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DEVELOPMENT AND ADVANCEMENT AMONG THE ERUMANEN NE MENUVU THROUGH ENHANCEMENT AND EMPOWERMENT

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ABSTRACT

The preference for development options and advancement initiative takes several perspectives. This paves the development as a way for progressive ambition. This serves the advancement as a path for new environment and learnings. Development has different mental vision and visible scene with growth of the completed endeavor. This is expansion of rendered benevolent support and equipped with changes in the effort and exertion of human endeavor. The visioning of advancement is fixated among societies. It has a total improvement and upliftment among the underprivilege and vulnerable sectors for redeeming from the bondage of poverty by acquiring sufficiency. Methodology: The study uses the qualitative research design. This is phenomenological with investigative inquiry approach. The participants are elders, women, youth, family heads. The use of purposive sampling techniques is by allowing the availability of the participants to express their views, opinions and ideas. The data collection used are interview, observation, focus group discussion. It is consolidated in the matrix with thematic analysis and interpretation. Finding: The study achieves the options that create another milestone for victory. This is the attainment of improvement that generate freedom from success. It is totality and fulfillment of the endeavor through unity, solidarity and camaraderie. The common experiences are turned into more productive undertakings that leaves great lesson for planning. It leads to enhancement of ability, capability and capacity. This is guided towards empowerment of an individual, a group and a community for a progressive performance. It is the success towards the community development and technology advancement.

Keywords: Development, Advancement, Enhancement, Empowerment

INTRODUCTION

Background of the Problem

The preference for options and initiative follows development and advancement. Development is an ambition of everyone. Advancement is an aspirational for driven to move forward. It is the enhancing potentials and skills for total empowerment and advancement. This chapter presents the background of the problem, significance and the purpose. Development has several perspectives. It has different mental vision and visible scene. It is a growth of the completed endeavor and sacrifices. It is the expansion of the rendered benevolent support. It is the changes of the previous effort and exertion of human endeavor. It is the totality of increasing maximum capacity, capability and ability in achieving goal. Theories of development provides tools to analyze existing situations and identify obstacles that hinder societal change. There is a need for constructing models that overcome obstacles. It is transforming conducive reality for change. The change motivates people in working hard thar entice in the involvement process. It needs socio-cultural transformation, socio-political reformation, socio-economic adaptation and socio-spiritual conviction (Rabie, 2016).

The Erumanen ne Menuvu is visioning for advancement that are fixated among societies. This is the total improvement and upliftment among the underprivilege and vulnerable sectors for redeeming from the bondage of poverty. Advancement requires behavioral change, workplace reformation, flexibility provision, creation of opportunities. It is a long-term investment that needs nurture. It remains centerpiece of government policy which needs a shared aspirations and responsi-

bilities in equal measure (Ravenhall, Hutchinson, Siobhan, 2011).

The struggle for survival in all aspect of development and advancement is a resilient factor for progressive population. The determination for subsistence permits authorization for sustaining and continuing to uplift living condition among the Erumanen ne Menuvu. It is a massive significance in human life for its growth and progress. The effort for self-sufficiency is the ultimate dream and aspiration for everyone to live harmony by leaving different difficulties in the past.

Historically, Erumanen ne Menuvu are one of the ethnolinguistics Indigenous People found in the ten municipalities of Southern Bukidnon and eleven municipalities in Northern Cotabato. There are thirteen subtribes who occupy this territory. Among these are the Derupuwanen, Dunggunen, Isuluken, Ilembaken, Ilentungen, Livunganen, Kirinteken, Lehitanen, Livunganen, Mulitaan, Pulengiyen, Simuniyen and Sinimburanen. These tribe ascribe their historical accounts base on the oral history handed down from generation to generation from the ancestors. They living with the mainstream of society by engaging an adaptation with the modernity. The aspiration in the integration with the society needs an enhancement of the skills and potentials for more productive undertakings. This the conviction among the tribes for empowerment and manages the ancestral assets.

The enhancement is the requisites for achieving permanence in development. It is a way of upgrading living lifestyle. It is a coping up from the adversaries and survive from the fittest moment. It is the enrichment of skills that augment for its progress. It is heightening for a perfect and balance improvement in whole well-being of the individual, group and community. Human enhancement improves values, morality and ethics. It needs limitation in adapting dangerous enhancing tools and technologies (Czerniawski, 2010).

It is through empowerment that liberate everyone being an individual, a group, and a community. It surpasses the bitterness in life brought by disharmony, discomfort and misleading agony in common life experiences. It disregards disasters, chaos and catastrophe that strikes the lives of the people and environment. The progression for the continuity of life towards harmony is the aim of everybody. The abundance lifestyle is the common conviction of the less fortunate and disadvantage sectors in society. This is notion of empowerment approaches that needs awareness. It is important in increasing satisfaction, recognition and engagement (Lawson, 2011).

Human development is all about human freedom. It is the freedom to realize the full potential of every human person. This is not just for a few, nor for most, but for all lives in every corner of the world now and in the future. Such universalism gives the human enhancement an approach for its uniqueness. The principle of universalism is one thing that translate practice into habitual and eventually regular job. Over the past quarter-century there has been impressive progress in many fronts of human progress. The people who are living longer are more people rising out from extreme poverty. There are fewer people being deprived from health, education and social services. The deprivation leads the citizens to move. It is the spirit of empowerment that allow them and convince for great effort in unity and solidarity. Human development has enriched human lives. The universalism principle for human development for everyone is attainable (Jehan, et.al, 2016).

The global gender examines sub-indexes in population between men and women across categories focuses on economic opportunity; cultural participation through educational attainment, healthy lifestyle and social adequacy; political empowerment (World Economic Forum, 2018). The spiritual enhancement is focusing on individual beliefs, values and goals. It is the motivation that constitutes gender gap. It is learned much about the reasons why individuals choose to engage or disengage in different activities. It is how these are achieved (Eccles and Wigfield, 2002).

Moving forward is a struggle for the fulfilling the demand for development. It is a great effort onward. It proceeds in striving the best and looks ahead for the next. This is ultimate dream for advancement among the Erumanen ne Menuvu in equating social living with the other sectors in society. This is also connecting with the mainstream looking for the betterment in the future not only for the present but looking beyond the next generation.

Significance of the Study

The study is dealt with the enhancement and development of human being. This is further commenced on the significance of development of human being. It pertains how it is existed from survival, subsistence and self-sufficiency. It is also originated on the enhancement of the ability, capacity and capability that equates with the present society. The focus is on the elevating, upgrading and uplifting of the living condition; social engagement and conducive ecological friend-

ly environment.

Socially, development holds very important implications for the future of humanity and the prospects for the progress. The limits with inherent extent of the development process can imposed by the limitation of thought, knowledge and aspiration. The social change is characterized by the process that can transformed from the low, trial and error subconscious process. This can swift and leap progress of human being in the society.

Sociologically, development views traditional issues from new perspective arriving at problem identification, problem-solving and decision-making. It can confess institutional growth and human growth as a factor in understanding development disparities. It surpasses the complexity of the concern for development and advancement. It relates to the interaction of people and the society.

Psychologically, development examines the influence of the nature that nurtures on the process of human development. It is also a process of change in context across physical, cognitive and social emotional development. it connotes to the cognitive aspect of human nature.

Statement of the Problem

The investigation focuses on the Development and Advancement Among the Erumanen ne Menuvu Through Enhancement and Empowerment. This underscores on the enhancement of the skills and potential for productive endeavor. This can underpin the development of knowledge and wisdom needed for the next generation. The significant relationship between advancement and development augments the needs for progress in the Erumanen ne Menuvu community. There is an interconnectedness in empowerment and enhancement that are addressed for the achievement of ultimate development. This is the way of reinforcing for more productive exertions. It is a means leading to a more fruitful undertaking.

The Erumanen ne Menuvu people from all walk of life are longing for development that are equally perceived by them. The heads of the family as well as the family members are yearning to yield more net worth. They are aiming to gain more profit for the future by having decent life and abundance with the support from the elders. The development and advancement are the two resolution factors that can answer the long dream and conviction for a successful and bountiful living. The empowerment and enhancement are the two working factors in achieving a benevolent and generous society.

Purpose of the Study

The Erumanen ne Menuvu people have possessed desire in looking for the best solution, suggestions and alternative for the development of the tribe. This is replicating the options that has been beyond in the society after the onset of the past experiences that they have from previous decade. It is an exploration of development and advancement within the individual, group and community. The investigation includes different programs, projects and activity that caters services looking forward for the betterment. It makes advantageous in the living condition of every Erumanen ne Menuvu vansa. The limitation of the design and procedure are discussed as a guide for future work in this area. It bears the following research questions.

1. What are the different development options existed in the Erumanen society?
2. How do these advancements take an engagement for more productive endeavor?
3. What are the benefits of the society that can be transmitted to the new generations?

It is through this research questions raised by the researcher that needs an answer. It is overbearing to be guided by the specific objectives: to wit:

1. Identify the different development options
2. Determine the common issues being encountered
3. Elicit alternative solutions that increases living condition

Theoretical Framework

The study is linked to the two theories. The Development Theory by Mario Coccai (2010) which defines the modernization, dependency, world systems and globalization. These are the principal theoretical explanations that interpret development efforts carried out especially in the developing countries. It is supplemented with the advancement theory of Frances Stewart, Gustav Ranis and Emma Samman (2018) explains that human development has relationship exploration, human development and economic growth. It challenges in the mainstream approaches showing measurement and insufficient to account for broader dimensions like politics and security. It is providing critical information for policy-makers and analyst with points of important areas that are neglected with development especially in the environments.

