heads from all public secondary schools of the City Schools Division of Laoag City were chosen as respondents in the study. The pedagogical competence of life sciences teachers on the spiral approach, problems encountered when employing teaching strategies and utilizing instructional materials as well as the strategies used in the vertical and horizontal articulation of the spiral approach were determined using the Teachers Pedagogical Competence Questionnaire-Checklist (TPCQC). A focus group interview (FGI) with ten (10) life sciences teachers was conducted to collect deeper information to support the quantitative data. Meanwhile, the validity of the questionnaire-checklist and the focus group interview questionnaire was assessed by three (3) identified experts in the field of science education.

Frequency, percentage and average were used to analyze the data collected concerning the difficulties encountered when employing teaching strategies and utilizing instructional materials, and strategies used by life sciences teachers in the vertical articulation and horizontal articulation of the spiral approach. Meanwhile, rank was used to identify the most and least frequent factors. Moreover, mean was used to describe and to obtain the overall pedagogical competence of life sciences teachers based on the four (4) features of the spiral approach.

Findings revealed that life sciences teachers are pedagogically competent on the spiral approach. However, slightly competent results on some of the features of the spiral approach, analyses of the FGI, problems encountered when employing teaching strategies and utilizing instructional materials and various strategies employed by life sciences teachers to address the vertical and horizontal articulation revealed some pedagogical needs of life sciences teachers in the implementation of the spiral approach.

The identified needs of the study were the following: mastering the process of revisiting topics; addressing the successive levels of difficulty of the subject matter; taking reflective actions to curriculum gaps; bridging the gaps; conducting monitoring, assessment and evaluation of learning process and outcomes; utilizing relevant teaching strategies needed for instruction; localizing and indigenizing and contextualizing instructional materials and strengthening the know-how on varied teaching strategies. A proposed pedagogical competence-based training

program was developed in order to address the identified needs and to enrich the pedagogical competence of life sciences teachers in the K to 12 curriculum.

ABSTRACT

DANZALAN, ANGELA P. Mariano Marcos State University, May 2021.
mSEW LEARNING APPLICATION IN GRADE 9 DRESSMAKING.
Major Adviser: Ruben J. Dabalos, MTE

This descriptive study utilizing the Research and Development design was conducted for the purpose of developing, validating, and testing the level of acceptability of the mSew Learning Application for Grade 9 Dressmaking to adhere the needs of learners in understanding the topics of Grade 9 Dressmaking curriculum. To determine the said topics, a survey was conducted among teachers of the three divisions.

The result of the survey served as the springboard in developing the mSew. The material was anchored in inclusion of IPO model as a blueprint in developing the materials.

The design of the material was undertaken by incorporating the different salient features anchored on the principles of computer aided instruction and theory of constructivism integrating ICT-based strategies.

The weighted mean was used to describe the content validity of the mSew. The result of the validation revealed that the mSew is highly valid in terms of objectives, content, and presentation. More so, the result of the software validation revealed that the mSew is highly valid in terms of functional suitability, performance efficiency, compatibility, maintainability, and portability, while the level of acceptability of the mSew is highly acceptable in terms of objectives, content, illustration, and features. The findings indicate that the mSew is a highly recommended instructional material in teaching Grade 9 Dressmaking.

ABSTRACT

DE LA CRUZ, BRYAN REY T. Mariano Marcos State University. May 2021.
EFFECTIVENESS OF DRAW IN TEACHING GRADE 8 MECHANICAL DRAFTING

Major Adviser: Robert A. Salvador, Ed.D.

This study utilized the true experimental research design, specifically the pretest-posttest two-group design where two heterogeneous sections were used to determine the effectiveness of the developed iDraw in teaching Mechanical Drafting concepts. A needs-assessment survey on the topics in Mechanical Drafting & was administered prior to the development of the material. The iDraw was anchored to the multimedia learning cognitive theory and theory of constructivism. A panel of evaluators who were chosen purposively evaluated the validity of the iDraw in terms of its objectives, content quality, instructional quality, technical quality and software using a validation rating scale. The weighted mean was used to describe the content validity of the iDraw. Frequency distribution, percentage, mean and standard deviation were used to describe the performance of the students in the pretests and posttests. The t-test of difference between dependent samples was used to find out if there is a significant gain in the test scores within each of the experimental group and control group. Moreover, the t-test of difference between means of two independent samples was used to compare the two groups to determine the effectiveness of the developed iDraw.

The results of the validation revealed that the iDraw is highly valid in terms of objectives, content quality, instructional quality, technical quality, and software quality. The validated iDraw was tried out to Grade 8 Mechanical Drafting Students of Sarrat National High School during the 201 Quarter of School Year 2020-2021. The control and experimental groups were composed of two heterogeneous Grade 8 students of similar abilities which were randomly assigned. A pretest was done to determine the students' entry knowledge and posttest to find out if there was a significant improvement on the performance of students.

The results of try-out showed a significant difference between the pretest and posttest mean scores of the two groups. This indicates that both groups acquired the target essential competencies. However, a comparison of the posttest means scores of the two groups revealed that the experimental group scored significantly higher than the control group. The iDraw's interactive features enabled students to participate actively in learning Mechanical Drafting. Student engagement when enhanced propel them to try, work and learn more on the assigned task in the activities. Thus, their interest to learn using the iDraw is highly shown in their performance.

This is an indication that the iDraw is effective in teaching Grade 8 Mechanical Drafting concepts.

ABSTRACT

DELOS REYES, MITCH JOE VILLA. Mariano Marcos State University. July 2020.
PATHOGEN SCREENING OF DOST-ASSISTED BANANA CHIPS PRODUCED IN PANGASINAN.

Major Adviser: Prima Fe R. Franco, Ph.D.

This study aimed to detect pathogenic microorganisms, determine the water activity and microbial load using the innovative process flow detection method on products of DOST-assisted manufacturers located in Pangasinan. The study was conducted from January 2020 to May 2020 at Molecular, Microbiology and Biotechnology Laboratory, Department of Biological Science of the College of Arts and Sciences.

Using the standard method for detecting pathogenic microorganism through selective media, results showed that almost all pathogenic microorganism are present in raw material which, i.e. banana, itself namely; *L.monocytogens*, *Salmonella sp.*, *S coli*, *P.arruginosa* and molds. Although the researcher wants to emphasize that there are also several factors that might have caused this. For instance, the environment and the level of proper and clean production by the manufacturers. The latter stages showed lesser and almost repetitive appearance of pathogenic microorganisms, i.e. *L. monocytogens*, *Salmonella sp.* And *S. aureus*.

ABSTRACT

DE LOS SANTOS, KENNETH C. Mariano Marcos State University May 2021. **IMPLEMENTATION OF THE WORK IMMERSION PROGRAM OF THE TVL TRACK AND STUDENTS' PERFORMANCES.**

Major Adviser: Robert A. Salvador, Ed.D.

This study determined the level of implementation of the work immersion program of the TVL track and students' performances of Bacarra National Comprehensive High School and Ilocos Norte College of Arts and Trades. Specifically, it examined the level of implementation of the work immersion program along Curriculum Implementation, Delivery Process, Assessment, Supervision and Administrative Concerns. Meanwhile, it identified the level of performances of the TVL students in the work immersion program along team work, communication, attendance and punctuality, productivity/resilience, initiative/proactivity, judgement/decision making, dependability/reliability, attitude, professionalism, and skills. Also, problems and challenges encountered in the implementation of the work immersion program were also determined.

The study utilized the descriptive-correlation study as it ascertained the relationship between and among the variables.

Findings showed that the level of implementation of the work immersion program is very highly implemented and the TVL students have a high level of work immersion performances. Also, the results from this study indicate positive relationship between the level of implementation of the work immersion program along administrative concerns and the students of performances along team work, attendance/punctuality, dependability/reliability, and skill. Evidence in this study about the relationship among level the variables highlights the importance of the role of the administration in the performances of the students in their work immersion. Also, the problems and challenges mentioned are to be given attention and consideration by the concerned authorities.

ABSTRACT

DULDULAO, WHELLALYN G. Mariano Marcos State University. May 2021 **READING COMPREHENSION LEVELS AND METACOGNITIVE STRATEGIES OF GRADE 10 STUDENTS: THEIR IMPLICATIONS TO THE TEACHING OF READING IN THE SENIOR HIGH SCHOOL.**

Major Adviser: Bert A, Gamiao, Ph.D.

This study identified the reading comprehension levels and metacognitive strategies of Grade 10 students, determined their correlation and the implications to the teaching of reading in the Senior High School. Employing the descriptive-correlational research design, this study involved 246 Grade 10 students from the Schools Division of The City of Batac who answered through online the 30-item reading comprehension test and the survey questionnaire of metacognitive strategies to gather the data needed. The sample of the study was determined using proportional sampling technique.

Findings show that respondents' reading comprehension falls under frustration level in all the nine macro skills. Among the metacognitive strategies, the three most applied when students experienced reading comprehension difficulties are: (1) I read slowly but carefully to be sure I understand what I am reading; (2) I try to understand one paragraph before proceeding to the next one; and (3) When a reading text becomes difficult, I pay closer attention to what I am reading.

In addition, there is a significant relationship between the skill in vocabulary and metacognitive strategies: I try to understand one paragraph before proceeding to the next one and when a reading text becomes difficult, I pay closer attention to what I am reading. In terms of the skill in sequencing, it is significantly related to the metacognitive strategy: I try to get back on track when I lose concentration and I try to understand one paragraph before proceeding to the next one. The students' skill in inference is significantly related to the metacognitive strategy: I picture or visualize information to help remember what I read and I go over a reading text for several times until I can understand it. The skill in drawing conclusion is significantly related to the metacognitive strategy: When a reading text becomes difficult, I pay closer attention to what I am reading. There is also a significant relationship between the skill in relating background knowledge and the metacognitive strategy: I predict what will happen after reading a text/story. The five macro skills in reading: vocabulary, sequencing, inferring, drawing conclusion and relating background knowledge are significantly correlated with some of the metacognitive strategies. The skill in summarizing is not significantly correlated with any of the metacognitive strategies while comparing and contrasting skill has a negative correlation with I take down highlight difficult words and use dictionary to unlock meanings and use them in sentences. In addition, the skill in

finding the main idea has a negative correlation with / discuss and solve the doubts related to the reading text with my teachers and friends, and I stop from time to time to think about what I am reading. Further, the skill in distinguishing facts and opinion is also negatively correlated with 7 predict what will happen after reading a text/story.

Overall, significant relationships were found when specific performance in macro reading skills was paired with the individual metacognitive strategies employed by the learners.

The findings on the Grade 10 students reading comprehension level and metacognitive strategies brought about implications to the teaching of reading in the senior high school.

ABSTRACT

DULDULAO, INANAMA MAYBELLE D. Mariano Marcos State University. May 2020. **IMPLEMENTATION OF THE CONSTRUCTION SAFETY AND HEALTH PROGRAMS OF CONSTRUCTION COMPANIES IN ILOCOS NORTE.**

Major Adviser: Margarigat G. Hilario, D.P.A

Using a descriptive research design, this study determine the level of implementation of construction safety and health programs (CHSP) of construction companies in Ilocos Norte as perceived by the management, workers and the general public along with the following components : company safety and health policy; construction safety and health committee; emergency occupational health personnel and facilities; safety and health promotion and education; toolbox meeting; accident / incident/illness investigation and reporting; personal protective equipment (PPE); protection of the general public; safety signages; construction workers skills certification; testing and inspection of construction heavy equipment; control measures on construction activities; first -aid, health care medicines and equipment facilities; workers welfare facilities; medical surveillace; working hour and break time construction waste disposal; emergency preparedness and penalties/sanctions.

Twenty-five construction companies with office addresses in the Province of Ilocos Norte and with on-going Department of Public Works and Highways (DPWH) projects at the span of the study were purposively chosen as samples of the study. The study was delimited to the perceptions of the management represented by their project engineers; the workers of the same construction companies represented by their foreman; and a member of the general public who was assumed to be very observant of the construction activities. Frequency and percentage were used to analyze the data collected on the profile of the constructions companies while mean was used to analyze the data collected regarding the levels of implementation.

Findings showed that the CHSPs of construction companies in Ilocos Norte are moderately implemented. CHSP are being observed by the construction companies however, it is only for compliance and not a full commitment.

It was also found that funding's for CHSP is incorporated in the programs of work of the companies, but is not sufficient to maintain the highest level of implementation set by the occupational safety and health (OSH) standards since not all are considered in the program of work (POW), rather, related accessories are to the account of the construction companies.

In, addition, presence of trained personnel at every project site to man the implementation of the CHSP was affirmed to be vital to constantly remind the workers of the safety and health rules nad regulations, thereby ensuring the protection of the workers together with the general public. Moreover, firm implementation of the penalties/ sanctions to erring workers by the management is necessity to avoid further sanctions from monitoring agencies of the government. Construction safety and health is everybody's concern.

ABSTRACT

DULIG, RYAN A. Mariano Marcos State University. May 2020. **COMPETENCY-BASED IMPROVEMENT PLAN FOR PUBLIC ELEMENTARY SCHOOL HEADS.**

Major Adviser: Jovenita A. Aragon, Ed.D.

Using the descriptive research design following the Research and Development 9 R7D) methodology. This study involved 117 public elementary school heads and 132 key teachers in the Schools Division of Ilocos Norte.

The study used a survey questionnaire for both school heads and teachers patterned after the National Competency Based Standard for school Heads (NCBSSH) to determine the extent of implementation on the principles, knowledge and processes. Likewise, a content validity ratings scale instrument was used to validate the developed plan. Frequency count, percentage, mean and t-test were used to treat the data gathered.

Findings reveal the demographic profile of the school heads such as personal (age, sex, civil status) and professional characteristics (educational attainment, length of service, numbers of years as school head, trainings attended related to management). Meanwhile the competencies of the school heads on school leadership, instructional leadership, creating a student-centered learning climate, human resource management and professional development, school management and daily operations and personal and professional attributes and interpersonal effectiveness are *often* implemented. Along with this the problems related to the implementation of the NCBSSH are *serious*.

In addition, there is a significant difference between the self-rating of the school heads and the cross-checking of the key teacher.

The competencies which are often implemented and the problems which are serious served as bases in the development of a competency-based improvement plan. Anchored on Macquisto's Theory of Institutional Planning, the developed plan has the following parts: 1) objectives; 2) activities; 3) persons involved; 4) time frame; 5) budgetary requirements and 6) success indicators.

It is further revealed that the developed plan is *highly valid*. Thus, it is feasible for the implementation in the improvement of the competencies among school heads.

ABSTRACT

GALZOTE, FILIPINAS GACULA. Mariano Marcos State University, May 2019.
TEACHERS' LEVEL OF KNOWLEDEG AND EXTENT OF IMPLEMENTATION OF MULTIGRADE TEACHING IN THE PUBLIC ELEMENTARY SCHOOLS.

Major Adviser: Dr. Artemio P. Seatriz.

Using the descriptive – correlational reseach dsign, the study described the teachers' level of knowledge and extent of implementation of the essential aspects of multi grade teaching in the public elementary schools of the Division of Ilocos Norte. It also determined the relationship between the teachers' knowledge and the extent to which they implement the essential aspects of multi grade teaching. Problems encountered by multi grade teachers were also identified as well as their best practices in the implementation of multi grade education.

One hundred thirty-seven (137) multigrading teachers from public elementary schools in the Schools Division of Ilocos Norte were involved in the study. Their level of knowledge and extent of implementations were determined using a validated researcher-made questionnaire.

Data were analyzed using frequency counts and percentages, mean, standard deviation, t-test for dependent samples and Pearson r and point-biserial correlation. In all test of significance, the level of significance was set at the .05 probability level.

Results revealed that the teachers have highly adequate on the six essential aspects of multigrade teaching, namely: philosophy, principles, requirements, procedures, and processes, curriculum and facilities.

Meanwhile, both the teachers and their school administrators perceived that multigrade in the public elementary schools in the Division of Ilocos Norte have been implemented to a great extent. The administrators have observed that the teachers put into practice the essential aspects as multigrade teaching.

Results further revealed that the teachers' socio – demographic characteristics are not significantly related to their knowledge and extent of implementation of the multigrade teaching. On the other hand, the teachers' level of knowledge and extent of implementation on the six essentials aspects of multigrade teaching are significantly related to one another. Thus, the teachers; level of knowledge greatly influences their implementation of multigrade in their respective classes.

ABSTRACT

GAOIRAN, KENNETH JOHN S. Mariano Marcos State University. May 2021.
**FINANCIAL LITERACY AND QUALITY OF WELL-BEING OF THE
EMPLOYEES OF VENVI GROUP OF COMPANIES IN ILOCOS NORTE.**

Major Adviser: Errol John V. Valdez, Ph.D.

The research study was conducted to determine the level of financial literacy and quality of well-being of employees of Venvi Group of Companies in Ilocos Norte. It also determined the differences in the level of financial literacy and quality of well-being and the relationship of financial literacy and quality of well-being of the employees. The study provides information to employees, not only of the Venvi Group of Companies' but also to other companies, on the importance of financial literacy and of enhancing their financial knowledge and skills through education and training to enhance the quality of their well-being. Such information can serve as the basis for companies to conduct financial literacy programs for the employees to increase their financial knowledge and management skills and enhance the quality of their well-being. The descriptive design was used to describe the profile, level of financial literacy, quality of well-being, and differences in the levels of financial literacy and quality of well-being of employees in the context of their profile. The correlation design was used to determine the relationship between the level of financial literacy and the quality of well-being of the employees. The study involved 224 randomly selected employees deployed in the 12 companies of Venvi in Ilocos Norte. Proportional allocation was used to determine the number of employees who participated in the study. A survey questionnaire was used in gathering data from the employees. The data were analyzed and interpreted using frequencies, percentages, mean, analysis of variance, and the Pearson product-moment correlation coefficient.