REVIEW OF RELATED LITERATURE AND STUDIES

Development Scheme

The development is a schematic establishment of product success indicators. The product constitutes an option which includes character features, technology advancement, and system management as the outcome involves n the product development scheme. It is a framework to model the relationship between product success and product development scheme (Suharyantia, et.al., 2015). Development has the category in assessment level of impact which consist of complying, exempting, and meriting. The complying development has low level of impact on the surrounding area. The nature of compliance can prove organizational commitment maturity. It has direct influence in the level of regulation (Celis, 2018). The exempting development has minimal impact on the local environment and may not need approval. It is typically the land uses which are not envisaged or encouraged within a particular area. This inconsistent with the objective and principles of the zone or policy area. The industrial developments in a residential zone or a new high-rise infrastructure in a heritage policy. Exempting development is not usually approved unless it is a special circumstance. The understanding of sustainable development is still at a low-level of similar to it implementation. The effectiveness of land use planning regulations such as planning acts, development plans and planning standards have also become uncertain which hinders the achievement of sustainability. The regulation to examine and evaluate the effectiveness of land use in planning regulation is achieved (Yacob, Yusof & Hamdan, 2012). The meriting development is the framework with quality, usefulness and goodness values and worth. The model-based analysis of development generations shows considerable impact in market place. The sensitivity analysis is the driving factors for this development and determined the growth of the merit-order high impact on the result (Sensfuβ, Ragwit &, Genoese, 2007). The interest is another factor for merit (Hoeffler & Outram, 2008).

There are types of development that includes the physical, emotional, moral, intellectual and social. The physical development provides ability to explore and interact with others. It gives a two-way process. The emotional development emerges of experiences expression and understanding. It connotes for opinions, suggestions and recommendation. The moral development is a continual process that occur during life span. It paves for ethical standards and performance. The intellectual development is a process of gaining and retaining new knowledge. It yearns for new learnings. The social development is a learning how to interact with other people. It is an interaction bearing the social environment (Jair & Quintella, 2008). The level of development can include the economical, political, cultural, spiritual and environmental. The economical is relating to the finances and wealth of the place as a great treasure. The political is relating to the system and freedom afforded by the place. The cultural is relating the nurturance of the heritage and its history. The spiritual is relating its sustainability and enrichment in embracing the faith and religion. The environmental is relating to the quality of air, water, soil and the ecosystem. This is an integration and interlinkage for sustainability (Basiago, 1999). Abuiyada (2018) emphasizes that development is a process towards complex goals such as the elimination of poverty, provision of employment, the reduction of inequality and guarantee of human rights. these are bounded in the development options.

Advancement Status

Advancement is an improvement relating to particular activity or area of knowledge. It is an initiative in moving forward for different possibilities. It is an uplifting style upwards. The social and infrastructural advancement is manifesting for its realization. The social advancement is deeply rooted in men, women, youth, occupation sector and professional group. Both men, women, boys and girls (United nation, 2008) have an equal opportunity in gender struggle for equality. It is a growing consciousness of gender equality as a critical societal goal that increases awareness norms, roles and identities. It can transform into social action. The men need a widespread commitment to participate in the process of transformation towards gender equality. It is an increasing partnership with women. The family status (Anulmoly & Elankumaran, 2015) is one of determinant factors in academic achievement motivation and social living condition. It is an academically favor that enhance the child's motivation to achieve success. The occupation sector (Fujishiro, Xu & Gong, 2010) has an advancement in terms of health enhancing resources, educational acquisition awareness, social welfare consciousness, nurtured skills and income generating activity. It explicitly reflecting on the social standing afforded by one's occupation. The

(Ishida, Su & Spilerman, 2018) professional group engages in the expertise and specialization. The promotion of career advancement is done in the different models that sustain its standard through sponsorship, tournament, gatekeeping and contest models. Career advancement is one of the strategies that adopts the attainment of organizational effectiveness in sustainable bases (Adewoye, Abioro & Adele, 2017). The continuing professional development capitalizes the increase in best practice. It is endowed with: a) participation and meaningful engagement to bring benefits and improvements on career mobility; b) upliftment of financial income and extent to the development of professional networks; c) enhancement of personal competencies that makes a credible springboard to gender opportunities, successful career and quality life (Tan, 2015).

The infrastructure is the fundamental facilities and systems serving an area for its economic to function (O'Sullivan & Sheffrin, 2003). Infrastructure is composed of public and private physical improvement. It is the physical component of interrelated systems providing commodities and services essential to enable, sustain or enhance societal living condition (Fulmer, 2009). There are types of viewing infrastructure which are hard or soft. Hard infrastructure refers to the physical networks necessary for the functioning of a modern industry. It includes roads, bridges, railways, tunnel, buildings, electrical grids. Soft infrastructure refers to all institutions that maintains the economic, health education, welfare and enforcement institutional and cultural standards. The economic infrastructure is a project that generate growth and enable society to function includes transport facilities (air, sea and land), utilities (water, gas and electricity), flood defenses, waste management, powerplant and telecommunication networks. The social infrastructure is an asset that support the provision of public services. It includes social housing, health facilities, educational programs and establishments, official statistics, enforcement agencies, welfare agencies, emergency response agency. The green infrastructure includes multifunctional space within and between urban areas, such as parks, recreational facilities, garden and green corridors. It enhances social livelihoods and encourage biodiversity. The public institution is required to maintain society. It includes both central government buildings and laws, rules and systems. It is created to upkeep law and order, improve educational attainment and address public health issues. This is the rules and regulations that governs the use and functioning of physical infrastructure with support of judicial system and state of governance. It ensures the development and functioning of infrastructure services by providing environment conducive to the efficient delivery (World Economic Forum, 2012). The characteristics of infrastructure includes the nonrival and non-excludability. The nonrival consumption which is the availability of one person does not diminish for others. This is allowing the reduction of cost in the utilization of infrastructure like roads and vehicle. The non-excludability is a service available to a person and generally available to others like electricity, water system, gas, telecommunication services. The sector characteristics that reduce propensity to change as well as drivers of innovation in technological, organizational and institutional terms (Markard, 2009). The features of the infrastructure include: a) investment requiring a long product cycle and time horizon, and long-term financing; b) scheme handling extremely expensive among developing countries; c) system calling for considerable and varied public sector involvement that ensures the system development and efficient operation; d) changes in land accomplishment requiring public involvement; e) framework servicing an important determinant of living standards. The feature examines the evolution of approaches and systematizes methods for assessing the infrastructure contribution (Baskakova & Malafeev, 2017). The availability of utility services especially electricity, clean water, and sanitation are strongly influenced the non-income aspects in quality of life. Private service providers cannot reap income from the positive externalities of provision of safe water that improved community health (Purb & Budiono, 2019). Luu, Nguyen, Ho and Tien (2019) imposes that the importance of infrastructure policy must continue prioritizing infrastructure led growth strategy. It allocates resources and obtains development gains from infrastructure advancement. The one-size-fits-all type government must be identified by the sectors. The government evaluation, control and enforcement actions over the constructions, execution and delivery of infrastructure projects are necessary to ensure he efficiency and effectiveness investment. The government devotes more efforts and resources of stock of human capital for the benefits of more advanced infrastructure facilities.

Manpower Enhancement

Manpower is a supply of able bodied and skilled workforce that fits to work with the tasks and jobs. The manpower training is important in

changing beliefs, attitude and behavior of individuals in increasing efficacy, efficiency and productivity. It is the investment in the employment services through adequate and sufficient potentials. It is the enabling aspect of helping organizations in coping with future changes (Akanbil & Adetunji, 2016). The human resources development, motivational tools and trainings make workers more versatile and flexible to the various tasks and jobs. The emphasis is on the effectiveness of human resource development that imbibes the practice (Okoye & Ezejiofor, 2013). A skilled worker has special skill, training, knowledge, and ability in their work. These are acquired in college, university or technical school. Skills are acquired through varied educational conventions like on-the-job training, formal and non-formal apprenticeship, technical and vocational certification and a degree completion. The attainment of primary, elementary, secondary education can gain basic skills. The graduate of higher education provides specialized skills. The post graduate level adapts the advance technical expertise. The enhancement focusses in participation, selection, and relevance of training methods to work. This can affect the clear performance of the skilled workers (Nassazi, 2013).

Empowerment Opportunities

Empowerment is the process of enabling people to increase and control over their lives. It is to gain factors decisions that shape the lives. It also increases their resources and qualities that build capacities to gain access, partners, networks and voice in order to gain control. It is now increasingly used and connected to social development groups such as poor people, disadvantaged women, destitute families, vulnerable youth, older persons, persons with disabilities, Indigenous People and marginalized sectors (United Nation Social Development Network, 2012). There is also an empowerment through technical innovation that shows need for a new view of the internal social potential of an organization. It is the environment of complex network relation that observes interdisciplinary and holistic approach, free flows of knowledge and experience, active cooperation of network participants and involvement, co-responsibility and natural trust. The application of thoughts includes a) network of social relation, b) organizational concept and c) governance lead. The network of social relation changes the perspective on the performance of management process in the direction of open, free, and dynamic system. The organizational concept matches the characterization of social potential, management culture and system architecture. The governance leads to the strengthening of internal and social potential in the environment of complex and dynamic network relations (Aneta, 2016). The employment through information and communication technology is essential for the sectors especially in the promotion of advocacy for full inclusion of social services and other social benefits (Seresh, 2013).

METHODOLOGY

Research Design

The study uses the qualitative research design of investigative inquiry. The hermeneutics phenomenological approach is used to determine and elicit experiences that can be given an action point. The experiences that transpire gives more learnings that are acquired. The experiences are given description in order to have a clear understanding and provided with interpretation to get the real essence. The experiences that are entrenched in enhancing their skills and potentials. The experiences that are initiated in empowering the group cohesion and involvement. This practice creates the venue for the opportunity in elevating lifestyle.

Sample

The participants are elders, women, person with disability, youth, and family heads. These participants have sufficient background of the different expertise in entrepreneurial skills as a venue for productive undertaking. There are 10 participants involved in the research who are responding on the inquiry. The participants have the expertise in developmental task who are also engaging in the same work activity.

Sampling Procedure

The samples are selected using the purposive sampling techniques. This is allowing the respondents availability with consent on the research to be conducted. This is giving them an opportunity to express views, opinions and ideas.

Data Collection Procedure

The research has used the interview with the participants. It is by asking the through written. It is also permitting to allow getting the idea, opinion and suggestion on what is the best to do. It is also a chance for the respondents to bring out issues that mostly affect their lives in spite of all

odds. The focus group discussion with the groups is also conducted in order to get an information. It is done by seeking their preference for discussing the issues and concern arises. The observation is a tool used to get the information in order to in-depth the understanding of their practices. It is done through interaction and exchanging of ideas. The survey is another collection technique used to get the entire picture of the community as a baseline for the intervention.