It was found out that majority of the employees of Venvi Group of Companies were young, male, single, bachelor degree holders, affiliated with Venvi Agro-Industrial Ventures, occupying rank and file positions, and whose primary source of income was their employment. Majority had been employed at Venvi from one to five years and have not attended trainings on financial literacy.

The employees had a high level of financial literacy which means that they were equipped with financial knowledge and skills, could formulate financial plans and make effective decisions in managing their financial resources. The quality of their well-being was generally good as they could earn income to enable them to provide for their and their families' basic needs, and have acquired enough resources which is a significant measures of their core and context well-being. In addition, they live in enabling environments in which family members, neighbors, and

communities are ready to help them in time of emergencies. There were significant differences in the level of financial literacy in terms of financial education, financial planning, and financial management based on the sources of income of the employees.

There were also significant differences in the core well-being and context well-being of the employees based from their position level and number of trainings attended on financial literacy. The study also found out that a significant relationship existed between level of financial literacy and quality of well-being of the employees which implies that an improvement in financial literacy leads to a better quality of well-being. The study concluded that the respondents' high level of financial literacy could be attributed to their ability to equip themselves with financial knowledge, financial plans, and skills in making effective decisions in the use and management of their financial resources and to provide financial security for themselves and their families. The significant differences in the levels of financial literacy and the quality of well-being of the employees imply the necessity for Venvi Group of Companies to provide assistance to employees to gain knowledge on financial literacy and promote quality of their well-being.

The study recommended that the respondents continue to equip themselves with knowledge to improve their financial literacy and give them a better outlook of their families' welfare vis-à-vis uncertainties. The Venvi Group of Companies may develop financial literacy programs and trainings to build awareness and help its employees become more knowledgeable and responsible in managing their finances. Further, more studies on financial literacy and quality of well-being considering other factors that were not included in the study should be conducted to provide more information on financial literacy and quality of well-being.

ABSTRACT

GARVIDA, DON DEXTER J. Mariano Marcos State University. May 2020. **AN INVESTIGATION OF MATHEMATICAL BRAIDS, KNOTS, AND LINKS IN RATTAN CANE WEAVING DESIGNS.**

Major Adviser: Michelle D. Reynera, Ph.D.

A mathematical braid is a collection of crossed strands whose pints of origin and whose endpoints are fix and unmoving. A mathematical knot is simply whose ends are joined together creating a continuous strand. Two of wore mathematical knots interwind with each other form a mathematical link.

This study aimed to investigate the mathematical braids, knots and links in rattan cane weaving designs. Specifically, it aimed to construct the mathematical braids present in the decorative parts of rattan cane weaving designs; identify mathematical braid properties in terms of braid word, braid transformations and braid symmetry; create knots and links from the identified braids; and determined the linking number of the created links.

Results of the investigation show that a mathematical braid is present in each of decorative parts of the five-rattan cane weaving designs. Moreover, the number of strands has no effect on the numbers of crossings of its corresponding braid.

Results of investigation show that among the five weave designs studied, the braids of four – way and six – way patterns underwent braid transformation using Rule 1. On one hand, the braids of the other three weave designs do not show any transformation. Moreover, the braid of the four – way pattern is a reflection symmetric while those of the other four braids are symmetric.

Results further show that there is no mathematical knot created in the braid of the five weave designs. However, each braid of the five weave deigns corresponds to a mathematical link. Here, the linking number was redefined using the concept of the braid word associated with the closed braid is a whole number while the linking number of a link associated with an odd closed braid is a fraction.

It is recommended that further studies investigating more weave designs of rattan products which are not presented in this study should be conducted.

ABSTRACT

GAUDA, RHOSEBE JOY RASAY. Mariano Marcos State Univeristy. July 2019.
COINCIDENCE SITE LATTICES OF HEXAGONAL LATTICES.

Adviser: Raymond Paul L. Eclarin.

This study primarily aimed to investigate coincidence site lattices hexagonal lattices in terms of algebraic integers. Specifically, it aimed to: 1) expose the algebraic integers associated with hexagonal lattices; 2) establish properties of algebraic integers associated with hexagonal lattices; and 3) determine coincidence site lattices of hexagonal lattices in terms of algebraic integers.

The results of the study show the studying the algebraic integers associated with hexagonal lattices lead to a better understanding of the structure of the said lattices. It also reveals an interesting pattern of the factors of the rational prime.

It is recommended that future researchers should: 1) study the conjectures and provide proofs; 2) reveal other properties of the hexagonal lattices; and 3) study color groups associated with hexagonal lattices as applied to the intersection.

ABSTRACT

GUARINO, EDMARIE A. Mariano Marcos State University. May 2019.
**ALEXANDER POLYNOMIAL AND JONES POLYNOMIAL AS KNOT
INVARIANTS OF A TORUS KNOT.**

Major Adviser: Dr. Michelle D. Reynera.

This study served as an introduction to Knot Theory, a branch of Topology. It aimed to: a) obtain visual images of $T(p, q)$ torus knots using the software called Knot Plot; b) determine the Alexander polynomial and Jones polynomial of $T(p, q)$ torus knots, and c) identify properties of the Alexander polynomial and Jones polynomial of $T(7, 9)$ torus knots, where p and q are relatively prime. Results of the study show the effectivity, efficiency and properties of the Alexander polynomial and Jones polynomial as knot invariants of a torus knot.

ABSTRACT

ESPEJO, RAYMUND VINCENT B., Mariano Marcos State University. May 2020,
CONSTRUCTIVIST STRATEGY-BASED RESOURCE MATERIALS IN TEACHING READINGS IN PHILIPPINE HISTORY.

Major Adviser: Prof. Carolyn G. Paguyo.

Using the descriptive research design employing the R and D methodology, this study aimed to develop Constructivists Strategy-Based Resource Materials in teaching Readings in Philippine History. The major steps in the R and D cycle by the researcher in preparing the resource materials are the following: Planning Stage, Development Stage, and Validation Stage.

Data were gathered using two instruments, namely: a) Survey Checklist to determine the lessons in Chapter I and III in Readings in Philippine History that can be best be taught using constructivist strategies that are best suited to teach each lesson ; and b) Content Validation Scale to determine the content validity of the Constructivist Strategy-based Resource Materials in teaching readings in Philippine History.

The content validity of the resource materials was determined using the mean. The results revealed that the Constructivist Strategy-based Resource Materials in teaching Readings in Philippine History met the basic requirements for developing instructional materials as manifested by the overall *very highly valid* descriptive rating.

The Constructivist Strategy-based Resource Materials in Teaching Readings in Philippine History is recommended for use and to further validate and determine its effectiveness, and so that it can be further revised and refined. Similar research is recommended to continue the development of Constructivist Strategy-based Resource Materials in other fields of Social Sciences.

ABSTRACT

ESPIRITU, RHEA R. Mariano Marcos State University. May 2021. **REEP DIVERSITY AND BIOCHEMICAL EVALUATION OF NEMATOCYSTS DERIVED FROM *Millepora tenera* (Nemenzo, 1975) Milleporidae IN BADCOC, ILOCOS NORTE**

Major Adviser: Andres Y. Tungpalan, MSc

Marine resources such as seaweeds and seagrasses have been utilized as pharmaceutical sources, while invertebrate's species, specifically the slow-moving organisms, are the only representatives of the faunal group used for this purpose. In this regard, the present study was done to highlight the capacity of corals as a possible source of secondary metabolites, which may be a potential source of ingredients to combat the growth and survival of pathogens. Moreover, the study aims to evaluate the synergistic effect on *Artemia salina* nuplii.

Identification of coral species present in the site was made to assess dominant and thriving species using updated methods formulated by various authors. A total of 34 species of corals were observed thriving around the island. Generally, the area is dominated by submassive, massive, and encrusting corals species. They were found at deeper depths where the environment is at its best for them to survive, such as temperature and light. In contrast, branching species were found to compete with seaweeds and other associated flora and fauna at a shallower depth. Evaluation of how healthy they are was done by documenting natural and human triggered disturbances affecting their growth. Observed disturbances around the island were categorized into four: diseases (tissue necrosis and pink line syndrome), human and weather exposure, invasive species/predation such as *Drupella* spp., and species of seaweeds, which seemed to affect the growth of coral species around the island. Characterization of nematocyst of *Millepora tenera* was done. The microscopic activity revealed that macrobasic b-mastigophores were found abundantly in the extract.

Undischarged nematocysts that look like an egg-shaped capsule and discharged nematocysts with everted tubule were observed. Evaluation of secondary metabolites proved flavonoids, phenolic compounds, tannins, and alkaloids in the extracted nematocyst of *M. tenera*. Color reaction, precipitate formation, and other remarkable changes or observations on the extracted nematocysts were the basis for the presence or absence of the bioactive compounds.

Extracted nematocysts were used to evaluate the biological activity against pathogens, namely: *Staphylococcus aureus*, *Candida albicans*, and *Escherichia coli*. In the case of *E. coli*, prepared concentrations surpassed the ability of the positive control, Clindamycin, in inhibiting their growth. Results show that *E. coli* has high sensitivity and specificity at 75% to 100% *M. tenera* extract, respectively. For *S. aureus* and *C. albicans*, prepared concentrations failed to surpass the efficacy of the positive control, but a mild effect on inhibition

and thinning of bacterial growth was observed. Microbial activity is attributed to the synergistic effect of observed secondary metabolites in the extracts.

Toxicity assay was done using *Artemia salina* nuplii against the prepared concentration. The assay was divided into two: the range finder and the specificity test. Specificity test shows that extract of *M. tenera* is highly toxic at 0.05% to 0.1%. decreases.

Observation shows positive relation such that as concentration decreases, toxicity level. With the prevailing scenario that different pathogens become the cause of various diseases, various studies done by researchers searching for alternate source cures to these diseases are given utmost importance.

ABSTRACT

JIMINEZ, JULIUS I. Mariano Marcos State University. July 2020. **QUANTIFYING IMPACTS OF CLIMATE AND LAND USE CHANGE ON GROUNDWATER HYDROLOGY AND SUSTAINABILITY OF THE QUIAOITRIVEN WATERSHED.**

Major Adviser: Dr.Nathaniel r. Alibuyog.

Water is one of the most important resources around the world. Some have plenty, some have scarcity. As the world's population increases, the demand for water also increases. Yet, due to intensive human interaction to nature (e.g. Agricultural expansion, deforestation, urbanization), the supply of water is in danger due to land use and climate changes. With less technology to simulate the impacts of the tow global issues in developing countries, water resources would gradually be unavailable. Groundwater, the most alternative reliable water resource is one of the toughest to manage for water supply.

Thus, in this study, The Soil and Water Assessment Tool 9 SWAT) and the SWAT-MODFLOW were used to simulate the impact of land use and climate change on the QRW groundwater hydrology and sustainability. Specifically, the study aimed to: (1) characterize the watershed groundwater hydrology in terms of groundwater recharge and groundwater heads; (2) compare the simulated and observed groundwater heads; (3) simulate the impact of land use change using historical change, municipal land use plan, and future demand for land use conversion;(4) simulate the impacts of climate change on groundwater hydrology using 2035 and 2050 PAGASA scenarios; (5) simulate the combined impacts of the land use and climate changes; (6) provide policy recommendation based on the result of the model towards groundwater sustainability.

The results of the study show that the SWAT model can adequately simulate the streamflow with coefficient of determination (R^2) of 0.847 to 0.955. The simulated streamflow responds to rainfall events. The model also characterized the watershed with 9.28 to 373.96 mm/year groundwater recharge. The watershed has a water table that ranges from 12.04 to 230.54 cm.

The SWAT and the SWAT -MODFLOW revealed that converting five percent of agricultural land to urban would decrease the annual recharge of 31, 094 m³ in the watershed and 30,829 m³ in urban areas. It is also revealed that converting 10% of agricultural land to urban areas, 50% of grassland to agricultural, and 50% of forest area to grass land would increases the groundwater recharge of 4,791 m³, while, decreases the urban groundwater recharge of 39, 380 m³ per year. Simulating the 2035 scenario would increase groundwater recharge by 4,283,114 m³ per year. While, simulating the 2050 climate projection increases the annual recharge of groundwater by 5,475,714 m³ the recharge varied on a monthly basis on both climate projections. While, the individual changes have varied impacts to groundwater, the combined impacts of land use had also a different response on the groundwater recharge. The LUCC1 increases the watershed groundwater recharge of 4,277,427 m³ per year, while LUCC2 increases about 5,46,338 m³ per year

of the watershed groundwater recharge. Considering the extraction and different demands of water in the watershed, the groundwater recharge and storage can meet the demand for water for the next 15 years. Yet, the study revealed that wet season becomes wetter, while dry season becomes drier. Under land use and climate projections, monthly groundwater supply will become very complicated. It is therefore recommended that a municipal policy should be implemented to protect the groundwater resources against exploitation. A policy that could mitigate the effect of climate and land use changes on groundwater resources.

ABSTRACT

JULIAN, KIRBY LIAM BRETT O. Mariano Marcos State University. May 2020. **JOB SATISFACTION AND PERFORMANCE OF HIGH SCHOOL TEACHERS IN THE SCHOOLS DIVISION OF ILOCOS NORTE.**

This descriptive-correlational study aimed to describe and analyze the relationship between the high school teachers' level of job satisfaction and level of performance.

The participants of the study were the 283 high school teachers from 26 public secondary schools in the Division of Ilocos Norte.

The data on the teachers' level of job satisfaction were gathered using the questionnaire Mohrman-Cooke-Mohrman (1978) Job satisfaction Scale (MCMJSS). The data on the high school teachers level performance were gathered from their Individual performance Commitment review Form (IPCRF) for the school year 2018-2019.

Frequency, mean, percentage distribution, Pearson r correlation were used to treat data.

Findings reveal that the high school teachers have varied degrees or levels of job satisfaction. The majority of them have *moderate level* in intrinsic, and extrinsic and overall job satisfaction, respectively.

Also, the high school teachers' profile such as age, civil status, position and salary grade, length of services and nature of appointment are significantly related to their level of job satisfaction.

Moreover, their profile such as position and salary grade, length of service, assigned designation and nature of appointment have significant relationship to their level performance.

Further, the study reveals that there exists significant relationship between the high school teachers' level of intrinsic satisfaction and level of performance, that is, if the high school teachers experience lower level of intrinsic satisfaction, they are more likely to have lower level of performance. On the other hand, if the teachers have higher level of intrinsic satisfaction, they tend to have higher level of performance.

ABSTRACT

LABBAO, LOREEN PHIEMA I. Mariano Marcos State University. July 2019. **AN INVESTIGATION ON COMPOUND TESSELLATIONS.**

This study primarily aimed investigate compound tessellations in the Euclidean Plane, the sphere and the hyperbolic plane.

More specifically it aimed to: 1) construct models and 2) identify the symmetry groups of the regular self-dual compound in the a) Euclidean plane) sphere; and c) hyperbolic plane.

This research study was able to provide models of some of the regular self-dual compounds. Also, it was able to identify the symmetry groups of the constructed compounds.

It is recommended that future researchers provide models of the dual pairs and the self-dual compounds, from the various planes, that were not modeled and to identify their symmetry groups, as well.

ABSTRACT

LABASAN, LAWRENCE BRIAN REYES. Mariano Marcos State University
May 2021. **EXTENT OF IMPLEMENTATION OF REVENUE-GENERATION
STRATEGIES AND REVENUE-GENERATION PERFORMANCE OF THE
MUNICIPALITIES IN ILOCOS NORTE.**

Major Adviser: Errol John V. Valdez, PhD.

The research study determined the extent of implementation of the revenue-generation strategies and revenue generation performance of the municipalities in Ilocos Norte. The descriptive research design was used to describe the extent of implementation of the revenue-generation strategies and the revenue-generation performance of the municipalities.

A survey questionnaire was used to gather data on the extent of implementation of the revenue-generation strategies from the respondents. Documentary analysis was used to determine the revenue-generation performance. The data were analyzed and interpreted using, frequencies, and percentages. It was found out the local government units strongly implemented the revenue target setting strategies while the strategies for tax education and information campaigns, tax collection enforcement, and tax collection of delinquent taxpayers were moderately implemented.

Along the revenue generation performance from 2015 - 2019, the local government units mostly obtained positive performance in terms of revenue growth except in 2017 were most of them performed below the benchmark. For the per capita growth of locally sourced revenues from 2015-2019, the municipalities were able to perform above the benchmark. In terms of locally sourced revenues to total LGU revenue, the municipalities were able perform slightly above the benchmark from 2015-2019.

The municipalities slightly performed below the benchmark in terms of annual regular income to total LGU revenue from 2015-2019. In terms of total revenue office operations cost to locally sourced revenue, the municipalities in Ilocos Norte were able to perform better but below the benchmark. Lastly, in terms of the real property tax collection efficiency, the municipalities were able to perform above the benchmark.

The study concluded that the strong implementation of the revenue-generation strategies suited for the municipality in terms of tax collection enforcement, tax information and education and tax collection on delinquent tax payers would improve the collection of locally-sourced revenues of the municipality particularly on the real property

taxes. Moreover, administration of revenue generation is costly. Revenue target setting strategies guide the municipal treasurers and revenue collectors to effectively appropriate enough expenses for the revenue offices.