Data Analysis

The matrix is used to collate the data for tabulation. The coding is used in order to transcribe the information gathered from audio recording. The Van Manen (1990) gives an analytical basis for identifying experiences, describing phenomenon, interpreting meaning, developing meaning and clustering themes. The thematic analysis of the data is appropriately interpreted for discussion.

Ethical Consideration

The rigor of the study is anchored in Lincoln and Guba (1985) pertaining to credibility, transferability, dependability and confirmability. The credibility is connecting with a prolonged engagement with the community. It also involved peer debriefing and scrutiny. The transferability is establishing through description of the context and participants. The dependability is also established through external audit and detailed description. The confirmability is established through audit trail, triangulation, and reflexivity.

Reflexivity

The researcher is the Erumanen speaker, educator and social worker. The value of the individual especially those who belongs to sectors groups like elders, women, person with disability, youth, and family heads are given recognition. The researcher is advocating for an empowerment in their respective sector groups. They are also given a chance in the enhancement of their skills and potentials for more productivity. This is the venue for the participants to express their views and opinions. The acknowledgement of the ideas and views relevant to their experiences is given value especially in availing goods and services.

RESULT AND DISCUSSION

Sustaining Practices

Table 1 presents the sustaining of the Eruanen ne Menuvu with six themes. The first theme is about the existing development option in the area. The participant has responded that there is area with stable ecology. There are areas inside the ancestral domain having forest reserve. There is renewable energy which serves supply of potable water and electrification in the absence of electric current. This has been constructed in the remote areas. The food security is provided by the support group. This elevates the economic living in every family. The use of communication technology is rampant among the younger generation or the generation X. The elders are also joining the youth mainstream in modern technology. The elders are participating especially in pursuing higher learning. They are also using gadgets in learning lessons. The trade investment is also one of the economic options. The lending institutions are reaching out in every barangay to provide loan in minimal remittance that can be affordable by the less fortunate family heads. The infrastructure innovation is also implemented in rural areas. This is the construction of school buildings, health centers, day care centers, bridges, road concreting, water system installation and energy installation. The health services are delivered in remote areas. This is reaching out the far-flung areas to help prevent the occurrence of illness. The health prevention and restoration are acted by the health personnel. The quality education is also serving the community with the advocacy of "no one is left behind." This is anchored in education for all concept by bringing the school to the door of every population. Justice and peace are also implementing for the safeness of the community. The Erumanen ne Menuvu are active in the Kakap Dulunan, an activity of revisiting the boundary. It is a program of the Erumanen vansa in partnership with the Non-Governmental Organization. The environmental conservation is visible in the Erumanen community especially inside the ancestral domain. This is also the preservation of flora and fauna. The cultural heritage is practiced especially the performing of dances, songs and playing of musical instrument. The inventory of sacred sites and artifacts bearing historical accounts. The participants says that "*they are happy because the identity of the Erumanen is recognized based on the inventory of sacred sites, historical accounts and the establishment of different option in the place. This is the marking lines of their identity*"

The second theme is about the advancement initiative existing in the area. The participants have responded that the socialize housing is provided by the government to the families who are less fortunate. This is a shelter construction equipped with comfort room and living rooms. The recreation integrity is the utilization of the areas for sports and the training ground for the players from all walks of life. The labor and employment are holding manpower to help augment labor force that provides income for the family. The entrepreneurship is an option to sustain the skills of the family heads and the members of the family. This is the cultivation of skills for productive endeavor. The information campaign is promoting goodwill of the society through transmission. It is bringing the best knowledge to the community. The self-help group is opted to deliver goodness to the community through sector grouping. It is allowing to create an atmosphere for unity, charity and solidarity. The healthy safeties are a measure for physical fitness in everyday undertakings. It secures the observance health precaution. The modified learning system is allowing the learners who has irregular in attendance to continue their studies. It is adapting another technique acquiring education through alternative learning system for secondary and learning delivery mode for elementary. The community projects are basically the program intended for the promotion of both economic progress for a productive endeavor. The connectivity consciousness is the using of the internet connection as a mode of business transaction. This is essential option of the present era. The participant says "*the Erumanen now is different than before because of technology advancement. The living lifestyle is elevated with equal access to other support services and materials goods. This is brought by the strong globalization*"

The third theme is about sustaining the forward option and initiative. The participants responded on the reorganizational living condition. This is the formation of social welfare structure in the community. The reappraising economic is the increasing of productive activity that yield income for the family. This is the uplifting of the living condition of the community and society as a whole. The use of science and technology is the acquisition of the scientific approach and methodology in adapting modernity. The utilization of the modern equipment and the laboratory for testing and eventually the adoption for integration in lifestyle. The designing system is the expertise framework in creating venue for the implementation of infrastructure in the community. It is the way that the progressive community is changed. The adjusting lifestyle is the skillful adaption of modern way of living. This is the consciousness of the modern way of living through material acquisition and mode of behavioral upbringing. The strengthening leadership and governance are a two side of coin for proper observance. In the Erumanen ne Menuvu way of administering management is rooted in the authentic practice. The implementation of laws and issuances are strictly followed for the welfare of the community and society. The information and education campaign are social responsibility and accountability for effective change in the community. This can increase the level of participation, involvement and engagement. The implementation of school of living tradition is now in real practice. This is the manifestation of regaining the previous practice affected by the introduction of foreign practices. The configuration of physical structures is the establishment of building, erection of electricity and satellite networks and construction of bridges. This is the improvement of community landscape. The environmental preservation, protection and rehabilitation is the saving of the flora and fauna inside the ancestral domain. This is restoring from aggression, safeguarding from destruction and defensing from intrusion done by outside driven forces. The informant states that "*the initiatives are nurtured and the options are sustained in order that new generation can benefit. This is the best way to have enough preparation for the future among the Erumanen ne Menuvu*"

The fourth theme is about the providers of supports options. The participants have responded that the providers of services option are the local government units from bottom to up consisted of barangay, municipal and provincial. The extended programs, project and activities in the community are beneficial to the residence. The national government agencies extend services through the local government units intended for the beneficiaries. The non-government organization has augmented the program, project and activities undertaken by the community. The civil society group sustain the development options in the community. This is the opportunities of upgrading community features and uplifting social progress. The informants also make a comment that "*the government agency is leading in the delivery of goods and services. It is also the non-government organization have also supplemented the lacking opportunities and chances in the provision of goods and materials. The convergence is visibly*

seen".

The fifth theme is about the advancement initiatives. The participants have responded that the providers for initiatives are the development workers, social workers, educators, health and mental workers, communication and machine technicians, planner practitioners, consultant from various discipline, policy makers, environmental experts, researchers. The informants have added that "*older people are gradually adapting modern technology. But they remain in their usual practice. They are the living testimony of the ancestral assets* "

The sixth theme is about the benefits from the practices. The participant has responded about the improvement of team performance. This is gaining from united effort of doing things in a group. The prepared public accountability and responsibility is a tool of effective management functioning. The improvement of interpersonal relationship is the promotion of camaraderie inside the workplace. This is the elevation of effective and efficient performance. The acquired skills are the ability in attaining new things for personal upbringing and consumption. The mastered associated task is the skillfully and potentially performing in the assigned job. This is an application and execution of the real practice who serves as consultant. The safeguard physical plant is the securing the infrastructure that brings goodness to the community and society. This is the meaningful expression of the constituents in looking for maintenance of whatever program, projects and activities extended to them. The secured economic resources are keeping the keeping the economic wealth of the community. It is the maximum protection of the food source of the area as source of food stuff. The stability in customary and traditional practices is keeping the authentic culture preserved. It is the nurturing of the arts delight of the place as the tribal identity. The participants have said that "*they are so blessed not for the gift of God and the responses of the providers and givers. They have the chance to enjoy the abundance.*" According to Ostrom (2010) the significance and sustenance of growth experienced embarks to identify and articulate a set of priorities that focuses on the service delivery. The diverse participation from academe and community in collaboration with organizations forms the basis for advancement and development priorities.

Table 1. Sustenance Practices

Themes	Core Ideas
1.Existing development options	Ecological stability; renewable energy; food security; communication technology; tread investment; infrastructure innovation; health and well-being; quality education; justice and peace; environmental conservation; cultural heritage
2. Advancement initiative	Socialize housing; recreation integrity; labor and employment; entrepreneurship; information campaign; self-help group; healthy safeties; modified learning system; community projects; connectivity consciousness
3.Sustaining effort	Reorganizational living condition; reappraising economic; using science and technology; designing system; adjusting lifestyle; strengthening leadership and governance; information and education campaign; implementation of school of living tradition; configuration of physical structures; environmental preservation, protection and rehabilitation
4.Support option providers	Barangay, Municipal, Provincial Local Government Units; National Government Agencies; Non-Governmental Organizations; Civil Society Group
5. Support initiative providers	Development workers, social workers, educators, health and mental workers, communication and machine technicians, planner practitioners, consultants from various discipline, policy makers, environmental experts, researchers
6.Benefits from practices	Improve team performance; prepared public accountability and responsibility; improve interpersonal relationship; acquired skills; master associated task; safeguarded physical plant; secured economic resources; stability in customary and traditional practices;

Issues Encountered and Coping Style

Table 2 presents the identified issues and coping styles among the Erumanen ne Menuvu. The first theme is the problem and issues encountered. The participants have responded about the low level of education. Possibly, the Erumanen ne Menuvu community are in the remote areas where the school is quite far. The differentiation in society is the marginalization of the tribe. This is the use of varied treatment in the different client group. The peace and order situation are unstable especially within the ancestral domain with the existence of conflict. This is usually happening if the lawless element and the military forces are having atrocities. The land grabbing is dominant in the Indigenous People community especially in the Erumanen ne Menuvu territory. The capitalist and politicians are manipulating the rights of the common people. The unemployment is universal problem with limited edition for employment opportunities. This causes the low level of self-esteem. The dominant capitalist is the investing resources especially in the area of the Indigenous People. The claimed ancestral domain of the Erumanen ne Menuvu is the target for development aggression. The disease outbreak is rampant

that spreads and contaminates the constituents. But it is given preventive measures and even treated the infected citizens. The environmental hazards are the occurrence of the force development landscape in the areas and converting into tourist attractions. The historical sites bearing the cultural tradition is no longer respected. The crime is existing due to negative influence of the outside forces that has personal interest. This situation brings effect in the lives of the Indigenous People particularly the Erumanen ne Menuvu. The use of drugs and alcohol have influenced the behavior of residence in the community and even prone for criminality. This is destructive image in the society. The participants say that "*the Erumanen ne Menuvu especially the elders have the strong and positive coping especially resolving conflict and facing problems. This is disrupting the reality in life situation among the Erumanen ne Menuvu. But they have the strong determination to overcome the fittest moment. The Erumanen ne menuvu are looking forward in searching for solution especially the leaders.*"

The second indicator is about the strategy used in coping up with the situations. The participants have responded about the themes pertaining to the advocacy, forum, symposium, dialogue, trialogue, consultation, collaboration, corroboration, convergence, research and organization. This is the effective and efficient approach in coping and keeping the community away from hazard and ready for moving forward. The participants also added that "*elder have several strategies to aid in coping the irregularities and difficulties. They can easily surpass the trying moments. The elders and the leaders have strong visionary that the tribe can cope to solve the disputes and moderate in the conflict between the strong force*." Donkoh, Yelkpieri & Donkoh (2011) states that the positive interpretation and growth are most predominant strategies for problem-focused and emotion-focused coping styles. It is supplemented the understanding and perseverance in facing whatever issues encountered.

Table 2. Issues and Coping

Themes	Core Ideas
1.Problems and issues encountered	Low level of education; differentiation in society; peace and order situation; land grabbing; unemployment; dominant capitalism; disease outbreak; environmental hazards; crime; alcohol and drugs
2.Copinng Strategy	Advocacy, forum, symposium, dialogue, trialogue, consultation, collaboration, corroboration, convergence, research organization

Strategic Intervention

Table 3 presents the target intervention among the Erumanen ne Menuvu. The first themes is about the intervention that helps in solving problem, making decisions and finding solution. The participants have responded that there is an increase in situational coping. The reduction of emotional distress is also felt. This is a strong coping mechanism that overcome pent up emotions. The establishment of connection is started for an effective association. This is a joined effort to go straightforward vision, mission and goal. The partnership is developed for a well-verse transaction. This is a starting point for equality. The strengthening of linkages and networking is institutionalized as an avenue for genuine delivery of basic services. This improves the business transactions between the citizens and the firms. The improvement in line of coordination and collaboration is indorsing a positive relationship and companionship between masses. This creates new horizon for a more effective operation. The sustenance of convergence modality is also a real machinery in delivery of goods and services. This runs the affordability to avail abundancy of resources. The response to immediate and emergency concern is necessary expression in saving everybody from catastrophe. This is a religious conviction to assist the needy in time of crisis as a countenance of charity. The practice of referral and follow-up services is a monitoring mechanism. This is supplementing the lacking of benefits to avoid deprivation. The community involvement and engagement are exercise in every locality to attain a common goal. This is a participation of the constituents; an extension of goods and services and expansion of the implementer. The participants have said that "*one of the best remedies to ease the difficulty is through listening to words of wisdom from the elders. The younger ones are also observant and willing to learn. This is a symbiotic relationship between the leaders and the young ones. This is effective way of achieving goal for cooperation*"

The second theme is about the suggestive interventions of the Erumanen ne Menuvu. The participants have responded the establishment of data banking. This is a storehouse of data and information for planning process. The sustenance in tracking of data, documenting an information, and codifying of reports are accounted for proper and consistent recording. The sessions are conducted that includes assembly, meeting, conference, congress, summit, roundtable and workshop. The social gatherings and festivals are conducted for

solidarity and camaraderie. This gathers significant information. The continuous monitoring is necessary that ensures proper implementation. This is a binding relationship between the beneficiaries and the implementers. The upgrading of system is necessary to assure of a well operationalized gadget and machinery usage. This is a troubleshooting and determining its defects that affect the operationalization. The inventory of historical sites is determining the sacredness and its significance in the cultural diversity of the Erumanen ne Menuvu. This determining the historical accounts and how the preservation of culture and practices of the tribes. The formulation of strategic development plans is necessary as a guiding point in provision of programs, projects and activities. This is community-initiated plans that testify the readiness. The participatory research and community assessment are two strategies in determining the feature and designing image of the community. This is profiling the whole community. The ancestral domain sustainable development plan program is designed that ensuring the initiative and readiness of the community for the service delivery. This is community driven-plan that manifest the willingness of services implemented by the providers. The advocacy of a self-help group is intended for the sectors like the occupation group such as farmers, laborers, fishers, gatherers, harvesters, planters, caretakers, housekeeper, storekeeper. This is also open to the sectors like youth, women, heads of the family, solo parents and elderly, community-based groups, school-based, and professional. This is an avenue for exchanging ideas, suggestions, views and opinions. The participants have added that the "*elders are the storehouse of information. They are the living library of the tribe. The elders are the great source of information. This information is now transmitted to the new generation through the facilitation of school of living tradition.*" Idris, Adekalu and Genty (2014) states that the effectiveness that carries out an organizational development is determined. It improves and refine the implementation of intervention. The benefit for the changes planned for the future can be achieved.

Table 3 – Target Intervention

Themes	Core Ideas
1.Intervention	Increase situational coping; reduce emotional distress; established connection; develop partnership; strengthened linkages and networking; improve line of coordination and collaboration; sustain convergence modality; respond to immediate and emergency concern; practice referral and follow-up services; community involvement and engagement
2.Suggestions	Establish data banking; sustain tracking, documenting, codifying of records; conduct session; continuous monitoring; upgrading of system; inventory of historical sites; formulation of strategic development plans; participatory research and community assessment; designing ancestral domain sustainable development and protection plan; advocate a self-help group

CONCLUSION AND RECOMMENDATION

Conclusion

The study concludes that moving forward implicates preference of development and advancement. It achieves the options that create another milestone for victory. It is also the attainment of that generate freedom from success. It is totality and fulfillment of the endeavor through unity, cooperation, helpfulness, solidarity and camaraderie. The common experiences are turned into more productive undertakings that leaves great lesson for planning out. This is the success towards the community development and technology advancement. The thematic consolidation and interpretation give analysis of the data pertaining to development options and advancement initiatives. The sustaining practices leads to the enhancement of the Erumanen ne Menuvu ability, capability and capacity. The issues and coping style guides towards empowerment of an individual, a group and a community for a progressive performance. The strategic intervention creates a new horizon for the dream realization and fulfillment.

Recommendation

Based on the findings, the following are recommended: 1) The need to support the planning process and implementation scheme in the community to prosper in the collective effort. 2) The working closely with the sector group is needed that sustain the productive job. 3) The continuous engagement with community for progressive environment is a must for the community residence. 4) The effort in pursuing the research initiative for better policy output is address to the legislators. 5) The sustaining partnership and linkages with support group must find solution for resource mobilization.

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ORGANOLEPTIC PROFILE OF RICE-MONGO CURLS ENRICHED WITH SQUASH (*Cucurbita maxima*)

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ABSTRACT

The study aims at the improvement of Rice-mongo curls enriched with squash (Cucurbita maxima). The specific objective of the study is to determine the acceptability level of rice-mongo curls enriched with squash (Cucurbita maxima) in terms of color, texture, taste, flavor, odor, and the general acceptability, explain the level acceptability of the different treatments and compare the significant difference among the different treatment in terms of sensory qualities. The method of the study was conducted in a Completely Randomized Design (CRD) with four (4) treatments, replicated three (3) times. The mean comparison was done using the Analysis of Variance to test the significant differences. The summary of findings of this study indicates a positive perception by the panel of evaluators on Treatment four (4)) of the rice-mongo curls enriched with Squash (Cucurbita maxima) which was the most accepted treatment but Comparable to Treatment three (3). As evidenced by the evaluation conducted, it had "too appealing" color "too crunchy" texture, "too palatable" taste, flavor "too delicious" and, color or aroma was "too pleasant" Treatment four (4) was observed to have an appealing color, too crunchy texture, slightly palatable taste, slightly pleasant likewise for the proper proportion of the ingredients, As evidenced by the evaluation conducted, it had "too appealing" color "too crunchy" texture, "too palatable" taste, flavor "too delicious" and, color or aroma was "too pleasant" Based on the findings, concluded that rice-mongo curls enriched with squash (Cucurbita maxima) using six (6) kilos of rice flour, four (4) kilos of mongo flour, one (1) Tbsp. oil and five hundred grams (500) grams of water of the Treatment four (4) is the most accepted by the majority of the respondents, but comparable to Treatment three (3) with six kilos of rice flour, four (4) kilos of mongo-flour, one (1) Tbsp. oil, and five hundred grams (500) grams of water. Based on the findings of the study, the following recommendations are considered: Further study on the treatment three (3), Using of other raw materials as enrichment to the product, and it is recommended that the product be sold in school canteens, for commercialization, and to be given to those children undernourished as well as for feeding program within the school-community or even wider areas of the province.

Keywords: malnutrition, vitamin A, rice-mungbean, sensory evaluation, squash

INTRODUCTION

Many nutrients are used to fortify or enrich foods, Fortified foods contain added vitamins and minerals that are naturally present in the food or are found only in low levels. Enriched foods contain nutrients added to replace those that were lost during processing. In the Philippines, the Sangkap Pinoy, iodine, iron, and vitamin A have been mandated for the fortification of some staple's foods and other kinds of foods (Sonido et. al.,2014).

Malnutrition is one of the common problems of Filipinos. Up to the present, the Philippine government has been conducting research on how to minimize the said problem. On January 30, 1987, through Executive Order Number 128, the Food and Nutrition Research Institute (FNRI) of the Department of Science and Technology (DOST) was directed to focus on the malnutrition scenario in the country, most importantly, in the children.

The said program was rolled-out all over the nation even in remote areas. The government aims to eradicate malnutrition which is common to youngsters of this generation who are not aware of proper nutrition, and, even their parents, too.