This study recommended that municipalities should employ additional collectors to improve the implementation to revenue generation strategies. The municipalities should also develop new strategies or adopt effective strategies used by other municipalities through the conduct of benchmarking activities. Furthermore, for the municipalities to be able to meet their targets and become efficient in the collection of real property taxes, the municipal treasurer should always monitor and update the databank of delinquent real property taxpayers and send notices of delinquency to them effectively by asking the aid of barangay officials to deliver such notices. If the revenue target seems to be difficult to collect, the treasurer should make counter projections

In addition, the assessment values of the real property taxes should be revised every three years. If the province is unable to conduct revisions on time, the municipalities should make an appeal to the Provincial Government of Ilocos Norte to conduct such revision for them to update the valuation of real properties to increase tax base.

ABSTRAK

LORENZO, CARMENCITA POLENDEY, Tesis ti Masterado, Pagadalan a Graduado ti Universidad Estado ti Mariano Marcos, Disiembre 2020. **PANAGIYALISON A KAS PANAGSAREB ITI KASO TI DANGADANG BENSA 1-12.**

Nangiwanwan: Rosabel L. Acosta, Ed.D. ken Aurelio Solver Agcaoili, Ph.D. Nainaw daytoy a sosio-linguistik a sukisok manipud kadagiti agtataruptop a problema iti pannakaiyimplementar ti Mother Tongue-Based Multi-Lingual Education, ngarud, gagem ti sukisok ti mangipaay iti solusion iti maysa wenno sumagmamano kadagitoy a problema. Nasirig manipud iti lente ti maysa a taga-uneg ti kultura nga Ilokano a mangibinsabinsa kadagiti isiu iti panagiyalison a nagdalanen ti sumusukisok iti panangiyalisonna kadagiti umuna a sangapulo ket dua a bensa ti Dangadang, novela a sinurat ni Dr. Aurelio Solver Agcaoili a nangiyalat iti 1998 Centennial Literary Prizeidi 1998 idi a naselebraran ti sentenario ti wayawaya ti Filipinas. Nakaturong ti lente daytoy a panagiyalison iti uppat a dimension: linguistik, literari, historikal ken kultural akontexto. Naisurat ti original a texto iti Tagalog a nakaibalbalactan dagiti balikas, frase ken panarita nga Ilokano, maysa a wagas a namagtalinaed iti eksena' nga Ilokandia iti laksiid ti pannakaaramat ti Tagalog kas sors a lengguahe. Adda met naipattopattok nga Ingles a nagservi a pagtandaan kadagiti paniemna. Maysa a banag ti ipamatmat daytoy nga estilo iti panagibinsabinsa kadagiti kultural a detalie: isurona ti pannakaadaptar dagiti konseptonga Ilokano tapno mapagbalin a paset ti pagsasao a Tagalog, ket iti pannakaiyalison dagitoy, maretenner dagitoy a detalie. Ngarud, mabalin met nga adaptaren dagiti konsepto a Tagalog nga awanan kaibatogan iti Ilokano kas paset ti tesoro nga Ilokano, kas met laeng iti pannakaapropriar dagiti dadduma a ganggannact a balikas, nangruna ket adu abalikas nga Ilokano ti addaan iti pumada a kaibalogan iti Tagalog. Kastanto metti posibilidad iti dadduma pay a lengguahe a mabalin nga aramaten a pagsareban kadagiti napipintas nga adal para kadagiti agtutubo nga agad-adal iti Ilokano ken agtutubo nga Ilokano.

Impresentar daytoy a sukisok dagiti opasion a mabalin nga aramaten iti pannakaiyalison dagiti naagapad a bensa, ken nailawlawag dagiti kriteria iti pannakadesidir ti final nga opasion. Indatagna pay dagiti nasareb a konsepto wenno sanut babaen iti Inventario dagiti Sanut a Nasareb manipud kadagiti Kritikal a Texto iti tunggal dimension kas nadakamat itingato.

Nadakamat iti daytoy a sukisok dagiti literari ken linguistik a detalie mangipaay iti parikut iti panangiyalison. Imparangarangna dagiti nakalmeng a bugas dagiti nabagas a texto a naisapitsapit kadagiti linabag ti tunggal bensa, dagiti naipunipon a kultural a texto a mabalin a nalipatan ken linipaten ti agdama a generasion. Masapul a masareb dagitoy, tapno iti kasta, lumtuad ken maapresiarda manen, ket no kasapulan man a mataginayon ti dadduma kadagitoy, masapul a maikkan iti kritikal a pannakautob ti balor ken pateg dagitoy. Naibugasan pay dagiti pasagid panggep kadagiti kinadangkok dagiti ganggannaet a

nangrabngis iti kinatalingengen ti bukodtayo a lugar, kasta met iti kinamanaginbubukod dagiti agtuturay ken dagiti agintuturay.

Bayat nga ipagilapna iti lagiptayo dagiti kultural ken historikal a detalie panggep iti Kailokuan, ipakita daytoy a sukisok a nasken a subliantayo dagiti indigeno a balikas tapno mataginayon dagitoy, a saan ket nga iwalintayo tapno laeng awatentayo a maikonsiderartayo ti bukod nga ammo ken pannakaawat dagiti targettayo a mangbasa iti novela ken ti pannakaiyalisonna.

Kabayatanna, luktan met daytoy a panagamiris dagiti posibilidad iti pannakaparang ay ti pagsasao nga Ilokano babaen iti apropiasion ken equivalensia, iti kasta, uray makuna a teknikal wenno teknologikal dagiti balikas kadagiti subjekto a mangbukel iti aniaman a kurikulum, mabalina latta nga adaptaren wenno modifikaren dagitoy, banag a mangbukat iti nalawlawwa manen a multiverso ti panakaawat iti tay-ak ti Siensia, Teknologika, Humanidades, Ingenieria, ken Matematika iti pagsasao nga Ilokano.

Ipaneknek daytoy a panagsukisok a maysa met a personal a dangadang ti panagiyalison: adda met panagrinnisiris ti bukod a pannakaammo ken ti kalikagum a mangipaay iti nalawlawag ken hermeneutikal a pannakaawat iti texto a saan ket a transliteral a pannakaawat, iti kasta, awan ti makuna a panagubo wenno kultural a pukaw. a Ipakitana pay a saan a nasken a talawantayo ti universotayo nga Ilokos, fisikal man ken di-fisikal, tapno laeng maalubogtayo dagiti sursuro dayta a multiverso. Saan a nasken a lipatentayo ti Ilokano ken ti kina-Ilokanotayo tapno matun-oyantayo ti pannakaawat kadagiti dadduma a lengguahe.

Ngarud, iti pannakaiyalison ti Bensa Uno agingga iti Bensa Dose ti novela a Dangadang, ipaneknekna nga aggargaraw, sibibiag ti lengguahe nga Ilokano, kas met laeng iti dadduma pay a pagsasao iti lubong, ngarud, saan a mabalina erregan uray it pannakaibarangubongna iti bukodna a pagsarebon. Masapul a pagpundawuyentayo ti pannakilagudlagodna kadagiti nadumaduma a pagsasao tapno malyannatupna ti lagarna iti dua a lubong a paggargarawanna: ti bukodna nga uiverso ken ti dakdakkal pay a lubong: ti multiverso dagiti lengguahe a burnyok ti pannakawat Nasken nga aramidentayon daytoy tapno maalawtayo ti agarup agnguynguy-a a pannakaawat dapiti adalan kadagiti leksion a maipasango kadakuada, aglalo ita ta awan ti fisikal nga interaksion dagiti manursuro ken dagiti adalanda.

ABSTRACT

MACADANGDANG, VERONICA S. Mariano Marcos State University May 2021. **COMPLIANCE TO GOVERNMENT PROCUREMENT STANDARDS AMONG STATE UNIVERSITIES IN ILOCOS REGION.**

Adviser: Ninfa S. Asia, DPA

This study was conducted to determine the compliance to government procurement standards among state universities in Ilocos Region along procurement planning and procurement processes. Problems encountered in the compliance to the government procurement standards are also identified. It also assessed the relationship between the profile of the procurement participants and their level of compliance. The study was conducted in the four state universities in Ilocos Region namely Mariano Marcos State University (MMSU); University of Northern Philippines (UNP), MMSU LIBRAS Don Mariano Marcos Memorial State University (DMMMSU), and Pangasinan State University (PSU). Seven groups of respondents were involved in the study: Bids and Awards Committee (BAC) chair and members, BAC secretariat/procurement staff, accounting officer, budget officer, deans and directors.

The study employed the descriptive-correlation research design using questionnaires to gather the data needed in the study. The findings revealed that state universities had high level of compliance to government procurement standards in the procurement planning particularly on the preparation of Project Procurement Management Plan (PPMP) and Annual Procurement Plan (APP) and very high level of compliance in the procurement process through competitive bidding and alternative method of procurement as perceived by the procurement participants. Moreover, the Accounting Officers perceived that the state universities have a very high level of compliance to the government procurement standards.

Level of compliance to government procurement standards of procurement participants in the procurement planning and procurement process through competitive bidding had no significant relationship on their profile such as age, sex, civil status, highest educational attainment, present position/designation, employment status and number of years in the present position. Procurement process through alternative method of procurement (negotiated procurement, small value procurement and shopping) showed a significant relationship with the number of years in their present position. In totality, the profile of the procurement participants does not necessarily affect their level of compliance to government procurement standards.

Although state universities are complying to the government procurement standards, there are still problems encountered which cause delays in the procurement and sometimes failure of bidding. It was recommended that there must be a sincere

implementation of the procurement standards stipulated in the Republic Act 9184. Procurement participants are encouraged to attend capability development programs to enhance their knowledge and improve their performance on procurement.

ABSTRAK

MACATBAG, JONATHAN L. Tesis ti Masterado. Pagadalan a Graduado ti Universidad ti Estado ti Mariano Marcos, Mayo 2020. **PANANGRISUT ITI PARADOJA TI KOMENSURABILIDAD ITI PANANGIPATARUS ITI DANGADANG**

Nangiwanwan: Rosabel L. Acosta, Ed.D.

Naisurat ti novela a Dangadang ni Dr. Aurelio S. Agcaoili iti Tagalog a nakaiyabelan ti Latin, Ingles, ken Ilokano. Maipanggep daytoy iti gera para iti justisia, wayawaya, panagkaykaysa, ken igualdad. Gapu ta biag ni Ilokano ti agtartaray kadaytoy nga obra, rumbeng laeng a maisurat ken mabasa daytoy iti bukodna a pagsasao.

Naipatarus ti Dangadang manipud iti sors a lengguahe a Tagalog iti target a lengguahe nga Ilokano. Ginandat daytoy a sukisok a risuten ti paradoja ti komensurabilidad iti panangipatarus iti Dangadang, Bensa 23-32. Naidentifikar dagiti isiu ti komensurabilidad iti panangi patarus iti tunggal bensa. Kalpasanna, nailanad dagiti posible a a solusion ket napili ti maiyalubog. Nailawlawag pay no sapay a napili ti makuna a maiyalubog a solusion babaen kadagit prinsipio iti panagipatarus, Hermeneutika ti kangrunaan a duri daytoy a panagadal.

Dagiti isiu ti ekonomia ken kinasayud iti panagiyebkas, literal a panagipatarus, gramatika, panagretener iti original, ken prejuisio ket aggununay kadagiti nadumaduma a wagas iti tunggal bensa. Gapu iti dayta a kasasaad, ti tunggal isiu ket masapul a marisut babaen kadagiti partikular a pamuspusan a kas iti reduksion, reformulasion, transposision, retension, ken adaptasion nga agtunda iti posible a dinamiko nga equivalensia. Iti pangkadagupan, masapul a ti bugas ti original a texto ket maiyallatiw iti target a texto ket mavalidar daytoy babaen iti proseso ti panangisubli.

ABSTRACT

MADALIPAY, EMERALD MAY T. Mariano Marcos State Univeristy. May 2019.
AESTHETIC PLEASANTNESS AND COMPLEXITY OF AZULEJO PATTERNS.

Adviser: Lawrence Aeclarin, Ph.D.

This study primarily aimed to determine the aesthetic pleasantness and complexity of mathematically generated *azelejo* patterns. Specifically, it aimed to determine properties of the fundamental octant of a fundamental N-square in azulejo patterns and establish a formula for determining the complexity of an octant. This study was able to establish properties of the fundamental octant *azulejo* patterns. Also, this study was able to provide a formula in determining the complexity of the octants. Lastly, the level of aesthetic pleasantness of the *azelejo* patterns in terms of complexity were determined.

ABSTRACT

MANGABAT, NELD LLOYD D. Mariano Marcos State University, December 2020. **STAKEHOLDERS' TRUST AND SATISFACTION ON THE PERFORMANCE OF POLICE OFFICERS IN ILOCOS NORTE.**

Adviser: Margarita G. Hilario, DPA

This study measured the stakeholders' trust and satisfaction on the performance of police officers in Ilocos Norte along with law enforcement, prevention and control of crimes, maintenance of peace and order, and ensuring public safety and internal security. The study was conducted in four (4) municipalities in the Province of Ilocos Norte - two (2) municipalities from the 1st District (Pagudpud and Vintar) and two (2) municipalities from the 2nd District (Nueva Era and Badoc). A total of 235 individuals served as respondents from the four groups of stakeholders namely, PNP uniformed personnel (55), citizens (128), barangay officials (40), and Civil Society Organizations (12).

The study employed a descriptive-correlation research design. Data were gathered with the use of a survey questionnaire to measure the stakeholders' level of trust and satisfaction with the performance of police officers. This was reinforced with an interview which served as a tool to validate the responses of the respondents. Findings revealed that stakeholders had high trust in the performance of police officers in Ilocos Norte, particularly along with enforcement of the law, prevention, and control of crimes, maintaining peace and order, and ensuring public safety and internal security.

The engagement of stakeholders in various police activities in the community made them aware and able to attest to the commitment of the police in performing their primary functions as law enforcers, and leaders in the prevention and control of crimes, maintenance of peace and order, and in ensuring public safety and internal security. Similarly, results also showed high satisfaction of stakeholders with the performance of police officers in Ilocos Norte, particularly in implementing laws and local ordinances related to anti-illegal drug operations such as buy-bust operations, anti-illegal gambling, and anti-illegal fishing operations.

Stakeholders are also highly satisfied with the different police activities that contributed to the prevention and control of crimes such as regular conduct of police patrol, crime prevention seminars, pulong-pulong: and barangay, house, and school visitations. The reengineering efforts of the PNP to restore public trust and respect through the Internal Cleansing Strategy raised the service quality and efficiency of police administration thus making Ilocos Norte drug-free, crime-free, and free from the presence of terrorists.

Data on the trust and satisfaction of police officers can be used by police leaders and administrators to improve the image and performance of the PNP in performing their basic function as the protector of the lives of the people. The involvement of the barangay officials, tanods, and Barangay Peacekeeping Action Team (BPAT) members - the police equivalent in the barangay level in the maintenance of peace and order, together with the PNP, is deemed effective.

ABSTRACT

MARCELINO, KAREN RAIDIS R. Mariano Marcos State University. May 2020.
CAPABILITY ENHANCEMENT PROGRAM FOR NURSE ADMISTRATORS.

Major Adviser: Artemio P. Seatriz, Ed.D.

This study developed a Capability Enhancement Program for Nurse Administrators based on the level of competence of the nurse administrators in the different schools/ colleges of Nursing in Region 1 during the school year 2018 – 2019. This study involved 11 schools/colleges of nursing Region 1 which signified their willingness to participate in the study. Thus, a total enumeration of the 11 nurse administrators was done and 82 faculty members rated their respective nurse administrators.

The descriptive study employed the Research and Development (R & D) method. The needed data were gathered using the questionnaire on the demographic and professional characteristics of nurse administrators, rating scale on the competencies of the nurse administrators along 21st century skills a, and content validation rating scale. These were administered to the nurse administrators after necessary requests and review clearances were approved.

Data gathered were analyzed using frequency counts and percentages, means and standard deviation, t-test for dependent samples, Pearson r and point-biserial. In all test of significance, the level of significance was set at .05 probability level.

Results revealed that the nurse administrators of the different schools/ colleges of Nursing in Region 1 are in their middle-aged stage, most of them are female are married.

These nurse administrators have been serving as administrators for almost ten years, possess the necessary qualifications as deans of the schools / colleges of Nursing and have attended three or more trainings/seminars.

Generally, the nurse administrators have highly satisfactory level of competence along 21st century skills like educational leadership, resolving complex problem, communication and development of self and others. Their level of competence along the 21st century skills is not significantly related to their age, sex, and civil status. Their level of competence along educational leadership and its component of setting instructional directions are significantly influenced by numbers of years as administrator educational attainment and number of trainings/seminars attended. However, their level of competency along resolving complex problems, communication and development of self and others and their specific components are not significantly related to any of the professional characteristics.

Using the results of the survey, a Capability Enhancement Program for Nurse Administrators was developed and it was validated by a panel expert along the components: objectives; strategies/activities; persons and agencies involved; time frame; budgetary requirements; and expected outcomes using a content validation rating scale.

The proposed capability Enhancement Program for Nurse Administrators is valid. Hence, it can be used to enhance the competence of the nurse administrators along the 21st century skills.