Expert practitioners in the field of nutrition discussed the importance of nutrition with the

help of the government and local officials to fight the problem, but despite all of these, it seems that malnutrition has no end.

The word "malnutrition" refers to excesses or lack of required nutrients in the body intake, or simply eating the same kinds of foods at the same amount or more than at the same time, including eating different kinds of unhealthy food over and over. Thus, this can affect or hit anyone, rich or poor, at different age levels particularly, adolescence (Fernandez, 2011).

It has been observed in many types of research that the leading causes of malnutrition are the commercialization of unhealthy foods such as junk foods which have penetrated the market; thus, young individuals love to buy and eat them without checking their health benefits and, without the knowledge of their parents, especially the school children.

In selecting and including the right number of foods in the diet, a guide to good nutrition must be followed, Because of the expanding demands of growth and activity particularly in children, foods needs must be right and nutritious. It must be emphasized that sound food habits for an individual can give the proper nutrients needed.

Vegetables are known as a good source of vitamin A. Squash for example helps to promote good eyesight, the formation and maintenance of healthy teeth, skeletal and soft tissue; mucous membranes, and skin. It may also be required for reproduction and breastfeeding. Beta-carotene is a precursor to vitamin A that has antioxidant properties, helping the body deal with unstable chemicals called radicals.

Using squash vegetable which is very abundant and mostly found in our agricultural farms in many parts of the country, as the primary source of Vitamin A is also one way of helping the farmers to utilize their farm produced squash by other means of commercialization, not just by selling it as raw material. In this little way, farmers would be able to come up with the possible alternative means of producing other products with the help of experts and other agencies, as well as, by food manufacturers or other interested individuals who can produce and commercialize foods that are healthy and coming from our abundant farm resources.

It can also help young entrepreneurs to create their commercial products out of well nutritious raw materials. Hopefully, in the future, it will flourish in the market as one of the new inventions of this time. Aside from utilizing it as food or even as an animal feed, or selling it at a very low price during peak season, it can be processed or used by other means such as additive or enrichment materials as in the existing product like rice-mongo curls.

The interest of the researcher has been aroused to use the squash (Cucurbita maxima) incorporate in particular curls made from rice-mongo. This particular study can help individuals who love to eat commercial curls and augment the nutrient requirements of the body.

In addition, the nutrition situation in Sultan Kudarat province has need to be addressed particularly children under zero (0) to fifty-nine (59) months old, who experienced or suffers from malnutrition, based on the data forty-four percent (44%) suffers from stunting growth, eight percent (8%) is for wasting or worsening malnutrition problem, twenty-nine percent (29%) underweight, and three percent (3%) overweight (ENNS,2018).

OBJECTIVES

This study aimed to determine the organoleptic profile of rice-mongo curls enriched with squash (Cucurbita maxima) and its nutrients analysis for commercialization, specifically to:

1. Determine the acceptability level of rice-mongo curls enriched with squash (Cucurbita maxima) in terms of:
   1.1. color;
   1.2. texture;
   1.3. taste;
   1.4. flavor;
   1.5. odor, and
   1.6 general acceptability
2. Explain the level acceptability of the different treatments
3. Compare significant differences among the different treatments in terms of sensory qualities.

REVIEW OF RELATED LITERATURE

Vitamin A is the name of a group of fat-soluble retinoids, including retinol, retinal, and retinol esters. Vitamin A is involved in immune function, vision, reproduction, and cellular communication Vitamin A is critical for vision as an essential component of rhodopsin, a protein that absorbs light in the retinal receptors, and because it supports the normal differentiation and functioning of the conjunctiva membranes and cornea

Vitamin A also supports cell growth and differentiation, playing a critical role in the normal formation and maintenance of the heart, lungs, kidneys, and other organs (Andewesa, 2016).

Vitamin A deficiency is rare in the United States. However, vitamin A deficiency is common in many developing countries such as the Philippines often because residents have limited access to foods containing preformed vitamin A from animal-based food sources and they do not commonly consume available foods containing beta-carotene due to poverty. According to the World Health Organization, 190 million preschool-aged children and 19.1 million pregnant women around the world have a serum retinol concentration below 0.70 micromoles/L. In these countries, low vitamin A intake is most strongly associated with health consequences during periods of high nutritional demand, such as during infancy, childhood, pregnancy, and lactation.

In developing countries, vitamin A deficiency typically begins during infancy, when infants do not receive adequate supplies of colostrum or breast milk. Chronic diarrhea also leads to excessive loss of vitamin A in young children, and vitamin A deficiency increases the risk of diarrhea. The most common symptom of vitamin A deficiency in young children and pregnant women is exophthalmia. One of the early signs of exophthalmia is night blindness, or the inability to see in low light or darkness Vitamin A deficiency is one of the top causes of preventable blindness in children People with vitamin A deficiency (and, often, exophthalmia with its characteristic Bitot's spots) tend to have low iron status, which can lead to anemia. Vitamin A deficiency also increases the severity and mortality risk of infections (particularly diarrhea and measles) even before the onset of exophthalmia. Developing advanced AMD by 25% by taking a daily supplement containing beta-carotene (15 mg), vitamin E (400 IU dl-alpha-tocopheryl acetate), vitamin C (500 mg), zinc (80 mg), and copper (2 mg) for 5 years compared to participants taking a placebo. Vitamin A is a fat-soluble vitamin that is stored in the liver. Two types of vitamin A are found in the diet. Preformed vitamin A is found in animal products such as meat, fish, poultry, and dairy foods. Provitamin A is found in plant-based foods such as fruits and vegetables. The most common type of pro-vitamin A is beta-carotene. Vitamin A is also available in dietary supplements. It most often comes in the form of retinyl acetate or retinyl palmitate (preformed vitamin A), beta-carotene (provitamin A), or a combination of preformed and pro-vitamin A.(Tokouz,2013).

The function of Vitamin A helps form and maintain healthy skin, teeth, skeletal and soft tissue, mucus membranes, and skin. It is also known as retinol because it produces the pigments in the retina of the Vitamin A promotes good vision, especially in low light. It may also be needed for reproduction and breastfeeding. Retinol is an active form of vitamin A. It is found in animal liver, whole milk, and some fortified foods. Carotenoids are dark-colored dyes (pigments) found in plant foods that can turn into a form of vitamin A. There are more than 500 known carotenoids. One such carotenoid is beta-carotene. Beta-carotene is an antioxidant. Antioxidants protect cells from damage caused by substances called free radicals. Free radicals are believed to contribute to certain chronic diseases and play a role in the aging processes. Food sources of carotenoids such as beta-carotene may reduce the risk of cancer. Beta-carotene supplements do not seem to reduce cancer risk (Murphy, 2016).

Food Sources of Vitamin A come from animal sources, such as eggs, meat, fortified milk, cheese, cream, liver, kidney, cod, and halibut fish oil. However, all of these sources, except for skim milk that has been fortified with Vitamin A, are high in saturated fat and cholesterol. The best sources of vitamin A are: Cod liver oil, Eggs Fortified breakfast cereals, Fortified skim milk, orange, and yellow vegetables and fruits., Other sources of beta-carotene such as broccoli, spinach, and most dark green, leafy vegetables. The more intense the color of a fruit or vegetable, the higher the beta-carotene content. Vegetable sources of beta-carotene are fat- and cholesterol-free (Lydeas, 2014)

Side Effects of Vitamin A If you do not get enough vitamin A, you are at increased risk for eye problems. These include reversible night blindness and then non-reversible corneal damage known as xeropthalmia. Lack of vitamin A can lead to hyperkeratosis or dry, scaly skin. If you get too much vitamin A, you can become sick. Large doses of vitamin A can also cause birth defects.

Acute vitamin A poisoning most often occurs when an adult takes several hundred thousand IUs of vitamin A. Symptoms of chronic vitamin A poisoning may occur in adults who regularly take more than 25,000 IU a day. Babies and children are more sensitive to vitamin A and can become sick after taking smaller doses of vitamin A or vitamin A-containing products such as retinol (found in skin creams).

Large amounts of beta-carotene will not make you sick. However, increased amounts of beta-carotene can turn the skin yellow or orange. The skin color will return to normal once you reduce your intake of beta-carotene (De Shailee, 2006).

Input Process Output (IPO MODEL) is viewed as a series of boxes (processing elements) connected by inputs and outputs. Flow charts and Process diagrams are often used to represent the process. The IPO Model will provide the general structure and guide for the direction of the study. The purpose of a conceptual framework is to clarify concepts and propose relationships among the concepts in a study. To provide a context for interpreting the study findings, to explain observations, and encourage theory development that is useful to practice

The purpose of the theoretical framework is to test theories, make research findings meaningful and generalizable, establish orderly connections between observations and facts, predict and control situations, and stimulate research (Eusebio, 2014).

Enriched Food with Nutritional Additives Many nutrients is used to fortify or enrich foods. Fortified contain added vitamins and minerals that are not naturally present in the food or found only in low levels. Enriched foods contain nutrients added to replace those that were lost during processing. For example, whole-wheat kernels lose substantial amounts of vitamins minerals, and fiber when refined into white flour. Some of these lost nutrients, including iron and the B vitamins, thiamine, riboflavin, and niacin, are restored through enrichment to approximately their original levels, In the Philippines, the Sangkap Pinoy, iodine, iron, and vitamin A have been mandated for fortification of some staples: iodine in salt, Vitamin A in cooking oil, sugar flour and in rice and encouraged in other kinds of food (Sonido et., al.2008).

Rice is life for most people living in Asia. Rice has shaped the cultures, diets, and economies of thousands of millions of people. For more than half of humanity rice is life considering its important position, the United Nations designated the year 2004 as the International Year of Rice. Devoting a year to a commodity was unprecedented in United Nations history. However, the 57th session of the United Nations General Assembly noted that rice is also known as vitamin B3, niacin in rice is mostly in the form of nicotinic acid. Soaking rice in water before cooking may increase its absorption. Magnesium: Found in brown rice, magnesium is an important dietary mineral. It has been suggested that low magnesium levels may contribute to several chronic diseases. Copper: Often found in whole grains, copper is low in the Western diet. Poor copper status may have adverse effects on heart health (Arnarson, 2015).