ABSTRAK

MARCELO, MILALYN R. Universidad ti Estado ti Mariano Marcos, Mayo 2020. **PANAGIBARUBASA A KAS PANANGRISUT KADAGITI LINGGUISTIKO, LITERARIO KEN ULTURAL NGA ISIU TI DANGADANG.**

Dagiti Nangidaulo: Rosabel L. Acosta, Ed.D., Aurelio S. Agcaoili, Ph.D. Daytoy a tesis ket maysa a panagsukisok kadagiti wagas ti umno gapu ta nasamay a iti panangibarubasa iti novela a Dangadang, maysa a novela a naisurat iti Tagalog ken maysa kadagiti naikkan iti pammadayaw iti Centennial Literary Prize 1998, ti sentenario ti Revolusion 1898. manipud iti texto a Tagalog agturong iti Ilokano.. Agpuligos ti diskusion iti proseso ti panangibarubasa a maiturong kadagiti literario, linguistik ken kultural nga isiu iti original ken kasano a narisut dagitoy iti barubasa. Maibasar daytoy a papel iti panangibarubasa iti uppat a pulo (40) manipud iti pitopulo ket dua (72) a bensa ti Dangadang, maysa a novela a sinurat ni Dr. Aurelio Solver Agcaoili

Ti Dangadang ti nausar kas sors a texto. Agserbinto ti barubasa a nayon dagiti novela iti Ilokano. Baeten iti panagbasa kadagiti novela iti nakaiyanakan a pagsasao, mapabileg ti panangipateg dagiti ubbing iti lengguahe ken kulturada. Uray met dagiti nataengan nga agbasbasa. Daytoy a panagadal ket nangrugi manipud iti panangibarubasa ken nagtuloy iti panangtakuat iti panangrisut kadagiti nasarakan nga isiu. Maysa a narikut ken napnuan-karit a proseso ti panagibarubasa. Daytoy ti nanglukat iti dalan manipud iti naaramid a panangibarubasa ti Tagalog agturong iti Ilokano. Mabalín nga agserbi daytoy a pagibasaran para kadagiti sabali a lengguahe ti Filipinas. Iti daytoy, paneknekan ti panangibarubasa manipud Tagalog agturong iti Ilokano a ti Ilokano ket maysa a lengguahe a kas mannakabalin ken ekspresivo kas kadagiti dadduma a nasaknap a maus-usar a lengguahe.

ABSTRACT

MARDERS, JAMES S. Mariano Marcos State University, December 2020
COMPETENCIES OF THEIR PREFERRED LEARNING AND DEVELOPMENT INTERVENTIONS (LDI).

Major Adviser: Margarita G. Hilario, DPA

This descriptive study determined the level of competencies of the administrators of Mariano Marcos Memorial Hospital & Medical Center (MMMH & MC) along with core competencies, leadership competencies, and organizational competencies. It also determined the Learning and Development Interventions (LDI) preferred by the administrators which they consider as relevant and could further enhance their leadership competencies as leaders. Further, the study determined the expected outputs from the preferred LDI as perceived by the administrators. From a total population of 81 hospital administrators of MMMH & MC (1 Medical Center chief, 4 division heads, and 76 department heads/administrators), 59 (73%) served as a sample of the study.

The competency assessment tool developed by the researcher, which was based on the Leadership Competency Framework of the Civil Service Commission (CSC) and the List of Core Qualifications and Competencies of Public Executives by Denhardt and Denhardt (2014), served as the primary instrument in gathering data on the level of competencies of the respondents. Data gathered were statistically treated using frequency counts, percentages, ranks, and means. Results revealed that the administrators of MMMH & MC possess the needed competencies of leaders and managers. They exhibit a high level of competencies along with core, leadership, and organizational competencies which are vital in performing their functions as administrators which would greatly contribute to the attainment of the vision, mission, and goals of their organization.

However, despite their being highly competent as administrators of MMMH & MC, they still prefer to have Learning Development Interventions (LDI) that could enrich if not sustain their leadership competencies as leaders. They strongly believe their participation in their preferred LDI would make them more competitive and strategic leaders, more proactive to change, and become excellent providers of public health service.

ABSTRACT

MARTINEZ, MYLA FEI QUIBUYEN. Mariano State University. May 2019.
COMPUTING OF DISTANCE- REGULAR GRAPHS AND THEIR MULTIPLICITIES .

Major Adviser: Michelle D. Reynera.

The study gave an exposition of the Section 2.5 of the paper by Edwin R. Van Dam, Jack H. Koolen and Hajime Tanaka, titled *Distance-Regular Graphs* , which was published in Electronic Journal of Combinatorics on April 15, 2016.

The study focused on the computation of eigenvalues of distance-regular graphs. Specifically, it aimed to: a) expose an alternative method in computing the eigenvalues of distance-regular graphs using intersection numbers; b) provide details on the proof of Biggs' formula which is used in determining the multiplicities of eigenvalues; c) determine the spectra of distance-regular graphs using Biggs formula ; and d) investigate some known properties of distance-regular graphs as related to their spectra.

The results of the study show that the use of the intersection matrix of a distance-regular graph and the Biggs formula provide a convenient way in determining the eigenvalues of a distance-regular graph.

ABSTRAK

MENDOZA, FREJULYN ANTALAN. Mariano Marcos State University,
Disyembre 2020. **KAGAMITANG INTERBENSIYON SA PANIMULANG
PAGBASA PARA SA IKAPITONG BAITANG**

Tagapayo: Dr. Lilybeth C. Agno, PhD.

Pangunahing layunin ng pag-aaral na ito na ilarawan ang tunay na kalagayan sa oral na pagbasa ng mga mag-aaral sa ikapitong baitang na itinuring na hindi makabasa (non-reader) ayon sa resulta ng Phil-IRI Group Screening Test noong taong panuruan 2019-2020. Ang mga datos na nakalap ay naging sanligan para makalikha ng isang kagamitang interbensiyon. Ang nabuong kagamitan ay pinaevalweyt sa mga dalubhasa upang matukoy ang validiti nito ayon sa kalidad ng nilalaman, kalidad ng kahusayan, at teknikal na kalidad. Ginamit ang palarawang pananaliksik (descriptive research) sa pag-aaral na ito. Inilarawan nito ang kalagayan ng mga mag-aaral na hindi makabasa. Sa pagbuo ng kagamitang interbensiyon, sinunod ang mga hakbang na itinakda ng pamamaraang Research and Development (R&D) -- ang pagpapalano, pagbuo, at pagbalideyt. Gamit ang purposive sampling technique, 11 na guro sa Filipino 7 ang naging tagatugon mula sa limang paaralan (5) sa Sangay ng Ilocos Norte na matatagpuan sa South Zone.

Gumawa ang mananaliksik ng isang structured interview guide para sa pangangalap ng mga datos. Ang mga impormasyon mula sa pakikipanayam ay sinuri sa pamamaraang tematik. Lumabas na ang mga mag-aaral sa ikapitong baitang na hindi makabasa ay nagpakita ng mga palatandaang mental, pisikal emosyunal at sosyal na tumutugma sa mga katangian ng isang non-reader. Ang resultang ito ay naging batayan sa pagbuo ng kagamitang interbensiyong alinsunod sa Dulog-Marungko. Tinawag na Mendobaza, ang e-material na ginamitan ng aplikasyong Articulate Storyline ay interaktiv at naglalayong ituro sa mga mag-aaral na hindi makabasa ang kamalayang ponolohiya (phonemic awareness), pagkilala sa mga titik (alphaber knowledge), palabigkasan at pagbasa ng salita (phonics and word recognition) sa Wikang Filipino. Ang dalawampung (20) orihinal na titik ng ABAKADA ang sakop ng pagtuturo, hindi kasama ang mga hiram na titik at mga ponemang suprasegmental. Tatlong guro at eksperto sa pagbasa, isang reading specialist at dalawang eksperto sa aspektong teknikal ang nag-evalweyt sa nabuong kagamitan gamit ang Evaluation Rating Sheet for Non-Print Resources na binuo ng Kagawaran ng Edukasyon. Lubos nilang sinang-ayunan na ang kagamitan ay may mataas na validiti ayon sa kalidad ng nilalaman, kalidad ng kahusayan, at teknikal na kalidad.

ABSTRACT

MEDRANO, ERICK L. Mariano Marcos State University. May 2021.
INFOGRAPHICS IN GUIDED DISCOVERY LESSONS FOR GRADE 6 SCIENCE.

Major Adviser: Dr. Cesario Y. Pacis

The study generally aimed to develop Infographics in Guided Discovery Lessons (IGDL) in Grade 6 Science. Specifically, it investigated the learning competencies in Science 6 that can be best taught using infographics as perceived by teachers. Also, it determined the effectiveness of the IGDL in improving the performance in Science among the Grade 6 learners. The study used the descriptive research design employing the Research and Development (R&D) methodology. It surveyed 162 Grade 6 Science teachers from the Schools Division of Ilocos Norte on the essential competencies in Science using Needs Assessment Survey. The developed Infographics in Guided Discovery Lessons were validated by a panel of experts and tried out to the Grade 6 pupils of San Nicolas Elementary School. A researcher-made pretest and posttest were used to determine the effectiveness of the infographics.

Results show that 14 out of 30 (46.67%) of the Grade 6 Science learning competencies were considered to be best taught using infographics as perceived by the teachers. With this result, IGDL was developed to improve the Grade 6 learners' performance in Science. The IGDL used graphics and text to achieve various instructional objectives and create a rich learning environment for both teachers and learners. The Department of Education-Learning Resource Management and Development System Evaluation Tool for Print and Poster was utilized to determine the content validity of the IGDL.

In terms of content, instructional and technical qualities, the IGDL was evaluated as valid. The over-all mean implies that developed Infographics in Guided Discovery Lessons can be utilized in the acquisition of Science concepts. Also, it is valid in improving learners' performance in Grade 6 Science. The tryout result showed that the level of performance of Grade 6 learners improved from needs improvement level to a very satisfactory level. The t-test result revealed a significant difference between the level of performance of the Grade 6 learners in their pretest and posttest mean scores. Thus, the IGDL improved the students' performance. Hence, it can be used as instructional materials in teaching concepts in Grade 6 Science.

ABSTRAK

MIGUEL, KIMBERLY S. Tesis ti Masterado. Pagadalan a Graduado iti Universidad ti Estado ti Mariano Marcos, Mayo 2020. **INDIGENO A FILOSOFIA DAGITI ILOKANO MANIPUD ITI BURTIA.**

Nangiwanwan: Rosabel L. Acosta, Ed.D., Aurelio S. Agcaoili, Ph.D.

Aramat ti deskriptivo a kualitativo a disenio ti sukisok, sangagasut a burtia ti naglasat iti textual a panaganalisar tapno: 1) maiparangarang ti indigeno a filosofia a maanninaw kadagitoy a burtia, 2) maanalisar no kasano nga intalimeng dagitoy a burtia dagitoy nga indigeno a filosofia, ken 3) maipakita ken mailawlawag no ania dagiti adal a nasken a maiyallatiw iti agdama ken iti sumaruno a generasion manipud kadagiti burtia ken indigeno a filosofia.

Nagpaay a kas kangrunaan a basar ti teoria-balabala ti Pakasaritaan: Saritaan-Sarita-Pakasaritaan ni Agcaoili (2006, 2010) ken ti ipaip ti panagmennamenna nga isingsingasing ni Alejandro (2015) iti nawaya a panagfilosopia iti Ilokano. Babaen kadagitoy, nalukaisan ti relasion ti lengguahe kas rangtay ti kultura ken literatura kenti expresivo ken komunikativo a panagisip ken panagpuotti tao tapno maimdengan dagiti padasna ken ti estilo ti panagiyebkasna. Kualitativo a deskriptivo a disenio ti sukisok ti naaramat iti daytoy a panagadal. Sangagasuta burtia ti naglasat iti panagmennamenna tapnon mapalnuad dagiti naitalimeng a filosofia ken estilistiko a ramit nga adda kadakuada Adda nalawa variasion kadagiti sungbat dagiti burtia-ayup, mula, ramit, alikamen, iti taltalon, iti kusina ken ddauna pay a paset ti pagtaengan, iti paraangan, dagiti ramit iti panagtrabaja, dagiti elemento iti nakaiparsuaan, ken dadduma pay. Ket aingitoy a kita ti sunghat, imparang dagitoy a burtia ti indigeno a filosofia tnakem, 1 pu an alpatsuaan, ken ti kararua ken nagan a nangted-turong kagag sosisionklual nea aramid u biag dagiti lokano. Pasingkedan dagitoy a filosofia tu pama okano zt akcmna kas maysa a manakman nga agente ti tunos ken urnos iti nakatpasuaakem ti multiverso a realidad ti nakaiparsuaanna.

Ramen met dagitoy a burtia iti kabukodan a version ti estilo, estetiko, ken estilistiko ait a nangbalkot kadagiti nadumaduma a pset ti indigeno a filosofia dagiti Ilokano panangitalimeng ni lokano kadagiti indigeno a filosofia ti nakem, ti panangawat itt mukauparsuaan, ken t kararua ken nagan, nusarna ti pintas ken tikaw ti 1) binana, wenno dua a sstema ti sungbat kas koma adda-awan, mayal-madi, we-saan,) analogia, cno ti panagdinnasig tu dua a banag nga aramat ti metalor ken panagpada, 3) paradoja, wenno ti panagusar sti panagkinnonta dagii Idea nga imet i pannakaumos dagiti balikas no a mabukel nga imagen wenio, kch 9) culonla wenno ti panagay-ayam kadagit aillikas baben iti asonanse ken alilerasionl panagatalnat Kac dagtt onomalopociko a balikas kes panagay-ay ars kadagti aweng hg D, a mangharut lu nivel a para ti uni ken aweng, parnakaurnos dagit bslikas, EEn 50 aaa AR Tethal a turngla Ramen pay dagiti burtia fi exagerasion weS spaanglaaw an, panagusarna iti presision

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sarsanta Iokano te dsгой pagada aa pagadawan ni Ilokano kasta metten ti naidumduma a panang na bag e aidad dagiti parsua nga adda iti aglawlawna Arkusan dag estlistia aaramt kcn kabukodan a version ti estilo ken arte dagiti burtia ni Iokano ap ap gu idea a bunga ti naubbog nga imaginasion ken nabaknang aluna bukodaa nga annayas ken kigtot, ramen ken raman, biag ken buya, ken amangspakita iti panangimdeng ni Ilokano iti nakaiparsuaanna ii kasta, dagiti adal ken filosofia a nasken nga mayallatiw it agdama ken sumaruno a generasion ket tu 1) panangtenneb ti nakem iti naimbag a sursuro tapno i a pannakalcnnbna, aglipias dagitoy a sursuro kas naimbag nga aramid, ken ti 2) panangtapben it nakaiparsuaan tapno saan a mapukaw ti buya ken pintas, ramen ken paursua, ti lubong ns Ilokano Babacn li panangtagiben iti nakaiparsuaan, malaginay on met dagit kababalin ni Iokano a pannakabunga u panangtarnpato ken panaraken t nakaiparsuaas kenkuana ken patanyaralkupna i Karn ken karnt tu kadagaan ti locos a ken kankuana.

ABSTRACT

MORELLA, JONAREX LAYUS. Mariano Marcos State University. May 2019.
MANAGERIAL SKILLS OF BASIC EDUCATION WOMEN LEADERS: BASES FOR THE FORMULATION OF A LEADERSHIP MODEL.

Major Adviser: Dr. Artemio P. Seatriz.

The study employed a descriptive survey to determine the managerial competence of basic education women leaders along conceptual, technical and human skills. Specifically, it looked into their socio-demographic profile in terms of age, educational attainment, length of service as administrator, and present administrative, position. It also dealt with the problems and challengers they encounter and how do they overcome such adversities. The study, being a process and output-based research undertaking, has resulted to the formulation of leadership model.

The needed data were gathered using the Managerial Skills Questionnaire developed by (Goodarzi, 2002). A portion of the women administrators' questionnaire was allotted to their demographic characteristics. They responded to 43 items with sub indicators in Managerial Skills Questionnaire using a five- point Likert Scale ranging from 1 (incompetent) to 5 (Very Highly Competent). The data gathered through the questionnaire were substantiated by informal interviews using a non-structures script. A content validation instrument was developed by the researchers and was used by a panel expert to determine the validity of the leadership model in terms of structure, content and usefulness.

Results revealed that the basic education women leaders in the Schools Divisions of Ilocos Norte, Laoag City, and City of Batac are of varying ages from young adulthood to middle adulthood, majority are master's degree holders almost half of them has an administrative experience within the range of 1-5 years, and they are dominated by principal I followed by Principal IV.

The basic education women leaders are very highly competent in demonstrating their managerial skills along its three domains. The most common challenges that they have encountered include gender roles, stereotyping, ageism, racial bias, and trust and ethics.

Based on the results of the survey, the 3H (Head, Hand, and Heart) Leadership Model was formulated and was evaluated by the panel of evaluators as highly valid in all the three components.

The findings have proven a premise of Katz's theory that women leaders are expected to always demonstrate their conceptual, technical, and human skills in order for them to perform their leadership roles efficiently and effectively.

ABSTRACT

NARCISO, NENETH S. Mariano Marcos State University, December 2020.
SENIOR HIGH SCHOOL STUDENTS' LEARNING STYLES AND TEACHERS
TEACHING STYLES: BASES FOR
A CONTINUING PROFESSIONAL EDUCATION PROJECT

Major Adviser: Eliza T. Samson, Ed. D.

Using the descriptive research design, this study was conducted to describe the learning styles of Grade 11 students and teachers teaching styles in the academic track as bases in the development of a Continuing Professional Education (CPE) Project in the Schools Division of Laoag City. Conducted in the different secondary public schools, the study had a total of 939 respondents from the students, 99 teachers and 15 program implementers. A survey questionnaire was used in the gathering of data and mean was utilized in the analysis of data.

Findings revealed that the most preferred learning styles of students are competitive and collaborative and both were described as high preference. Likewise, the most preferred teachers teaching styles are delegator, personal model, and formal authority which were described as high.

Considering the results of the study, a Continuing Professional Education (CPE) Project was crafted by the researcher to improve the competence of teachers in the delivery of the teaching-learning process. The said project is proposed to support and strengthen the goals of the Department of Education particularly the Schools Division of Laoag City to provide quality education among its clientele. It has the following objectives: a) enlighten the participants on the importance of knowing the teaching styles of teachers and learning styles of students to facilitate teaching - learning process, b) provide opportunities for participants to reflect on their practices that affect how students respond to instruction, c) recommend teaching strategies that will respond to the needs of diverse learners; and d) familiarize participants to reflect of a non-restrictive tool that they can use in identifying students' learning styles in their classes. Several topics were laid in the proposal to widen and advance the teachers and administrators / guidance counselors in areas related to their field of specialization. The proposed training was validated by program implements and they rated it as highly valid in terms of rationale, objectives, contents/topics, strategies, resources, time frame, budget and monitoring/evaluation strategy.

ABSTRACT

OASAN, FREDELYN CLARO. Mariano Marcos State University, May 2020. **WORK VALUES AND JOB STAISFACTION AMONG NON-TECAHING EMPLOYEES OF THE SCHOOLS DIVISION OF ILOCOS NORTE.**

The descriptive-correlational study focused on determining the work values and job satisfaction among non-teaching employees of the Department of Education, Schools Divisions of Ilocos Norte. The subjects of this research included the permanent rank and file employees from the 26 implementing units from the division office of the Schools Division of Ilocos Norte.

The sample size was determined by Slovins' Formula. The stratified sampling technique with proportional allocation was employed using schools and the division office as stratification keys. This study made use of a modified version of Donald Super's Work Values Inventory (WVI) Questionnaire and Paul E, Spector's Job Satisfaction Survey to determine the work values and job satisfaction of the non-teaching employees. Mean, frequency, count, percentage, Pearson r and point-biserial correlation were used in the statistical treatment of data.

ABSTRACT

OCAMPO, ANNA VANESSA ARGEL, Mariano Marcos State University. March 2019.
DYNAMIC LEARNING ACTIVITY GUIDE IN TEACHING ARALING PANLIPUNAN 5.

Major Adviser: Dr. Imelda L. Najorda.

This study developed a Dynamic Learning Activity Guide in Teaching Araling Panlipunan 5 based on the empirical data gathered through a survey conducted at the Department of Education, City of Laoag during the School Year 2018-2019. Specifically, the study identifies two things: the lessons in ARaling Panlipunan (AP) 5 that require dynamic learning activities (DLA) and the appropriate DLA in each lesson.

The descriptive research learning design was used in the study using the research and design methodology. The development of the learning guide underwent three stages: Planning, Development and Validation. This is based on the dynamic theory of learning.

A survey questionnaire and modified content validation rating scale were the research instruments used for data gathering. The questionnaire consisted of two parts. The first part is the list of 15 lessons in AP 5 where respondents identified the lessons or topics that dynamic learning activity can be related to. The second part is a list of dynamic learning activity that can be appropriate to teach the lessons. The content validation rating scale was used in determining the validity of the prepared teaching guide.

These were the bases in developing a Dynamic Learning Activity guide in Teaching Araling Panlipunan 5. It is forwarded by the study that teachers teaching the subject may use the said Guide to cultivate mastery of competencies required by Araling Panlipunan (AP) framework in the K to 12 curriculum and for the advancement of the 21st century skills.

The result of the content validation revealed that the Dynamic Learning Activity Guide in Teaching Araling Panlipunan 5 is very highly valid in terms of lesson objectives, content, activities and assessment technique, hence, Department of Education may use it to attain the K to 12 Basic Education goals.

ABSTRACT

PADIOS, FELICAR AMISTAD. Mariano Marcos State University, May 2020.
CULTURE-BASED LEARNING MATERIAL TO NURTURE THE SOFT SKILLS ON 21ST CENTURY LEARNERS.

Major Adviser: Prof. Carloyn G. Paguyo.

This research study developed a culture-based learning material to nurture the soft skills of 21st century learners in the subject Araling Panlipunan 10 (Contemporary Issues) The research and development (R&D) Methodology was utilized in this study. Purposive sampling was used in selecting the respondents consisted of school heads in the Schools Division of Ilocos Sur and Human Resource Managers in Ilocos Sur who are involved in the business of traditional Ilocano culture-based products.

The research used three research instruments to the research problems under investigation: a checklist, an unstructured interview guide and a content validation scale to gather the needed data. The study used descriptive statistics that includes frequency, percentage, and ranking to interpret the soft skills and weighted mean in determining the validity of the learning material as to its learning outcomes, content, instructional quality and values formation.

Significant findings of the study showed that being hardworking, committed, passionate, patient, self-confident, compassionate, punctual, respectful, industrious and resourceful are considered most important soft skills according to the school heads. For the human resource managers, being hardworking, industrious, patient, self-confident, respectful, punctual, honest, responsible, passionate and hospitable and their preferred soft skills that their employees need to possess.

The result of the survey and interview with key informants and stakeholders became the bases for the development of the culture-based learning material. This learning material is designed to aid the teacher in nurturing the soft skills of 21st century learners which employers expect from their employees. It is documentary video clip of five selected traditional industries accompanied by an instructional design that emphasizes the development of soft skills which are important for lifelong learning. Moreover, the culture-based learning material was content validated by a panel expert in terms of objectives, content, values formation, technical qualities and instructional qualities.

With an overall mean of 4.95, the developed culture-based learning material was rated excellent by the validators. The culture-based learning material is therefore valid, hence can be used as supplementary learning material in teaching Araling Panlipunan 10. Furthermore, the culture-based learning material (CBLM) is very useful in the preservation and appreciation of local Ilocano industries as part of the rich cultural heritage of the Ilocanos. Therefore, it can be used as supplementary material in teaching Contemporary Issues in Grade 10.

ABSTRACT

PAGAT, PEARLIE MAE Y. Mariano Marcos State University May 2021
**IMPLEMENTATION STATUS OF THE STRENGTHENED TECHNICAL
VOCATIONAL EDUCATION PROGRAM (STVEP) - FOOD TRADES IN THE
PUBLIC JUNIOR HIGH SCHOOLS IN ILOCOS NORTE.**
Major Adviser: Zaldy A. Fernandez, MAEd

This descriptive study was conducted to determine the implementation status of the Strengthened Technical Vocational Education Program (STVEP) - Food Trades in the public junior high schools in Ilocos Norte as described by the Food Trades teachers student competencies; development support to along the following components: teachers, instructional qualities, teacher's welfare, benefits, incentives, recognition and awards, instructional materials, laboratories, tools and equipment; monitoring and Based on the results of the survey, the evaluation; and administrative support. strengths and weaknesses of the program were identified and used as the bases for the formulation of a plan of action to address the weaknesses and enhance the implementation of the program Data were gathered mainly through a survey - questionnaire which was designed in accordance with the STVEP - Food Trades guidelines. Before it was put in its final form, the survey - questionnaire was first subjected to the scrutiny of the members of the research panel and experts in Food Trades Education for their comments and suggestions. After it was finalized, it was then were administered to the STVEP - Food Trades teachers in the three public junior high schools in Ilocos Norte which presently implement the aid curriculum, namely: Burgos Agro - Industrial School (BAIS), Ilocos Norte Agricultural College (INAC) and Ilocos Norte College of Arts and Trades (INCAT) during the school year 2019-2020,

Data were analyzed using the mean and were interpreted using the appropriate descriptive interpretation for the different components of the program that were assessed and evaluated. Results revealed that the STVEP - Food Trades guidelines or set standards are attained at a moderately observed level in Ilocos Norte. The contents of the curriculum are relevant to the needs of the students in the community. STVEP - Food Trades teachers are qualified, competent and experts in teaching the program. However, the instructional materials, laboratories, tools and equipment and monitoring and evaluation components still needs to be improved or enhanced. Improvements should not only be limited to the identified weak components but also to the identified strengths to ensure that all the standards set by the experts are met and satisfied, and to sustain the smooth and effective implementation of the program. This will ensure that the interest of all stakeholders will be protected and the goals and objectives of the program will be attained.

Hence, it was recommended that STVEP - Food Trade teachers in Ilocos Norte must continue to strive to develop knowledge, skills, values and attitudes in the learners which will help prepare them for the world of work. It is for this reason that a five-

year action plan was formulated and proposed to make Philippine education relevant to the national development goals and enhance the program for the attainment of goals and objectives in particular toward excellence in education.

ABSTRACT

PALACPAC, GRETCHEN PEPSI A. Mariano Marcos State University, May 2020. IMPLEMENTATION OF THE FACULTY AND STAFF DEVELOPMENT PROGRAM OF THE UNIVERSITY OF NORTHERN PHILIPPINES.

Major Adviser: Margarita G. Hilario, D.P.A

This study was conducted to assess the implementation of the Faculty and Staff Development Program of the University of Northern Philippines in terms of the attainment of objectives, adequacy of resources, provision of benefits and adherence to policies and guidelines based from the responses of the grantees and implementers using questionnaires as the main data gathering instrument. The items used in the questionnaire are taken from the UNP University Code 2010 and Amended Guidelines in the implementation of the Faculty and Staff Development Program. It is also determined the significant difference between the responses of the granted and of the implementers; and the challenges encountered by the grantees and implementers.

Respondents of the study were FSDP grantees (70) and implementers (26). Results have shown that the implementation of the FSD program in terms of the attainment of objectives, provision of benefits and adhere to policies described as very high. In term of adequacy of resources has a significant difference at 0.05 probability level.

On the other hand, bot grantees and implementers encountered challenges in the implementation of the program in terms of its objectives, resources, benefits and policies. For the grantees, difficulty in completing the degree on time, lack of orientation on FSD Programs' policies and guidelines, no contract of agreement between the administration and grantees, inadequate and delay in the disbursement of financial assistance emerged as the challenges in the pursuit of professional development. In addition, the absence of signed contract of agreement between the grantees and implementers, difficulty in monitoring and evaluating the status of grantees, and enforcement of policies of the said program were also found as challenges for implementers.

These results recommend that the University of Northern Philippines should maintain the FSD Program as one way of enhancing the capabilities of its faculty and staff. Furthermore, the university may consider amending the said program to address the challenges by the grantees and implementers.

ABSTRACT

PASCUA, JOHN WEL B. Mariano Marcos State University. May 2020. **LOCAL COMPETITIVENESS AND INVESTMENT CLIMATE IN THE MUNICIPALITY OF BADOC, ILOCOS NORTE.**

Major adviser: Orlino J. Mandac,MAPA

The study was conducted to describe the competitiveness and investment climate of the municipality of Badoc, Province of Ilocos Norte. The assessment of the competitiveness and investment climate through this study can be used in the municipality as basis for local development planning and as a guide in determining policies that support private domestic investments, develop innovative policies and programs towards a competitive environment and sound investment climate. Badoc is a third-class municipality in the Province of Ilocos Norte.

The study employed the descriptive research design. Business owners who have been in business for at least two years and with a capitalization of at least PHP 250,000.00 were the population of the study. Of the total population, fifty-five (55) were selected using purposive sampling and were classified according to type of business. Proportional allocation was used to determine the number of participants from each business type.

Data gathering was undertaken through a questionnaire, a part of which was patterned after the 2005 World Bank's version of investment climate survey questionnaire for the investment climate, and the second part which was adopted from the Department of Trade and Industry's Cities and Municipalities Competitiveness Index 2019 for the local competitiveness. Informal interviews were also conducted to elicit problems encountered and the factors perceived to motivate people to invest.

Findings reveal that majority of the investments in the municipality were commercial business. Most of the business establishments were registered as sole proprietorship, have been operation for 7 years or less, employed 1-5 workers and have a capitalization of less than 3 million pesos.

Results also showed that the municipality of Badoc is competitive locality when it comes to the four major indicators of local competitiveness, such as economic dynamism, government efficiency, infrastructure and resiliency. Respondents describe the over-all investment climate factor as an opportunity. Investment climate in the municipality was deemed favorable with minimal risk to investors/businessmen. The factors perceived to promote investment were macroeconomic fundamentals, governance and institutions and infrastructure.

Proximately to customers, availability of land and labor cost were important motivational factors that have encouraged businessmen to locate their business in the municipality. Most of them encountered problems on high tax rates imposed by the government.

ABSTRACT

PASCUA, ROMMEL Q. Mariano Marcos State University. May 2021.
REPRODUCTION AND DEVELOPMENT OF *Porphyra* spp. IN NORTHWESTERN ILOCOS, PHILIPPINES.

Major Adviser: Prof. Andres Y. Tungpalan, MSc

In this archipelago of 7,641 islands, individuals' lifestyle is firmly associated with the ocean. The country's exceptionally useful fisheries, when managed economically, can take care of the developing Philippine populace and accomplish financial development and security. Since the Philippines uphold a quickly expanding populace dependent on marine assets, the reasonable administration of our fisheries ought to be the fundamental exploration plan. It is about time, to search for other seaweed-based business endeavors which could be an alternative and as food to supply the protein needs of the Filipinos. This study gives fundamental and critical data in support of the creation of *Porphyra* species evaluation in support of both financial development and environmental prosperity particularly to those Ilocano fisherfolk who have been engaged with the gamet business throughout the years in Northwestern Luzon, particularly in Burgos, and Pagudpud. *Porphyra* species exhibited a normal bi-phasic life history that alternates with sporophytic conchocelis and gametophytic blades in culture. *Porphyra* species reproduce through both sexual and asexual methods of reproduction. Among the three (3) *Porphyra* species in Northwestern Ilocos, *P. suborbiculata* developed a lot the quickest. Modified Grund Medium, seawater-enriched, and pure seawater are possible for conchocelis culture. The initial two are the most preferred culture media, and capiz shell is the most favored substrate for spores, for they advance the best development and improvement in *Porphyra* species.

ABSTRAK

PASCUAL, PATRICIA HAPA. Maricao Marcos State Univeristy, Disyembre 2018.
LEARNING MODULE SA PAGTUTRO NG FILIPINO 7.

Tagapayo: Dr. Maria Eliza S. Lopez.

Pangunahing layunin ng pag-aaral na ito na makabuo ng learning module sa pagtuturo ng Filipino 7 gamit ang paglalarawang pananaliksik (descriptive design).

Gamit ng universal sampling technique, labinlimang (15) guro sa Filipino sa ikapitong baitang na mula sa paaralang sekondarya ng Lungsod Laoag ang naging respondent sa isinasagawang sarbey tungkol sa kasanayang pampagkatuto na mabisang maituturo sa pamamagitan ng mga gawain at mga pagsasanay.

Gumamit ng tseklist upang matukoy ang mga kasanayang pampagkatuto na maaring gawan ng mga pagsasanay o gawain para sa pagbuo ng learning module salig sa Teoryang Cognitive Load.

Anim (6) na eksperto ang nagsilbing ebalweytor ng binuong learning module. Batay sa mga pagsusuri, puna, at markang ibinigay ng mga gurong ebalweytor hinggil sa baliditi ng mga nailalaman , wika at gramatika, at porma , lumabas sa pag-aaral na angkop gamitin ang learning module sa pagtuturo ng Filipino 7 na ipinapakita ng overall composite mean rating na very high valid (4.87) mula sa composite mean ng nilalaman (4.89), wika at gramatika 94.94), at porma (4.77).

ABSTRACT

PASCUAL, PILAR CAROLYN V. Mariano Marcos State University. May 2019. **PHYTOCHEMICAL SCREENING AND BIOACTIVITY OF *Carpopeltis flabellata*. Halymeniaceae (Okamura, 1935) COLLECTED IN ILOCOS NORTE, PHILIPPINES.**

Major Adviser: Andres Y. Tungpalan, MS Biology

Seaweeds have been consumed by coastal communities especially in Asian countries for their ethnobotanical use. Many marine algae were proven to have different secondary metabolites which makes them a natural source of bioactive compounds used in nutraceutical and pharmacological industries. However, there are only a few culturable seaweeds, thus, this study used the underutilized, non-food red algae *Carpopeltis flabellata* in Ilocos Norte. The *C. flabellata* extract was investigated for its phytochemical constituents and biological activity both in-vitro and in-vivo.

Initial phytochemical analysis of *C. flabellata* reveals that extract derived contains bioactive compounds such as alkaloids, saponins, tannins, phenolics, steroids, sterols and terpenoids.

The toxic activity of the ethanolic extract was tested against *Artemia salina* nauplii. Different concentrations of the *C. flabellata* extract was used in the lethal test for brine shrimp. Mortality rate of the brine shrimp increases as the extract concentration increases. The median lethal dose (LD₅₀) of the extract was at 1.5% concentration. In-vitro antioxidant activity of the ethanolic extract is determined by evaluating the total phenolic content (TPC), DPPH assay and total antioxidant (TAC). *C. flabellata* extract showed high radical scavenging activity which makes it a potential natural source of antioxidants. This is supported by its high TPC (05.03 µg gallic acid/mg dry sample) and TAC (22.73 µg/ml).