METHODOLOGY

Research Design

The experimental research was used in a Completely Randomized Design (CRD), with four (4) treatments, and three (3) replications.

Experimental Set-up

The treatments of this experimental research were as follows:

Treatment	Ingredients
1	6 kilos rice flour, 4 kilos mongo flour, 300 grams Squash-flour, 1Tbsp. oil, 500 grams water,
2	6 kilos-rice flour, 4 kilos mongo flour, 200 grams squash flour, 1Tbsp. oil, 500 grams water,
3	6 kilos rice flour, 4 kilos mongo flour, 100 grams squash flour, 1 Tbsp. oil, 500 grams of water,
4	(Control) 6 kilos of rice -flour, 4 kilos of mongo flour, 1 Tbsp. oil, 500 grams of water

Materials and Equipment

The equipment and utensil were used in the experimental research of rice-mongo curls enriched with squash (*Cucurbita maxima*) are the following: flour grinder, digital weighing scale, flour milling machine, Electric mixer, extruder, kiln electric oven dryer, and electric dryer.

The following are the ingredients were used in this experimental squash research: rice flour, mongo flour (mung bean flour), squash (Cucurbita maxima) oil, and water.

Experimental Procedure

In the preparation of the rice flour, it was best to use ‘’Bahay” or long-stored rice because it has a low level of moisture content. To avoid some of the adhering particles which might cause failure to the finished product, this was cleaned by removing foreign objects like small stones or grains of rice. After it had been thoroughly cleaned, a milling machine was used. The rice was ground to achieve powdery form and stored at was proper room temperature until it is ready to use.

Preparation of Mongo-flour. It is important to consider the good quality of mongo seeds to achieve a good kind of finished product. Cleaning

and removing the adhering particles in the mongo seeds was done. Afterward, this was fed into the milling machine to obtain the powdery mongo flour. It was later packed in the proper container and stored it in a room temperature for future use or consumption.

Preparation of Squash-flour (Cucurbita *maxima*). It is important to choose good quality and freshly picked squash to achieve good results in the finished product. The squash was peeled-off, cleaned and the seeds were removed to dry it easily. The squash was sliced into thin pieces and placed under the hot sun. Later, it was fed into the milling machine to make it finer or even finer to achieve the expected good result. Then it was placed in a properly closed container and made ready for use.

Instrument of the Research

The study used the Sensory Evaluation to measure the respondents' perception of the different treatments of the rice –mongo curls enriched with squash (*Cucurbita maxima*) measure in terms of its color, texture, odor, using ocular evaluation of flavor, and odor using mouthfeel and sense of smell

Data Gathering

The selection of panelists composed of experienced Food Technology students of Sultan Kudarat State University (S.K.S.U), Isulan Campus, served as a panel of evaluators. A score sheet with proper instructions was given to each panelist. Before the actual evaluation, the researcher explained to the panelists how to accomplish the score sheet, and during the actual evaluation of the rice-mongo curls enriched with squash (*Cucurbita maxima*) in different treatments with three (3) replications. The treatments were properly provided with codes to avoid direct identification by the panelists.

After this, the rice-mongo curls enriched with using squash (*Cucurbita maxima*) were given to the evaluators with the score sheet. Every after tasting of the product, the evaluators were given water to drink to wash out the taste of the earlier curls to assure that they would give the authentic evaluation of each treatment.

Data Analysis Technique

After the evaluation of the rice-mongo curls, the data were properly organized, tabulated, and interpreted. To determine sensory qualities of the different treatments: Treatments 1, 2, 3, and 4 of the rice-mongo curls enriched with squash (*Cucurbita maxima*) were evaluated in terms of, color, texture flavor, taste, and aroma/odor, and the quantitative attributes of the product in terms of proper proportion of the ingredients, using their means. The F test or analysis of variance (ANOVA) was employed in analyzing the significant difference among the four (4) treatments. The Tukey-Kramer comparison Test was used as a way of separation of means.

DISCUSSION OF FINDINGS AND RESULTS

Table 1. Sensory Quality of Rice-Mongo Curls Enriched with Squash (*Cucurbita maxima*) in terms of Color

Treatment	Mean	Interpretation
T1	5.24^{c}	Moderately Acceptable
T2	5.53^{bc}	Moderately Acceptable
T3	5.89^{bc}	Moderately Acceptable
T4	6.29^{a}	Highly Acceptable

α= 0.05 level of significance; Means of the same subscript are comparable

It shows the sensory evaluation of Rice-Mongo Curls Enriched with Squash (*Cucurbita maxima*) The computed means indicate that among the four treatments, Treatment 4 was rated "very Highly Acceptance" with computed mean of 6.29 Treatments 3,2 and 1 were rated as "Moderately Acceptable" with their computed mean of 5.89 and 5.83 and 5.24by the respondents. The difference between means is significant, as evidenced by the results of ANOVA, with F=12.88 and P less than 0.001 which is less than X=0.05. There is sufficient evidence to declare that differences in the color of rice-mongo curl enriched with *Cucurbita maxima* are not due to chance. It reveals that the variations on sensory evaluation are unnatural and are attributed to the treatment. However, the results show that there is a great possibility of one treatment being the best among the four (4) treatments in the experiment. This also implies that the significant differences in terms of color were due to the percentages of squash flour used in the treatments and the control (T4) did not use *Cucurbita maxima*. Rice flour color is white to creamy white powder, which is relatively free from flecks or fragments *Cucurbita maxima* is relatively yellow in color with touches of brown thereby affecting the color of the curls. The color is a vital component in quality standards and consumer acceptance. Foods with unexpected colors are generally not well received. To consumers, color is representative of the flavors of food. For example, yellow has come to repre-

sent lemon, and green for lime or apple flavors. Increased color intensity has also been shown to increase the perceived flavor of food products (Francis, D.2011).

Table 2. Sensory Quality of Rice-Mongo Curls Enriched with Squash (*Cucurbita maxima*) in terms of Texture

Treatment	Mean	Interpretation
T1	5.83^{c}	Moderately Acceptable
T2	$6.03a^{b}$	Moderately Acceptable
T3	6.04^{ab}	Moderately Acceptable
T4	6.13^{a}	Moderately Acceptable

α= 0.05 level of significance; Means of the same subscript are comparable

The computed means in Table 2 indicate that Treatment T1 to T4 were evaluated as "Moderately Acceptable", respectively, in terms of their texture as evaluated by the respondents. Treatment 4 obtained the highest mean value of 6.13, followed by Treatment 3, with its mean of 6.04 as well as Treatment2, and Treatment 1 with a computed mean of 5.83.

The implication of the result as shown in the computed mean of the finished products, when it comes to its texture, is that there is no great distance as perceived by the respondents, it simply signifies that all treatments have the same texture as evidenced by computed mean, at were due to chances, it indicated the same perception from the respondents respectively.

Defining food texture, as it is understood today, is not an easy task, mainly because this attribute is the result of perceived stimuli of a very different nature, and because its evaluation is not an on-the-spot process. Estimation of texture is a complex, dynamic process that comprises image perception of the surface of the product, product behavior in response to the previous handling, and integration of mouth sensations experienced during mastication and further swallowing. The human brain compiles all of these, and a unique sensation is built up (Duran, 2014).

Table 3. Sensory Quality of Rice-Mongo Curls Enriched with Squash (*Cucurbita maxima*) in terms of Taste

Treatment	Mean	Interpretation
T1	5.17^{c}	Moderately Acceptable
T2	5.44^{b}	Moderately Acceptable
T3	5.44^{b}	Moderately Acceptable
T4	6.10^{a}	Moderately Acceptable

α= 0.05 level of significance; Means of the same subscript are comparable

Table 3. shows the computed means which indicate that all the four (4) treatments, Treatment 4 were evaluated as "Moderately Acceptable".

In the evaluation, Treatment 4 got the highest mean value of 6.10. This implies that it is most preferred by the respondents from among the four (4) treatments. On the other hand, Treatment 1 obtained the lowest mean of 5.17. The result of Treatment 2 with its mean value of 5.44 as-well-as Treatment 3 whose mean is as close as those of T1-T3 shows a close relationship.

This result says that every treatment has quite near and comparable to all the treatments, meaning the respondents has quite the same understanding and perception of the finished product, which means that the product has quite a similar impact on the different individual, to them all treatments were comparable as the evaluated

Results imply that results in the sensory evaluation of taste were not greatly affected by the different percentages of squash flour used in the treatments. The absence of Cucurbita Maxima in control (T4). Rice flour has a bland, typical rice flavor with no stale or off-flavors. Cucurbita maxima have properties of glycosylates which are natural components of many pungent plants and affect the taste of the curls.

The differences in the taste also imply that every participant has his perception with regards to taste and may be the same or different from each other.

Taste is a key component in sensory evaluation testing. The tongue perceives the savors among which is the basic taste i.e. sweetness, saltiness, sourness, bitterness, umami. (Sensory Analysis, 2015). Children's food acceptance and choices are highly influenced by the sensory qualities of food (Delahunty 2011).

Table 4. Sensory Quality of Rice-Mongo Curls Enriched with Squash (Cucurbita maxima) in terms of Flavor

Treatment	Mean	Interpretation
T1	5.19^{c}	Slightly Acceptable
T2	5.49^{bc}	Moderately Acceptable
T3	5.78^{ab}	Moderately Acceptable
T4	6.10^{a}	Moderately Acceptable

α= 0.05 level of significance; Means of the same subscript are comparable

Table 4 shows the computed means of the section on flavor and indicates Treatments 2 to 4 were rated "Moderately Acceptable". While on the other hand Treatment 1 has the interpretation of "Slightly Acceptable "In the evaluation, Treatment 4 got the highest mean value of 6.10. This implies that it is most preferred by the respondents from among the four (4) prepared treatments. On the other hand, Treatment 1 obtained the lowest mean of 5.19, while Treatment 2 and Treat-

ment 3 with their mean values of 5.49 and 5.78 respectively are moderately close to one another, as perceived by the respondents. Moreover, the results show that there is great leeway of one being the best treatment among the four (4) treatments involved in the study. It also tells that the flavor of the product in all treatments has a comparable impact to the respondents, moreover still moderately and has comparable flavor in all treatments as perceived by the respondents. The results imply that in terms of flavor were greatly affected by the various percentage of squash flour used in the treatments and the absence of control (T4). Rice flour has a bland, typical rice flavor with no stale or off-flavors while *Cucurbita maxima* properties of glucosinolates are natural components of many pungent plants which affect the flavor of the finished product. The flavor varies from one individual or group to another depending on the taste buds and degree of understanding. Every human being has a unique sensitivity in his sense of savor and this determines the individual's discernment.