In-vivo antioxidant and hepatoprotective potential of the *C. flabellata* extract was also evaluated. The ethanolic extract was tested against acetaminophen-induced mice and was compared to silymarin treated mice as positive control. The lipid profile (cholesterol and triglyceride) and serum transaminase (AST and ALT) was measured in mice serum.

Results revealed that the extract exhibit significant reduction in the cholesterol and triglycerides levels in the mice serum. Likewise, the extract also showed significant effect in lowering AST and ALT levels. The hepatoprotective activity of the extract also showed remarkable results as there are only mild histological changes in the acetaminophen-induced mice treated with *C. flabellata* ethanolic extract. The results obtained indicate that *Carpopeltis flabellata* contains phytochemical compounds which possessed toxic, antioxidant, anticholesterimic and hepatoprotective properties.

ABSTRACT

PATUBO, RODELYN S. Mariano Marcos State University. May 2020. **GAMIFIED APPROACH IN TEACHING LIFE SCIENCES: ITS EFFECT ON STUDENTS' ENAGGEMENT AND PERFORMANCE**

Major Adviser: Eva B. Macugay, Ph.D.

The study determined the effects of gamified approach in teaching the cell on students' individual and collaborative engagement and performance. The study used a quasi-experimental design using intact classes among 70 Grade 12 Senior High School Students of the First Semester, Academic Year 2019-2020, who are taking up Academic Track – Science, Technology, Engineering and Mathematics (STEM) Strand in one of the private schools in Laoag City. AN ICT-based game title “Cell Voyage” was used through the gamified approach to the experimental group while the intended curriculum was used for the control group.

The findings revealed that the experimental group obtained higher scores during the post-assessment of their individual and collaborative engagement and posttest, which show that the experimental group became more individually and collaboratively engaged, and performed better after having been exposed to the gamified approach. Moreover, the pre-assessment and post-assessment scores of the control group along individual and collaborative engagement has no significant difference, also with their pretest and posttest score, which indicate that the intended curriculum did not remarkably improve the individual and collaborative engagement and performance of the students.

Further, the results proved that there is a strong correlation between students' engagement and performance, that is, if the level engagement is higher, the students tend to have higher level of performance. Hence, the study concludes that the gamified approach is effective in enhancing the individual and collaborative engagement of students which rebounds to an improved performance.

ABSTRACT

PAZ, PENELOPE A. Mariano Marcos State University, May 2019. **ASSESSMENT OF POST-STROKE PATIENTS' QUALITY OF LIFE BASIS FOR AN ACTION PLAN.**

Major Adviser: Dr. Federico A. Nagtalon

The study looked into the quality of life of stroke patients along the physical, emotional, mental social, and spiritual dimensions using descriptive-qualitative method employing the hermeneutic phenomenological approach and came up with an action plan using descriptive quantitative method.

Key informants were purposely chosen based on some inclusion criteria and ethical considerations.

Interview during home visit was carried out guided by a set of initial questions for each dimension that served as springboard for more in-depth interview. Supplemental questions were asked in relation to the disclosures of the key informants. The proceedings of the interview were electronically recorded and transcribed. Printed transcriptions were produced as bases for coding, analyses and interpretations.

Results revealed that generally, the quality of life of stroke patient is relatively poor since an effect on one dimension could have a spiraling effect on the other. Further, though impact is unobtrusive and minimal, they are constrained by their caregivers to engage in activities within and outside the home with the fear of being exposed to physical and environmental stresses that may aggravate their condition and results to another attack. Apparently, only the physical aspect is the main focus while the different dimensions are neglected in the rehabilitation of patients at home.

The results of the study have implications particularly on the management and operations of neurovascular units of hospitals, the duties and responsibilities of attending physicians, nursing care, involvement of family members in the care and rehabilitation of patients, and the community level health promotion.

An action plan was developed that would serve as springboard to the development of collaborative framework involving medical authorities, health education institutions and community level agencies. The said action plan was validated by a panel of experts was found to be very highly valid based on the results of content validity tool.

ABSTRACT

PERDIDO, RALPH CASPE. Mariano Marcos State University, December 2020 **OUR-Repo: DEVELOPMENT AND IMPLEMENTATION OF AN ELECTRONIC REPOSITORY OF DOCUMENTS FOR MARIANO MARCOS STATE UNIVERSITY - OFFICE OF THE UNIVERSITY REGISTRAR.**

Major Adviser: Wilben Christie R. Pagtaconan, MSIT

Office of the University Registrar, the Mariano Marcos State University (MMSU-OUR) is in-charge of keeping the records of all the individuals both the students and graduates who had been enrolled in the University. Based from the result of the interviews conducted with the MMSU - OUR's personnel, the number of enrolled and graduates increase annually, hence, record keeping also increases. The National Archive of the Philippines Act of 2007 (R.A. 9470) promulgated guidelines to maintain student's scholastic records at the MMSU - OUR. The development and implementation of the system, OUR Repo, was based on the need of the said unit and ensures that it is in conformity with legal bases especially the Data Privacy Act of 2012 (R.A. 10173).

The OUR Repo serves as the repository of student records and other relevant documents of the personnel at the OUR. The personnel in-charge will scan the pertinent documents being maintained and stores such in the OUR Repo. The OUR Repo will ensure proper security of the uploaded student records and the like and a backup mechanism was included to facilitate the possible loss data loss. There are three modules included: Access Folders, Manage Users and Student Infos, and Manage Account. The Access Folders module have the following submodules: TORS, Student Records, Shared Files, and My Documents.

The Access Folder is used to organize the uploaded files. TheTORS and Student Records are intended for the storage of students' files only. The users can upload files with a maximum file size of 6 MB and must be on an image or pdf file type. The Shared Files and My Documents modules are intended for personal file storage and with a limitation of 6 MB file size and.dll, .exe, and ini file extensions the OUR Repo was conducted using the Rapid Application The development Methodology that is dimed, relevant, and timely with the current situation of the MMSU - OUR and relevant for the development of the system. The User Acceptance Test was done to comply with the software standards stated from the ISO 9126 or the Software Quality Standard. A pilot testing was administered and the personnel involved recommended that additional modules must be included to further utilize the system's functionalities.

ABSTRACT

BRYAN S. PUNGTILAN. Mariano Marcos State University, December 2020
**RESPONSE OF OFF-SEASON GREEN GARLIC (*Allium sativum* L.) TO
DIFFERENT PLANT GROWTH PROMOTERS UNDER SAN FERNANDO AND
SAN MANUEL SOIL SERIES.**

Major Adviser: Dr. Artemio B. Alcoy.

The experiment was conducted in Barangay Tabug, City of Batac, Ilocos Norte and Barangay San Roque, Paoay, Ilocos Norte during the dry season 2020 which aimed to evaluate the performance of registered garlic varieties and cultivar as affected by different plant growth promoters under San Fernando and San Manuel soil series for green garlic production in terms of growth and yield performance. The study was conducted to determine the growth and yield performance of different garlic varieties and cultivar as green garlic under San Fernando and San Manuel soil series, to find out the best plant growth promoter (PGP) that will enhance the green garlic production under San Fernando and San Manuel soil series, to know the interaction between the green garlic varieties and cultivar and plant growth promoters under San Fernando and San Manuel soil series, to identify between San Fernando and San Manuel soil series is more suitable for green garlic production, to determine the phytochemical effects of plant growth promoters to green garlic varieties and to ascertain the cost and return analysis of the green garlic varieties and cultivar applied with different plant growth promoters under San Fernando and San Manuel soil series.

Two soil series (San Fernando and San Manuel soil series), three plant growth promoters (Carrageenan PGP, Ako'y Magsasakang Organiko Plant Growth Enhancer, and Winwinzone Black Gold Soil Conditioner and a control (no application), and four varieties (Ilocos White, Mexican, Miracle and Ilocos Pink) and cultivar (Batanes White) served as the treatments. These were laid out in a Split-split plot design with three replications and a unit plot size of 5 m

Results of the study revealed that the San Manuel soil series was more suitable in green garlic production compared to the San Fernando soil series as it produced taller, larger stem diameter and bulbs, a greater number and broader leaves, and heavier plants. Sufficient evidence also revealed that the use of Carrageenan Plant Growth Promoter (CPGP) enhances the growth and increases the yield of green garlic plants. Furthermore, the use of Ilocos Pink variety and Batanes White cultivar performed better than the check variety Ilocos White in terms of agronomic and yield performance. The combination of Batanes White applied with CPGP obtained the highest ROI of 154% in the San Fernando soil series, while Ilocos Pink applied with CPGP obtained the highest ROI of 269% in the San Manuel soil series.

The effect of plant growth promoters on the phytochemical components of green

garlic varieties varied. The application of PGPs retained the presence of phytochemicals in Ilocos White but removed its presence to Mexican, Ilocos Pink, and Miracle.

ABSTRACT

PUNGTILAN, JAMIEFEL P., Mariano Marcos State University. May 2020. TECHNOLOGICAL PEDAGOGICAL CONTENT KNOWLEDGE (TPACK) AND PERFORMANCE OF MATHEMATICS TEACHERS IN THE PUBLIC SENIOR HIGH SCHOOLS.

Major Adviser: Dr. Estrella R. Pacis

This descriptive-correlational research was conducted to determine and describe the relationship of the Mathematics teachers' level of knowledge along TPACK and their level of performance as assessed by them and as observed by their immediate heads. It included 85 Mathematics teachers from the public senior high schools in the Schools Divisions of Ilocos Norte, Laoag City and City of Batac.

The teachers' socio-demographic profile and level of knowledge along TPACK were determined using the Technological Pedagogical Content Knowledge (TPACK) Questionnaire. The SAT-RPMS Tool was used to measure the teachers' level of performance as assessed by them while the COT-RPMS Tool measured the observed level of performance by their immediate heads. Mean and standard deviation were used to determine the teachers' level of knowledge along TPACK and their level of performance. Frequency, percentage, mean and standard deviation were used to analyze their socio-demographic profile.

Meanwhile, the Pearson's (r) moment of correlation was used to determine the relationship between the teachers' level of knowledge and their level of performance; their socio-demographic profile along age, educational attainment, and total number of years of teaching to their level of knowledge and to their level of performance.

On the other hand, the point biserial correlation was used to see the relationship of their sex, ICT tools used in the classroom and ICT-related trainings or seminars attended to their level of knowledge and to their level of performance.

Further, the researcher used the Chi-square test of difference to test whether the teachers' level of performance as assessed by them and as observed by their immediate head are significantly different.

Results show that the teachers have high level of knowledge in terms of content, pedagogy, technology, and technological pedagogical content knowledge. They also have a high level of performance as assessed by them and as observed by their immediate heads. The levels of self-assessed and observed performances of the teachers are not significantly different. It was also found that their attendance to Basic Computer Literacy training is significantly related to their CK, PK and TK. The use of laptops and mobile phones have significant relationships with their TK. Moreover, the use of LCD projector is found to be significantly related to their PK, while the use of VCD/DVD player and printer have significant relationship to their TPACK. Meanwhile, their

educational attainment and use of VCD/DVD player are significantly related to observed level of performance, while their utilization of ICT tools such as television and smartboard has significant relationships with their self-assessed level of performance.

Findings also show that the teachers' level of performance as assessed by them is significantly related to their CK, TK, PK, and TPACK. Results of the study confirm that performance is an indicator of their level of TPACK and their level of TPACK can be gauged by mean

ABSTRACT

QUIAPO, CHRISTINE B. Mariano Marcos State University. May 2021.
BLACK GARLIC-ENRICHED KROPEK: ALTERNATIVE TO LESS-

Major Adviser: Ruben J. Dabalos, M.T.E.

NUTRITIOUS FOODS IN CANTEENS OF PUBLIC SECONDARY SCHOOLS.
The inevitable craze of children and young adolescents to junk food (Gopal, et al., 2012 and Ashakiran, 2012) and the fact that crackers have a global impact on nutrition and the variations of this products are well accepted (Cheow, 2004), the researcher believes that the development of acceptable fortified kropek of high nutritional quality can be an alternative to high-calorie, low-nutritional value, and ready-to-eat foods. Hence, this research aims to propose a fortified kropek that can be an alternative to less-nutritious foods in canteens of public secondary schools.

The study used a descriptive design utilizing the research and development methodology and followed social cognitive theory anchored on health nutrition behavior paradigm. The very reason for utilizing this methodology is to further determine problems encountered by teachers managing canteens in selling food items to students and developed fortified kropek that can be an alternative to less nutritious foods.

It was found in this study that with the implementation of the DepEd Order No. 13, series of 2017, teachers managing canteens faced problems in selling food items that are included in the guidelines to students. The Technology and Livelihood Education (TLE) teachers claimed that students preferred junk foods over native delicacies or common Filipino snacks. They go out to buy or bring junk foods despite the strict advice of the school to parents and students. It was also found in this study that teachers managing canteens have limited time to prepare nutritious foods as per guidelines hence, administrators let contractors sell food items inside the school and also allow students sell their laboratory outputs. The TLE teachers suggested different agricultural crops that could be utilized in the processing of snack items. One suggestion was the used of black garlic, which is an emerging functional foods in the market, hence the utilization of this crop in the development of fortified kropek was considered.

Result showed that the developed experimental samples were tested negative from microbial pathogens as observed by the Molecular Microbiology and Biotechnology Laboratory of the Mariano Marcos State University - College of Arts

and Sciences. This was done prior to the conduct of sensory and acceptability evaluation.

Results of the sensory and acceptability evaluation of the developed black garlic-enriched kropek showed that kropek with two (2) tablespoon of black garlic was the most acceptable among the trained panelist. More so, results further showed that the addition of varied amount of black garlic in the preparation of kropek gives a significant difference on the appearance and flavor but not on the texture and acceptability.

Further, results of the nutrient analysis of the most acceptable products indicates that developed products could contribute in satisfying the recommended daily allowance of the basic nutrients needed by humans for healthy living as tested by the Regional Standards and Testing Laboratory of the Department of Science and Technology. Hence, it has been concluded that the developed kropek fortified with black garlic could be an alternative to less-nutritious food products in canteens of public secondary schools.

ABSTRACT

RIGONAN, WYNE MARC G. Mariano Marcos State University. February 2019.
GROWTH AND FIELD PERFORMANCE OF CORN (*Zea Maize*) var. PURPLE SWEET UNDER VARYING POPULATION DENSITY APPLIED WITH NEEM TREE LEAF EXTRACT.

This study was conducted in Barangay 16 Quiling Sur, City of Batac, Ilocos Norte from February – May 2018 to determine the response of corn var. purple sweet to varying population density applied with neem tree leaf extract (NTLE) in terms of its growth and yield. Specifically, it aimed to determine the effect of different plant population densities on the growth and yield of purple sweet corn, to find out the effect of NTLE as bioinsecticide on the control of sweet corn pest to significantly reduce the application of chemical pesticide, and to ascertain the cost and return analysis of purple sweet corn on varying population density applied with NTLE.

Result of the study revealed that plants applied with chemical pesticides produced highest ear yield 928,267 pcs.) per hectare but comparable to others treatments. However, the treatment NTLE-P3 produce more marketable ears resulting to higher net income per hectare despite of higher production cost. This means that neem tree leaf extract (NTLE) can be substitute to commercial insecticide either applied at once or twice because they obtained a comparable yield. Hence, it is more economical and environment friendly.

ABSTRACT

RIVERA, MAY FLOR C. Mariano Marcos State University, May 2019. **MATHEMATICS WORKBOOK IN ILOKANO FRO GRADE TWO.**

Major Adviser: Prof. Irene T. Acuña.

Using the descriptive research design employing the R and D methodology, this study aimed to develop Grade Two Mathematics Workbook in Ilokano in the k to 12 curriculum particularly for Grade Two. It identified the learning competencies in grade two Mathematics which could be best developed through the use of workbook as perceived by the grade two public school teachers of the City Schools Division of Batac (CSDB), and determined the content validity of the Mathematics Workbook in terms of objectives, content, materials , and equipment, activities and strategies, assessment method/ measures, and instructional characteristics.

The major steps in R and D cycle followed by the researcher in preparing the workbooks are the following: Planning Stage, Development Stage, a and Validation Stage.

Data were gathered using two data gathering instruments namely: Needs-assessment Rating Scale to determine the learning competencies on measurement that need preparation of the Ilokano workbook and Content validation rating Scale in determining the content validity of the Mathematics Workbook in Ilokano for Grade Two.

The gathered data were analyzed with the use of mean. Reveal that all the learning competencies stated in the needs-assessment survey were rated as *Very Much Needed (VMN)* and are believed to be necessary in preparing a Mathematics workbook in Ilokano.

Results also revealed that the developed Mathematics Workbook In Ilokano for Grade Two obtained a rating of *Very High Satisfactory / Very Highly Valid (VHS/VHV)* in terms of objectives, content activities and strategies, materials and equipment, assessment methods/ measures and instructional characteristics from the panel experts. This implies that the workbook is now ready to be utilized by grade two learners, particularly in competencies along Unit: IV: Measurement in the k to 12 Curriculum.

ABSTRACT

RUIZ, GRACE CLARO. Mariano Marcos State University. May 2020. Teachers' **LEVEL OF KNOWLEDGE, SKILLS, EXTENT OF USE, PERSPECTIVES AND CONCERNS ABOUT GAME-BASED LEARNING PLATFORMS (GBLP) IN THE TEACHING AND LEARNING PHYSICS.**

Major Adviser: Dr. Vida Antonio.

This study determined and analyzed the Physics teachers' level of knowledge, skills, extent of use, perspectives and concerns about game-based learning platforms (GBLP) in the teaching and learning Physics employing the descriptive-correlational research design. The one hundred fifty-three Physics teachers who were randomly chosen from the public secondary schools of the Schools Division of Ilocos Norte, Laoag City and Batac City were the participants of this study.

Two instruments were used to gather the data namely, the researcher-made Survey on Teachers' use of an Innovation Questionnaire (STUIQ) and a Structured interview Protocol (SIP). Frequency counts, percentages, means and Pearson r and point-biserial correlation were employed to analyze the gathered data.

Results of this study reveal majority of the teachers are females, relatively young age, BSEd/BS graduates with MAEd/MS units and new in the teaching profession. On both levels knowledge and skills in using GBLP in teaching in the five game based learning platforms, the overall favorable response of the teachers is at the average level. In terms of utilization, teachers observe of implement game-based learning platforms in teaching Physics once a week. The teachers generally perceived and agree that Game-based Learning Platforms (GBLP) are effective in teaching Physics and students learning.

Furthermore, the correlation test show that the teachers' socio-demographic characteristics are not significantly associated with the teachers level of knowledge, skills and extent of use GBLP as a tool in the teaching and learning Physics.

ABSTRACT

SAGSAGAT, KARIZMA JOY A. Mariano Marcos State University. July 2020, PATHOGEN SCREENING OF DOST-ASSISTED CHICHACORN PRODUCED IN ILOCOS SUR.

Major Adviser: Prima Fe R. Franco, Ph.D.

The study titled Pathogen of DOST – Assited Chichacorn Produced in Ilocos Sur generally aimed to screen pathogenic microorganisms in DOST-assisted chicacorn produced by two manufacturers in Ilocos Sur. In the study conducted, two chichacorn products were used as samples of the study. The researcher screened for microbial pathogens following the process flow detection. Process flow detection includes the collection samples from different stages of preparation and testing them. Moreover, microbial load assessment was done using the aerobic plate count monitoring. The researcher also determined the water activity of the samples to countercheck and verify the result of the standard method of testing foodborne pathogens. The study was done at the Molecular and Biotechnology Laboratory, College of Arts and Science, Mariano Marcos State University, Batac City, Ilocos Norte from February- March 2020.

The two DOST-assisted manufacturers of Chichacorn in Ilocos Sur identified in the study were at Vigan City and Candon City. The determined water activity of the samples from different stages of production did not support yet microbial proliferation in any two chichacorn produced. Microbial load assessment load assessment revealed that the two DOST- assisted chicacorn harbor microorganism.

The result showed that *Escherichia coli*, *Listeria monocytogenes*, and *Salmonella sp* were present in the raw materials before cooking in manufacturer A. However, after cooking and packaging the detected pathogenic microorganisms were already eliminated.

On the other hand, in manufacturer B. before cooking, *Escherichia coli*, *Listeria monocytogenes*, and *Salmonella sp* and *Staphylococcus aureus* were present in the raw materials: however, a fter cooking and packing, *Listeria monocytogenes*, and *Salmonella sp* and *Staphylococcus aureus* are still detected. Furthermore, *Pseudomonas aeruginosa* and molds were not dtected in any stage of the production in the two DOST – assited chichacorn produces in Ilocos Sur.

ABSTRACT

SALVIEJO, RIC L. Mariano Marcos State University. May 2020. **DESIGN AND EVALUATION OF A SOLAR ENERGY POWERED CHICKEN HATCHERY DEVICE.**

Major Adviser: Arnold F. Dumaoal, Sr., Ph.D.

In small poultry, most concerned is to eliminate the use of electricity in all production and operation activities especially during chicken hatchery period.

The study was conducted to design a solar energy powered chicken hatchery device and evaluate the performance of the device in terms of efficiency (%). It was conducted at Brgy. 16. 9Payas), San Marcos, San Nicolas, Ilocos Norte last December 26, 2019 to March 11,2020. The incubation period was 21 days and egg turning was done three times a day.

The device function composed of the mechanism system, a digital thermostat, electronic fan (e-fan), heating element (monitoring or primary and secondary bulb) air circulating tube, ventilation, humidity, and egg turning (swinging). The power source of this is, is the solar power which composed of PV Module, Battery Charger Controller, 12 Volt Lead Battery, Inverter and Extension Cord.

The device was to produce the required or steady hatching temperature. The hatching temperature was set to 37.5 °C in the digital thermostat and fluctuated in 37.4 °C, 37.5 °C and 37.6 °C. The heating element (monitoring or primary and secondary bulb) were automatically switched-on 37.4 °C and switched-off 37.6 °C. The electronic fan (e-fan) served as the blower so that the heat-air inside was equally distributed and circulated in the air circulating pipe. The purpose of device holes was for ventilation and the plastic bottle with water inside was for the humidity. The swinging angle device was used for egg turning.

The hatching efficiency was computed in each part of the egg tray in the left side (TL), middle (TM) and right side (TR). The hatching efficiency per treatment, TL, TM and TR is (94.47, 97.23 and 94.47). They were almost the same because the hatching temperature was maintained and distributed equally. The overall hatching efficiency was determined of which the first and second trials showed the hatching efficiency of 94.47 while the third trial was 97.23.

The construction cost of the device is 15,268.00. The investment will return after 11 operations estimated in 231 days if it continues to operate.

Based on the results of the study, it is then recommended to use the chicken hatchery in small poultry farm especially in rural areas. The modified device is efficient to use as alternate of the commercial hatchery or incubator in poultry.

ABSTRACT

SAYABAT, GREGGY MARK G. Mariano Marcos State University. May 2021.
STORY-BASED LESSONS FOR THE TEACHING OF MOTHER TONGUE ALPHABET AMONG KINDERGARTNERS.

Major Adviser: Irene T. Acuna, MED

Using the descriptive research design employing the Research and Development (R&D) method, this study developed and validated story-based lessons for the teaching of mother tongue alphabet among kindergartners which aimed to address the current dearth of contextualized instructional materials in early childhood education. Two data gathering instruments were used in the study. The validation rating scale on the features of stories for kindergartners anchored on Coyle's (2007) study on crafting stories for kindergartners was used to validate the crafted stories and the content validation rating scale patterned after Pangat (2012) was used for the content validation of the story-based lessons for the teaching of mother tongue alphabet. The data gathered from the content validation of the crafted stories and story-based lessons for the teaching of mother tongue alphabet were interpreted and analyzed through weighted means.

Based on the results of the study, the features of the stories such as storyline, plenty of repetition, opportunities for participation, appropriate linguistic level, language accuracy, and socio-cultural sensitivity are highly evident. Similarly, the story-based lessons were assessed as very highly valid in terms of objectives, activities, and instructional characteristics. Therefore, the material is ready for use by kindergarten teachers in teaching the letters of the mother tongue alphabet.

ABSTRACT

SERRANO, NOEMI C. Mariano Marcos State University. May 2019.
SCIENCE TEACHERS' LEVEL OF USE OF DIFFERENTIATED INSTRUCTION STRATEGIES AND PUPILS' PERFORMANCE.

Major Adviser: Dr. Natividad E. Lorenzo.

This study determined the relationship of the Science teachers' level of use of differentiated instruction strategies to pupils' performance. Employing the descriptive-correlational method of research, a random sample of 40 Grade 6 Science teachers in the Schools Division of Ilocos Norte and their Grade 6 pupils during the school year 2018-2019 were taken as respondents of the study.

A survey questionnaire was used to determine teachers' level of use of differentiated instruction while pupils' performance was indicated by their mean score on a concept test in Science 6. The findings of the study revealed that the Science teachers used differentiated instruction strategies to an average level. Specifically, flexible grouping was used to a very high level, and interest centers/interest groups, learning centers/learning stations, varied instructional materials, and provisions for pupils' choice and varying questions to a high level.

Science teachers make average use of learning contracts, tiered assignments, independent projects/investigations, independent study, and pre-assessment data; and curriculum compacting to a low level. Pupils' performance in the concept test in Science was merely satisfactory and thus, this was significantly related to their Science teachers' level of use of differentiated instruction strategies. The higher the level by which Science teachers use differentiated instruction strategies, the better is the performance of the pupils.

The most common problems encountered by the Science teachers in the implementation of DI strategies are lack of materials, lack of planning time, lack of knowledge, lack of experience and lack of support from the school administration. It was concluded that the use of differentiated instruction strategies significantly affects pupils' performance. This supports the stand that since people have different kinds of intelligences and abilities as stipulated in the theory of multiple intelligences, differentiated instruction should be used by teachers in teaching their classes.

ABSTRACT

SIMON, PRICILLA FAYE T. et.al. Mariano Marcos State University. **AUTOMATED SOLAR POWERED DRIP IRRIGATION SYSTEM FOR TOMATE.**

Adviser: Engr.Thomas U. Ubiña

Due to climate change, dry spells became longer while rain that used fall in six months is dumped in matter of days. High labor cost and fuel cost and limited amount of irrigation sources are the factors that drives farmers to leave their farms idle during the dry season that can significantly affect their income. Common irrigation practice of farmers is flood irrigation for its simplicity; however, it is 50% efficient and requires higher number of labors to do tasks. Drip irrigation and sprinkle irrigation can be option to increases irrigation efficiency. However, the high cost of materials of the systems limits their adaptability. PhilRice Batac developed a low-cost drip irrigation system (LDIS) using locally available materials to address the high cost materials of drip irrigation. The developed LDIS cost is 50% lesser than the commercial drip irrigation. Though the LDIS has promising performance, adaptability to framers is still low. Since, the LDIS still relies from fossil fueled powered engine pump and it requires day-to-day labor to operate the engine pump, refill the reservoir and to activate the LDS. Automated Solar Powered LDIS was designed and developed for 100 m² tomato area to test the efficiency of the solar power functionality of the automation system and to determine the projected partial budget analysis, return of investment and payback period for a 1000m² tomato area. The result shows the designed Solar System can generate sufficient electricity to meet the load demand; and designed Automation System is operational with functionality test of 100 percent. The Automated Solar Powered LDIS is significantly better than the LDIS alone in irrigating high0value crops like the tomato in terms of water savings. Furthermore, the Automated Solar Powered LDIS is profitable and acceptable as can be seen from the partial budget analysis and return of investment analysis of the system.

ABSTRACT

SINGSON, FRANCES JOCELLE C. Mariano Marcos State University. December 2019. **TEACHERS' ATTITUDES AND BELIEFS TOWARDS INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) AND THEIR EXTENT OF UTILIZATION FOR TEACHING AND LEARNING.**

Adviser: Dr. Artemio P. Seatriz

This descriptive-correlative study aimed to describe teachers' attitude and beliefs towards ICT and their extent of utilization for teaching and learning. The participants were 136 public elementary schools teachers in Cabugao District, Schools Division of Ilocos Sur during the School Year 2018-2019. They were randomly selected according to the grade level they were teaching.

This study was a researcher-made survey questionnaire in gathering the needed data. The researcher also conducted informal interviews with selected teachers to supplement the data gathered from the survey. The data gathered were analyzed using frequency and percentages distribution, weighted mean, Pearson r correlation, and point-biserial correlation.

Results revealed that the teachers are in their early adulthood, predominantly females, married, with some master's degree units, occupying Teacher III positions, and with varied length of service. However, results also show that many have not attended any ICT-related seminar/training.

Moreover, the participants indicate a very favorable or positive attitudes and beliefs towards ICT. However, they only use ICT sometimes for teaching and learning because of some problems and challenges they encounter like lack of time, insufficient technical support, very costly devices and lack of training.

ABSTRACT

SUAREZ, NORALYN SACOCO. Mariano Marcos State University. May 2020.
STAKEHOLDERS' AWARENESS AND IMPLEMENTATION OF THE MANDATED PROGRAMS, PROJECTS AND ACTIVITIES (PPAs) AMONG PUBLIC ELEMENTARY SCHOOLS.

Major Adviser: Elena Edna C. Nagtalon, Ed.D.

The descriptive-correlational study aimed to describe stakeholders' level of awareness and implementation of the mandated programs, projects and activities (PPAs) of the Supreme Pupil Government Organization (SPGO) among public elementary schools. Further, it ascertains relationships between and among the said variables.

The study involved the 54 Grade 6 SPG officer, who are presently handling key positions in the organization such as the president, secretary and auditor, 18 SPG advisers and 18 school heads from Bacarra Districts I and II from the Schools Division of Ilocos Norte.

A researcher-made survey questionnaire based on the DepEd Order no.49, s.2011 was used to gather data on the stakeholders' level of awareness and implementation of the mandated PPAs. Informal interviews were also conducted to selected stakeholders to supplement the data gathered from the survey. Data gathered were analyzed using means, Pearson r coefficient correlation and One-way ANOVA and Duncan's Multiple Comparisons Test (DMRT).

Findings revealed that the SPG officers are *highly aware* of the mandated PPAs, while the SPG advisers and the school heads are *very highly aware* of the mandated PPAs. Results also revealed that the mandated PPAs are moderately implemented as perceived by the SPG officers.

Meanwhile, the SPG advisers and the school heads perceived that the mandated PPAs are *highly implemented*.

ABSTRACT

TACTAC, DENNIS I. Mariano Marcos State University. May 2020. **PERFORMANCE ASSESSMENT OF EXISTING SOLAR – POWERED IRRIGATION SYSTEMS (SPIS) IN REGION I, PHILIPPINES TOWARDS POLICY FORMULATION.**

Major Adviser: Virgilio Julius P. Manzano, Jr., Ph.D.

A study on the performance of the existing Solar Powered Irrigation System (SPIS) in Region 1 was conducted to evaluate the viability of SPIS as an alternative means of irrigation in the region's agricultural production. It sought to evaluate the system performance in terms of discharge rate, the intensity of solar irradiance, pump efficiency, panel efficiency, and system efficiency. Also, to identify problems, issues, and good practices as a basis for policy formulation and formulate design parameters for the enhancement of the system.

The study results would serve as a basis for the enhancement and maximum utilization of the SPIS systems. High performing and efficient SPIS contributes to the timeliness of production and increases income by reducing irrigation expenses. Likewise, the formulated policies for the SPIS's implementation were likely to significantly contribute to the proper management and longer operational life of the system.

ABSTRACT

TAGATAC, ROWELL C. Mariano Marcos State University, July 2017. **DANCE TROUPE MEMBERS' ATTITUDES TOWARD AND EXTENT OF ENGAGEMENT IN STRENGTH AND CONDITIONING EXERCISES.**

Major Adviser: Dr. Rhoda Beth M. Santos.

With the premise that dance is considered as a significant form of human movement, this research aimed to ascertain the attitudes of dance troupe members participating in the Tan-Ok festivals towards strength and conditioning exercises (SCE), together with their level of engagement to the latter.

The study used the descriptive-correlational design. It was conducted in the Province of Ilocos Norte. A total of 234 respondents were randomly chosen from among the coastal, highland and lowland areas of the province. The questions were arranged as an attitude and were classified based on the general criteria of significance, benefit, and relevance of the strength and conditioning exercises. The questionnaire was crafted in the form of a 4-point scale. Also, engagement of the aforementioned protocols was presented as different SCE activities that the respondents rated according to the following descriptions in a Likert scale presentation.

Results revealed that the dance troupe members, in general, regard SCE on a positive tone as to its significance, benefits and relevance to the dance art. They also show varying degrees of engagement of different SCE. As a dancer matures, the more that he or she gains a more positive attitude towards SCE. Lastly, a positive attitude by the dancer ensures engagement to the SCE to the great extent.

ABSTRACT

TARRIGA, CHRISTINA S. Mariano Marcos State University. May 2019. **EFFECTS OF GRAPHIC INTERCHANGE FORMAT (GIF)-ENHANCED LESSONS ON STUDENTS' PERFORMANCE IN SCIENCE.**

Major adviser: Dr. Natividad E. Lorenzo

This study determined the effects of graphic interchange format (GIF)-enhanced lessons on the performance of students in Science using the experimental two group pretest-posttest design. A teacher-made test that served as pretest and posttest was the main tool in gathering data. The lessons in the Learner's Manual that were enhanced with GIF were units on Particle Nature of Matter (Module 1), The Structure of the Atom (Module 2), and the Periodic Table Elements (Module 3).

Two Grade 8 heterogenous science classes with 35 students each at Pinili National High School served as subjects of the study. The pretest was administered to the two groups after which, the two treatments were randomly assigned to the tow classes; that is the method using GIF-enhanced lessons was assigned to section Purity while the traditional laboratory-lecture method was assigned to section Charity.

Data were analyzed using frequency counts, percentage distribution, standard deviations. In the inferential aspect, the t-test of independent samples and t-test of two-dependent samples were applied and the level of significance was set at the 0.05 probability level.

Results showed that the significant difference exists between the pretest and posttest mean scores of two groups, with their posttest mean scores being significantly higher than their pretest mean scores, indicating that the two methods were effective in teaching science concepts and improving science process skills. However, the results of the t-test of difference between the posttest mean scores of the experimental group was significantly higher than that of the control group. This implies that the Graphic Interchange Format (GIF) -enhanced lessons were more effective than the traditional laboratory-lecture method in teaching science concepts and in the improvement of the science process skills of the grade 8 students.

ABSTRACT

TAWALI, HALLEN T. Mariano Marcos State University. May 2020. **POZ SA AQUAIRIUM: A PHENOMENOLOGICAL STUDY ON THE QUALITY OF LIFE AMONG PEOPLES LIVING WITH HUMAN IMMUNODIFICENCY VIRUS (PLHIV).**

Major Adviser: Federico V. Nagtalon, Ed.D.