Despite its common usage, the term "flavor" can be difficult to define. People with different know-how tend to use the term "flavor" to mean slightly different things, even if they all refer to food. Flavor chemists typically mean the aroma alone, many experts in sensory evaluation use flavor to mean the combination of taste and smell while chefs tend to see flavor as a more dynamic experience not only on the food per se but also on its presentation as well the environment it is served (Delwiche, 2004).

Table 5. Sensory Quality of Rice-Mongo Curls Enriched with Squash (*Cucurbita maxima*) in terms of Odor

Treatment	Mean	Interpretation
T1	5.32[b]	Moderately Acceptable
T2	5.61[ab]	Moderately Acceptable
T3	5.69[ab]	Moderately Acceptable
T4	5.96[a]	Moderately Acceptable

α= 0.05 level of significance; Means of the same subscript are comparable

The computed means indicate that all treatments evaluated by the respondents were "Moderately acceptable".

Treatment 4 obtained the highest mean value of 5.96 and was most preferred with the highest acceptability. The three (3) treatments evaluated with "Too pleasant" mean values are Treatment 1 with its mean value of, 5.32 Treatment 2 with its mean value of 5.61, and Treatment 3 with its comparable mean score of 5.69 similar to the rest of the treatments

There is no sufficient evidence to declare that differences in the odor of rice-mongo curl enriched with squash (Cucurbita maxima) are not due to chance. It shows that the variations in sensory evaluation are affected by the treatment. Moreover, the results show that there is a great possibility of one being the best treatment among the four (4) treatments involved in the study. The results also suggest that T2 and T3 may likely be the same as T4 as to the odor of rice-mongo curls, and the T1 is likely comparable to T2 and T3 but is quite some distance from T4.

The results imply that the sensory evaluation of odor was greatly affected by the different percentage levels of squash - flour used in treatments and the absence of Cucurbita maxima control (T4). Rice has a typical rice aroma, free from bitter moldy or other objectionable odors, and Cucurbita maxima have properties of glucosinolates which are natural components of many pungent plants affecting the odor of the curls. As cited by Costell, &. Bayarri, (n.d) according to White &Prescott (2007), a distinctive characteristic of odor-taste integration is that for effective enhancement to occur, the odor and taste components must be perceptually congruent.

Table 6. The Acceptability of Rice-Mongo Curls Enriched with (*Cucurbita maxima*) in terms of its General Acceptability

Sensory Qualities	T1	T2	T3	T4
Color	5.24	5.53	5.89	6.29
Texture	5.83	6.03	6.04	6.29
Taste	5.17	5.44	5.44	6.10
Flavor	5.91	5.49	5.78	6.10
Odor	5.32	5.61	5.69	5.96

α= 0.05 level of significance; Means of the same subscript are comparable

For general Acceptability, T4 has the highest mean rating, 6.12 which is described as "too appealing". This means that T4 is moderately acceptable. However, T3 with its mean rating of 5.77 is comparable to T4. This implies that T3 is also "moderately acceptable" and its acceptability is likely the same as that of T4. It can also be noted that T2 has a mean rating of 5.62 which is described as "too appealing", and is comparable to that of T3 but more different from that of T4.

An enriched food is a product to which nutrients have been added. Typically, the added nutrients were present in the food in its original form but were removed at some point during processing. White bread is an example of an enriched food because certain vitamins are added after the bleaching process depletes them. Examples: Pasta

made with enriched white flour is an enriched food. What Are Enriched Foods? Enriched foods sound healthy, don't they? The word "enriched" makes it seem like something special has been added to the food to make it better. That definition of enriched foods isn't wrong. But it's not completely accurate either.

Many enriched foods have had ingredients removed and then added back in. For example, food makers may add B vitamins or iron that was lost during the food manufacturing process. Many people confuse enriched foods with fortified foods. According to the University of Chicago, fortified foods are foods in which nutrients have simply been added, not replaced (Jennifer R. Scott December 15, 2015).

Shelf-Life Analysis

In evaluating the shelf-life of the rice-mongo curls enriched with Squash (Cucurbita maxima) the researcher stored four (4) packs of the product for each treatment. The rice-mongo curls were stored at room temperature. Every week, they were tested and rated by the researcher and by the respondents based on the Sensory Evaluation in terms of color, texture, flavor, taste, and odor. The shelf-life testing was done for four (16) weeks and observations were recorded.

During the first, second, third, and fourth weeks of observation, there were no changes observed in the color, texture, flavor, taste, and odor of products from all the treatments.

Physico-Chemical Analysis

Table 8. Proximate composition of the developed rice-mongo curls with squash (Cucurbita *maxima*)

Parameter	Result	Unit
Moisture Content	5.84	%(g/100g)
Total Solid*	94.16	%(g/100g)
Water Activity*	0.56	-------
Crude Fat	7.12	%(g/100g)
Sodium	101.91	Mg/100g

Based on the report analysis of the Physio-chemical analysis shown the test method, parameter, result of the rice mongo curls enriched with Squash (Cucurbita maxima).

It reveals on physio-chemical analysis that t the product is not risky to the health of consumers; therefore, the product is safe for consumption.

SUMMARY

This study entitled "Organoleptic Profile of Rice-Mongo Curls Enriched with squash (*Cucurbita Maxima*)" was conducted at the Regional Communal Processing Center, SKSU – Isulan Campus on October 24, 2016.

The study aimed to improve the rice-mongo curls with Cucurbita maxima and to determine their sensory qualities in terms of color, texture, taste, flavor, and odor, as well as the quantitative quality attributes of the products in terms of the shelf-life, nutrient, and microbial analysis as well as their suitable and appropriate packaging materials.

In the evaluation of the treatments, questionnaires were used for sensory evaluation. Rating scale from 1 - 7 was used to judge the sensory qualities of the products, seven (7) being the highest value and one (1) for the lowest rating. Results of the sensory evaluation were statistically analyzed and interpreted.

Results of the sensory evaluation were statistically analyzed using the variance of Completely Randomized Design (CRD) with four (4) treatments replicated three (3) times.

To determine the significant differences among treatments, the Analysis of Variance (ANOVA) was used.

The summary of the findings noted the following results:

In terms of color, a highly significant difference among treatments was obtained. Treatment 4 was the most preferred by the panel of evaluators with the highest mean rating of 6.29, and described as "very much too appealing".

The texture of the developed product showed a highly significant difference among the treatments. Treatment 4 obtained the highest mean rating of 6.13, described as "very much too crunchy".

A highly significant difference was also observed among treatments in the evaluation of taste. The highest mean rating of 6.10 was obtained by Treatment 4, described to have a "too palatable" taste.

The flavor of the developed product showed a highly significant difference among treatments. Treatment 4 obtained the highest mean rating of 6.10, described as a "slightly too delicious" flavor.

As to odor or aroma, a significant difference among treatments was also observed. Treatment 4 obtained the highest mean rating of 5.96, described to have a "slightly too pleasant" odor or

aroma.

When it comes to the general acceptability of the developed product Treatment 4got the highest mean, in all sensory qualities, color 6.29, texture 6.13, taste 6.10, flavor 6.10, and color or aroma 5.96.

The study with the title "Organoleptic Profile of Rice-Mongo Curls Enriched with squash (Cucurbita maxima)" was observed to have no sign of spoilage from the date of processing, October 24, 2016, up to February 15, 2017.

Based on the results of its nutrient analysis Report Fromm DOST Department of Science Technology, the product showed 5.84% of moisture content based in the unit of %(g/100g), 94.16% of total solid, using the same unit of measurement used, 0.56% of water activity, 7.12% of crude fat, and 101.91% of sodium in (mg/100g).

As to its cost and return analysis or the actual yield of the product, the higher net income and ROI were realized when there was a higher percentage of production. Treatment 3 obtained the highest ROI of 68.48%

CONCLUSION

The findings of this study indicate a positive perception by the panel of evaluators on Treatment (4) with six (6) kilos of rice-flour, four (4) kilos of mongo-flour, one (1) Tbsp. of oil, and five hundred (500 grams) of water of the rice-mongo curls enriched using Squash (Cucurbita maxima) which was the most accepted treatment but Comparable to Treatment three (3) with six (6) kilos of rice-flour, four (4) kilos of mongo flour, one (1) Tbsp of oil, five hundred (500) grams of water, and One hundred (100) grams of squash-flour.

RECOMMENDATION

Based on the findings of the study, the following recommendations are considered: Further study on the treatment three (3), Using of the other raw materials as enrichment to the products, and it is recommended that the product be sold in school canteens, for commercialization, and to be given to those children undernourished as well as to be included in a feeding program for children in school-community or even in wider areas of the province.

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ALTERNATIVE LEARNING SYSTEM: ITS EFFECT ON THE PERSONS DEPRIVED OF LIBERTY'S ACADEMIC PERFORMANCE

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ABSTRACT

This research was conducted to determine the effect of Alternative Learning System (ALS) to the Persons Deprived of Liberty's (PDLs) Academic Performance. Respondents of the study were the 12 PDLs who are in high school level, and 9 PDLs who are in elementary level. A researcher-made 60- item tests were constructed based on the ALS competencies for the six strands. The research instruments were validated by the subject experts and Department of Education (DepEd)- ALS coordinators. Pre and post assessment were conducted as data gathering technique. Descriptive statistics such as frequency, and mean were utilized, while t test for dependent samples was used for inferential statistics. High school level results showed that there are significant differences in the pre and post test in Communication Skills (t(11)=3, p=0.012),and Understanding the Self and Society (t(11)=2.57, p=0.026). However, no significant differences in Mathematical and Problem Solving Skills (t(11)=1.63,p=0.131), Life and Career Skills (t(11)=1.08,p=0.305), Scientific Literacy (t(11)=1.16, p=0.269), and Digital Literacy (t(11) =0.56,p=0.586). For the elementary level, there was a significant difference in the Communication Skills Strand (t(8)=3.86,p=0.004), while no significant differences was noted in Mathematical and Problem Solving Skills (t(8)=1.46,p=0.177), Life and Career Skills (t(8)=0,p=1), Scientific Literacy (t(8)=1.08, p=0.312),Digital Literacy (t(8)=1.89,p=0.095), and Understanding the Self and Society (t(8)=1.67,p=0.133) . From this, respondents were not able to grasp concepts discussed due to limited time allotted per strand and irregular schedule of classes. Subject specialists are needed for effective delivery and transfer of knowledge. Hence, the community should further consider providing appropriate and adequate support such as educational technologies for the learners behind bars.