This is study pursued to describe, explore and understand the quality of life among people living with human immunodeficiency virus. The study as guided by qualitative phenomenological approach specifically descriptive phenomenology as the research design. The participants wee people living with human immunodeficiency virus residing in Ilocos Norte, aging from 19-51 years old at the time of diagnosis, regardless of sex, presently enrolled in medical centers treatment hub and presently admitted in the hospital during the data gathering period. Those who are currently experiencing opportunistic infection and expressed unwillingness to participate were not included in the study.

The participants were selected through non-probability sampling specifically, purposive sampling technique. Data were gathered through interviews using a semi-structured and open-ended questions from July 2019 to September 2019. The data gathered were analyzed using the Colaizzi's method of phenomenological analysis. There are Six major these emanated from the transcripts of interviews revealing the life experiences and quality of life among peoples living with human immunodeficiency virus.

ABSTRACT

TOBIA,REGINA HILARIO RAMOS. Mariano Marcos State University.May 2020.
AWARENESS AND ATTITUDES OF THE FACULTY OF THE TESDA TECHNOLOGY INSTITUTIONS IN REGION 1 ON THE NATIONAL BUDGET CIRCULAR No.461.

Adviser: Ninfa S. Asia,D.P.A

With the use of descriptive-correlational research design, this study determined the relationship between the level of awareness of the TESDA Technology Institutions faculty and their attitudes towards the National Budget Circular No. 461 (NBC No.461). It also looked into the relationship between their level of awareness and attitudes to their socio-demographic characteristics.

From the population of 85 regular faculty,63 faculty members of the TESDA technology Institutions in Region I for the School Year 2019-2020 were taken as respondents to comprise the sample.

Data were gathered through a researcher-made questionnaire and were analyzed using frequency counts, and percentages,mean,Pearson r and point-biserial correlation.

Results revealed that the faculty of the TESDA technology Institutions in Region belong to the TESDA Qualifications group,have conducted three to five relevant trainings/seminars for the last three years and are in service for one to five years.

ABSTRACT

TUDLONG, ZYRA MAE S. Mariano Marcos State University. May,2019.
AVAILABILITY, ACCESSIBILITY AND EXTENT OF USE OF MANIPULATIVE MATERIALS IN TEACHING SCIENCE.

Major Adviser: Dr. Natividad E. Lorenzo

This study determined the availability, accessibility and extent of use of manipulative materials in teaching science.

The study was conducted in the Division of Laoag City involving all the 34 teachers teaching Elementary Science 5 in the different public elementary schools in the division. The quantitative descriptive survey method was used.

The questionnaire was the main tool data gathering. Unstructured interviews and ocular visits to the science rooms taking note of the manipulative materials specifically laboratory apparatus was also undertaken to validate the data gathered through questionnaire. The data were statistically analyzed using means.

The findings of study showed that manipulative materials are available and accessible in the public elementary schools but inadequate.

It was also found that the extent of use of the manipulative materials is moderately used by teachers and students in their classes.

Inadequate materials were the main concern of the teacher respondents as regards to context-caused problems, students' attention on teacher-related problems and students not considering the activities as entertaining and noise caused by students in the laboratory as regards to student-related problems.

It was concluded that the elementary Science classroom of the Division of Laoag City have available and accessible but inadequate manipulative materials. Generally, these materials are not always used by the teachers because of some concerns. The limited use of these materials also leads to some of the problems encountered by the teachers in conducting laboratory classes.

ABSTRACT

VALENCIA, MARK JANREE L. Mariano Marcos State University. May 2020.
EFFECTS OF PHOTOVOICE IN PROMOTING TRANSFER OF LEARNING AND ENHANCING 4Cs AMONG LIFE SCIENCES STUDENTS.

This is a descriptive research using one group pre-assessment and post-assessment design which determined and analyzed the effects of Photovoice in promoting transfer of learning and enhancing critical thinking, collaboration, communication, and creativity skills (4Cs) of 35 Grade 11 students in Life Sciences. It also identified the problems encountered by the students in the use of Photovoice along with transfer of learning and the development of 4Cs.

The data on the student's extent of manifestation on the transfer of learning and 4Cs were gathered using questionnaires, focus group discussion using semi-structured interview guide, classroom observations and output evaluations using rubrics. Mean were used for the descriptive data analysis and thematic analysis was utilized for the qualitative data obtained from the participants.

It is recommended, therefore that the Photovoice be used as pedagogical tool in teaching life sciences for students to become lifelong learners of this 21st century.

ABSTRACT

VALENZUELA, MAYROSE E. and GUDOY, NOLI ANGELO F., Mariano Marcos State University. May 2021. **DEVELOPMENT OF A SOLAR ENERGY SYSTEM FOR DRYING.**

Major Adviser: Engr. Samuel S. Franco, MSAE.

Open-air sun drying or direct and uncontrolled sun drying is still the most popular method of preservation and storage but leads to contamination, theft or damage, no protection from rain, dew or any storm that causes poor quality of the dried product. Drying involves heat and mass transfer and changes several parameters of the product such as volume, density, mass, moisture content, humidity inside, product size, chemical changes along with the product quality.

Such disadvantages encouraged developers, innovators to make a closed solar dryer. Several types were developed which include solar-biomass hybrid solar dryers. Students of Jazan University also developed a solar dryer which uses temperature and humidity sensors.

These inspired the authors of this paper to design and develop a Solar Dryer to solve the problem of quality caused by drying in an open environment. A closed chamber solar dryer which uses the roof of a building painted with black paint as a solar thermal collector and 12V DC fan that sucks the heated air to the drying chamber. A solar dryer provided with an alternative power supply that automatically works when the battery reaches 11.5 volts to prevent over-discharge.

The results obtained during the test period revealed that the temperatures inside the dryer and solar collector were much higher than the ambient temperature during most hours of the day-light. And the black paint is concluded to have a great help in increasing the temperature. The heated air temperature that pumps inside the drying cabinet were up to 60-70 degrees Celsius for about three hours just before and after 12noon, depending on the weather condition. The dryer exhibited sufficient ability to dry food items rapidly to a safe moisture level, and it ensured a superior quality of the dried.

ABSTRACT

VENTURA, JAMES CEASAR A. Mariano Marcos State University. May 2020.
INDUSTRY-BASED LEARNING RESOURCE PACKAGE ON SELECTED TOPICS IN PHYSICS.

Major Adviser: Vida V. Antonio, Ed.D.

In order to realize a contextualized and inquiry-based Science education as mandated by the K to 12 Law, this study aimed to develop an Industry-Based Learning Resource Package (IBLRP), composed of a Learner's Material and a Key to Correction, on selected topics in Physics contextualized on the basis of local industries in Ilocos Norte.

The Descriptive research design using the Research and development (R&D) methodology was used in the study. A focus Group Discussion (FGD) with ten (10) Physics teachers was done for the identification of appropriate contexts corresponding to specific learning competencies that guided the development of twenty (20) activities included in the IBLRP. Then, an expert panel composed of thirty (30) teachers who are teaching Physics and with a rank of a least Teacher III validated the material using a research-made IBLRP validation toolkit.

Local industries that are potential sources of teaching materials can explain and demonstrate Physics concepts abound in Ilocos Norte. These industries include agricultural, fishery, loom weaving (*panag-abel*), ceramics/pottery making, iron works, salt and bagoong making, basi and vinegar making, food manufacturing and processing, renewable energy, and tourism and transportation.

The Industry-Based Learning Resource Package (IBLRP) developed is inquiry based that is composed of a Learner's Material and an accompanying Key to Correction. The essential features in the Learner's Materials include introduction, objectives, materials, needed, procedures, checkpoint, summing it up and going beyond. Meanwhile, the additional features in the Key to Correction are contextualization guide, suggested answer, and summary of key concepts. The IBLRP was developed by matching relevant Physics concepts with the appropriate local industries which include agriculture, fishery, iron works, food manufacturing and processing, renewable energy and tourism and transportation. These have built-in physics concepts which are in motion in one dimension, waves, characteristics of sound, heat, heat transfer, Newton's three laws of motion, curricular motion, work, power, gravitational potential energy, kinetic energy, elastic potential energy, conservation of mechanical energy, heat engines and their efficiency, electrical energy generation and transmission in power plants. Electromagnetic spectrum, motors, generators, measurements and conversions, vectors and scalars, mass versus weight, friction, normal force, acceleration, impulse and momentum, ideal gas laws, Carnot cycle and entropy.

The IBLRP was evaluated as very highly valid on all validation components: objectives (3.87), content (3.92), instructional characteristics (8.84), and evaluation characteristics (3.91). As a whole, the IBLRP was rated very highly valid with an overall mean rating 3.89, which implies that it is valid instructional material in teaching Physics. The IBLRP, being composed of

contextualized and inquiry-based activities, adheres to the theory of constructivism. The IBLRP guides the students to reflect on their existing knowledge and experiences of the local industries and correlates them with the newly encountered Physics concepts allowing them to “construct” new knowledge and relationships. This mental process on the part of the learner strengthens his retention and appreciation of the physics concepts learned.

ABSTRACT

VENTURA, JAMES III. G. Mariano Marcos State University. May 2020.
**PORTRAYALS OF GAY CHARACTERS IN CONTEMPORARY INDEPENDENT
FILIPINO-PRODUCED FILMS.**

Adviser: Marlina L. Lino, Ph.D.

Using content and textual analysis, the study aimed to analyze the portrayal of gay characters in five recognized and award contemporary independent Filipino-produced movies with gays as lead characters from 2014-2018. Specifically, it described the story structure of the movies, the roles the gay characters play in the movies and the extent these roles are portrayed, how the gay characters' journey lead to the outcomes and the development in the portrayed of gay characters from 2014-2018.

Results of the study show that the contemporary independently – produces Filipino films with gya characters still follow the conventional study structure using flashback technique and the traditional chronology of events. Gays portrayed in the movies generally belong to the age bracket, 34-42 years, are single, wage earners, and belong to the middle class. Moreover, they are *ectomorphs* in body type, and *extroverts*, and are portrayed as *discreet* gays. Interestingly, they are ambitious for career growth and professional development, discriminated by their family and society, and most importantly, capable of accepting that gay relationships are not forever. Finally, the portrayal of gay characters from 2014-2018 can be described as extrovert gays who are *economically elevated, assertive, talkative, dependable, responsible*, and belong to the *middle class* who are now earning and working individuals. They are likewise *realistic* and not the stereotypical types. With these, analyzing meanings and relationships in discourses brings about and extensive description of hoe gays are portrayed in contemporary Filipino-produced films.

ABSTRACT

VERDADERO, DAEVAN D. Mariano Marcos State University, May 2020.
SUSTAINABLE AND ECO-FRIENDLY PRACTICES OF WINNERS IN THE NATIONAL SERACH FOR SUSTAINABLE AND ECO-FRIENDLY SCHOOLS.

Major adviser: Eva B. Macugay, Ph.D.

This study determined and analyzed the sustainable and ec-friendly practices of winners in the National Serach for Sustainable and Eco-Friendly School (NSSEFS) and its implications to the local socio-cultural values of the Luntiang Puso. It utilized the descriptive design.

The sustainable and eco-friendly practices of the winning schools in the NSSEFS were determined using a survey questionnaire, interviews, Focus group Discussions (FGD) and on-site validation. One – hundred fifty Grade 12 students, six science teachers, and three school administrators from the Schools Divisions of Ilocos Norte served as respondents of the study.

Results of the study revealed that the winning schools evidently practice the criteria set by the Department of Environment and Natural Resources- Environmental Management Bureau (DENR-EMB) \in the NSSEFS. These include the: 1) clear articulation and integration of social, ethical and environmental responsibility in the institution’s vision, mission and governance; 2) environment dimensions of school operations; 3) environment-related features of the school curriculum;4) the presence of vibrant eco-organizations in campus; 5) the presence of environmental partners and linkages in various programs, projects and activities; 6) socio-cultural sustainability; and 7) economic sustainability. Implications to the local socio-cultural values as key drivers of the Environmental Education in the Philippines and Sustainable Development Goals (SDGs) were identified.

ABSTRACT

VIERNES, JOHN PAUL M. Mariano Marcos State University, December 2020. **DIGITAL GAME-BASED LEARNING MATERIALS IN THE LIFE SCIENCES.**

Major Adviser: Prof. Aleli R. Martin

This study aimed to develop Digital Game-Based Learning Materials (DGBLM) to provide resources for enhancing lessons in the life sciences. The research and development methodology were employed. The materials were assessed and validated by all life science teachers of both public and private schools in the Schools Division of the City Batac. The research instruments used in the study are needs assessment survey for teachers, and the checklist for the validation of the DGBLMs. The percentage of response and weighted means were used to determine the validity of the materials as to content quality, instructional quality, and technical quality. The results revealed that three competencies are considered difficult by teacher respondents. These competencies include: explain the concept of a species (S8LT-IVG-19), classify organisms using the hierarchical taxonomic system (S8LT-IVH-20), and explain the advantage of high biodiversity in maintaining the stability of an ecosystem (SSLT-IVG-21). From these competencies, five lessons were identified which are: types of biodiversity, taxonomic classification system, five kingdom systems, high biodiversity and low biodiversity, and biodiversity preservation. Studies have confirmed that biodiversity is a possible lesson in developing DGBLM. Thus, nine DGBLMs were developed from these lessons using Scratch 3.0 software.

The developed DGBLMs went through formative evaluation before the content validity phase. Feedbacks were collected from digital game creators, educators, and subject-matter experts. Results of the formative evaluation were the basis for the modification of the materials. Findings showed high degree of validity of the materials as to content quality, instructional quality, and technical quality. Therefore this study proves that the developed digital games can be regarded as great mechanical tools which can support or even enhance children's learning.

It supports the constructivist theory that digital games can provide learners with the interaction between thought and practical activity, and the gamified learning theory that the engagement of students in active experiences is considered to be a very important element of learning and it is highly connected to the playing of digital games.

ABSTRACT

VELASCO, JOAN JESUSA B. July 2019. Mariano Marcos State University.
**PERCEPTIONS ATTITUDES AND PROFICIENCY LEVEL OF COLLEGE STUDENTS
IN WRITING.**

Thesis Adviser: Ronald Candy S. Lasaten, Ph.D.

Using the descriptive-correlational research design, this study determined the college students' perceptions, attitudes and their proficiency level in writing. Further, this study related the students' perceptions and their attitudes in writing their perceptions in writing and their writing proficiency level, and their attitudes in writing and their writing proficiency level.

This study involved the written outputs of the 135 first year Bachelor in Secondary Education (BSEd) and Bachelor in Elementary Education (BEEd) students, who are enrolled in Purposive Communication subject offered in the different colleges and universities in Ilocos Norte during the second semester of Academic Year 2018-2019.

The study used a survey questionnaire patterned after the Writing Survey of Podson (1997) to determine the students' perceptions and attitudes in writing. Meanwhile, a generalized written output rubric patterned after the National Council for Teachers in English (2013) was used to determine the students' proficiency level along content, organization, voice, word choice, sentence fluency and convention. Data were analyzed using weighted means, frequency, percentage and Pearson (r) correlation.

Findings reveal that the students have favorable perceptions and attitudes in writing. It was further revealed that the students writing proficiency level along content, organization, voice, word choice, sentence fluency and conventions is fair. Also, the students' perceptions and attitudes in writing are significantly related to one another. Moreover, the students' perceptions and attitudes in writing are significantly related to their proficiency in writing.

ABSTRACT

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It supports the constructivist theory that digital games can provide learners with the interaction between thought and practical activity, and the gamified learning theory that the engagement of students in active experiences is considered to be a very important element of learning and it is highly connected to the playing of digital games.

ABSTRACT

YUMUL, HERDY L. Mariano Marcos State University, July 2016. **ASPIRATIONS AND HABITS OF COLLEGE STUDENTS FROM TRANSNATIONAL FAMILIES: BASES FOR PROGRAM ADMINISTRATION.**

Major adviser: Prof. Margarita G. Hilario.

The study examined the aspirations and habits of college students from transnational families for use as bases for policy recommendations. It was guided by the Ideal-Type Method of Max Weber and the Participative Governance Model.

Conducted in the Mariano Marcos State University, Batac Campus, the study had one hundred fifty respondents, representing half of identified college students from transnational families. An Interview schedule served as tool in data gathering. Percentage, frequency counts and means were used in data analysis. To ground the results of the quantitative data, in-depth interviews were also conducted with selected respondents.

Most of the respondents are first year and second year students aged 17 to 18. There is an equal number of male's respondents. Most are Roman catholic. Most have two to four siblings and are positioned as middle, eldest or youngest among their siblings. Some are the only child in their respective families, more than half of the respondents are living with extended families. A big majority receive a monthly personal allowance ranging between 2,000 and 7,999.

As to respondents 'migrants' parents, half of them are mothers while around a third are fathers. Some respondents have both parents abroad, more than half of the respondents have married parents while others are either unmarried, separated, or widowed. Less than half of the parents are college graduates. Most finished either high school or elementary, which partly explains why two thirds of the respondent's parents are into blue collar jobs. Less than half of the parents have been abroad for less than 10 years while most have gone overseas for 11 years or more.

In general, the respondent's aspirations along education, social relationships, health and finances are high while habits along these lines are practiced only sometimes.

To address the gap between the respondents' aspirations and habits to promote the general wellbeing of college students from transnational families, a consultative-workshop was conducted with representatives from various agencies and sectors as participants. In this activity, the results of the study were discussed and policy recommendations were drafted by the participants themselves.