Keywords: Academic, Alternative, Deprived, Effect, Learning, Liberty, Performance, Person's

INTRODUCTION

Crime rates all over the world continue to increase significantly involving less educated persons as offenders (Hjalmarsson & Holmlund, 2014). For the 18 year old population in 1997, 41% of Persons Deprived of Liberty (PDLs) had not completed high school (Harlow, 2003), and an alarming increase of more than 75% in 2001 (Buonanno and Leonida, 2006). In the Philippines, the highest percentage of PDLs with 14.97% in every 1,000 PDL population is only in elementary level (Statista, 2021).

Taking major consideration of the relationship between education and crime rates, there is a need to reemphasized "The Universal Declaration of Human Rights of 1948 recognized education as the ultimate key of unlocking and protecting other human rights by providing the platform that is needed to secure the total well-being of every individual" (UN,2002). Moreover, the United Nations established the 2030 Sustainable Development Goals (SDGs) which is a collection of 17 interlinked goals, and number 4 of which is education that will see to it that everyone could avail equitable quality education and be able to experience lifelong learning opportunities. This declaration paved way to the rights-based discourse of education to be asserted by the marginalized group like the Persons Deprived of Liberty (PDLs).

The Philippine government's commitment and support in lowering crime rates and achieving the United Nations SDGs and UNESCO's

"Education for All" (EFA) goals is reflective on the Department of Education's Alternative Learning System (ALS) program that extended the delivery of education to the Persons Deprived of Liberty (PDLs). The ALS program combines non-formal education and accreditation and equivalency (A&E) that grants elementary or high school diploma. ALS specifically targets the learning needs of PDLs (Arzadon & Nato, 2015) focusing on the six academic strands such as communication skills in both English and Filipino, Scientific literacy and Critical Thinking Skills, Mathematical and Problem Solving Skills, Life and Career Skills, Understanding the Self and Society, and Digital literacy.

Chavez (2018) stated that there are 7,141 PDLs in the country have availed the Alternative Learning System. In the Dumangas District Jail (2018), there are 21 PDLs who are enrolled in ALS of which 12 are in high school level and 9 are in elementary level. Reports show that A & E passing rate has been steadily increasing from 9% in 2000 to 21% in 2006 (Caoli,2007), the passing rate peaked in 2013 at 28% but the figure was not sustained (Arzadon & Nato, 2015). Hence, this study was conducted to determine the effect of ALS to the Persons Deprived of Liberty's academic performance.

Statement of the Problem/Objectives

This study was conducted to determine the effect of Alternative System's to the Persons Deprived of Liberty's Academic Performance. Specifically it sought to answer the following questions: 1).What are the academic performance of the respondents before and after the intervention when classified as to strand?; 2). Are there any significant differences in the mean performance scores of the respondents before and after the intervention when classified as to strand?

Materials and Methods

This study started after several meetings, discussions, deliberations, finalizations of assignments and signing of the Memorandum of Agreement between the different agencies involved such as the Bureau of Jail Management and Penology- Dumangas District Jail (BJMP-DDJ), the Local Government Unit of Dumangas, the Department of Education-Dumangas District II and the Iloilo State College of Fisheries-Dumangas Campus.

The study was conducted at Bureau of Jail Management and Penology-Dumangas District Jail. 21 DDJ PDLs were the respondents of the study, 12 are high school levels and 9 are elementary levels. The Local Government Unit of Dumangas was in charge of creating a Job Order to hire a licensed teacher to serve as ALS facilitator for the PDLs during the study period. The Department of Education Dumangas District II was in charge of the PDLs assessment to determine their academic level, orientation, assessment, training of LGU hired ALS facilitator, submission of reports to the Department of Education-ALS, provisions of ALS modules. The Iloilo State College of Fisheries-Dumangas Campus was in charge of the conduct of this study, developed, sought validation of a parallel assessment instrument used during the pre and post-test, monitoring of ALS classes, and provided school supplies for PDLs.

A researcher-made 60- item tests (10 items per strand) were constructed based on the ALS competencies for the six strands, and reflecting on the DepEd-ALS assessment tools. The research instrument was validated by the subject experts and DepEd ALS coordinators. After the assessment tool was approved, schedule of classes were set following that PDLs elementary level had classes every Tuesday and Thursday, 8:00 am - 11:00a.m., and PDLs high school level had classes every Wednesday and Friday, 8:00 am- 11:00 a.m. with the same teacher, and learning venue. Classes lasted for nine months.

Pre and post assessment were conducted as data gathering technique. Descriptive statistics such as frequency, and mean were utilized. While t test for dependent samples was used for inferential statistics. The four level scale was used to identify the level of the academic performance of the respondents based on the mean yielded for each strand with a description of "Outstanding", "Average", "Poor", "Very Poor".

Legend:

Scale	Description
7.51 - 10	Outstanding
5.01 - 7.50	Average
2.51 - 5.00	Poor
0 - 2.50	Very Poor

RESULTS AND DISCUSSION

High school level PDLs result showed that the academic performance of the respondents before the intervention were "average" on the three strands such as Communication Skills with a mean of 5.6, Understanding the Self and Society with a mean of 5.13 and Life and Career Skills

with a mean of 5.02, while the respondents performed "poor" on the Mathematical and Problem Solving Skills with a mean of 3.07, Scientific Literacy with a mean of 4.19, and Digital Literacy with a mean of 4.77.

Table 1 shows the results.

Table 1. Academic Performance of the Respondents before the Intervention when Classified as to Strand Academic Performance (High School Level)

Strand	x_1	Description
Communication Skills	5.6	Average
Understanding the Self and Society	5.13	Average
Mathematical and Problem Solving Skills	3.07	Poor
Life and Career Skills	5.02	Average
Scientific Literacy	4.19	Poor
Digital Literacy	4.77	Poor

Furthermore, high school level PDLs result showed that the academic performance of the respondents after the intervention were " above average" on the three strands such as Communication Skills with a mean of 7.4, Understanding the Self and Society with a mean of 6.79 and Life and Career Skills with a mean of 6.13, while the respondents performed "average" on the Mathematical and Problem Solving Skills with a mean of 4.32, Scientific Literacy with a mean of 5.26, and Digital Literacy with a mean of 5.33.

Table 2 shows the results.

Table 2. Academic Performance of the Respondents after the Intervention when Classified as to Strand Academic Performance (High School Level)

Strand	x_2	Description
Communication Skills	7.4	Above Average
Understanding the Self and Society	6.79	Above Average
Mathematical and Problem Solving Skills	4.32	Average
Life and Career Skills	6.13	Above Average
Scientific Literacy	5.26	Average
Digital Literacy	5.33	Average

Elementary level PDLs result showed that the academic performance of the respondents before the intervention were "poor" in the six strands: Communication Skills with a mean of 4.92, Understanding the Self and Society with a mean of 3.87, Life and Career Skills with a mean of 4.52, Mathematical and Problem Solving Skills with a mean of 2.66, Scientific Literacy with a mean of 3.09, and Digital Literacy with a mean of 3.04.

Table 3 shows the results.

Table 3. Academic Performance of the Respondents before the Intervention when Classified as to Strand Academic Performance (Elementary Level)

Strand	x_1	Description
Communication Skills	4.92	Poor
Understanding the Self and Society	3.87	Poor
Mathematical and Problem Solving Skills	2.66	Poor
Life and Career Skills	4.52	Poor
Scientific Literacy	3.09	Poor
Digital Literacy	3.04	Poor

Moreover, the academic performance of the respondents after the intervention improved slightly, performing "average" on Communication Skills with a mean of 6.83, and in Life and Career Skills with a mean of 5.07, while the respondents though an increase in mean was observed but still performed "poor" on Understanding the Self and Society strand with a mean of 4.51, Mathematical and Problem Solving Skills with a mean of 3.29, Scientific and Literacy with a mean of 4.68, Digital Literacy with a mean of 4.05.

Table 4. Academic Performance of the Respondents after the Intervention when Classified as to Strand Academic Performance (Elementary Level)

Strand	x_1	Description
Communication Skills	6.83	Average
Understanding the Self and Society	4.51	Poor
Mathematical and Problem Solving Skills	3.29	Poor
Life and Career Skills	5.07	Average
Scientific Literacy	4.68	Poor
Digital Literacy	4.05	Poor

For the inferential analysis, in High School level there are significant differences in the mean performance of the respondents test in Communication Skills ($t(11)=3$, $p=0.012$),and Understanding the Self and Society ($t(11)=2.57$, $p=0.026$). However, no significant differences have been noted in Mathematical and Problem Solving Skills ($t(11)=1.63$,$p=0.131$), Life and Career Skills ($t(11)=1.08$,$p=0.305$), Scientific Literacy ($t(11)=1.16$, $p=0.269$),Digital Literacy ($t(11)=0.56$,$p=0.586$).

Table 5 shows the result.

Table 5. t test Results on Effect of Alternative Learning System on Persons Deprived of Liberty's Academic Performance (High School Level)

Strand	df	t	p	Remarks
Communication Skills	11	3	0.012	sig.
Understanding the Self and Society	11	2.57	0.026	sig.
Mathematical and Problem Solving Skills	11	1.63	0.131	not sig.
Life and Career Skills	11	1.08	0.305	not sig.
Scientific Literacy	11	1.16	0.269	not sig.
Digital Literacy	11	0.56	0.586	not sig.

For the elementary level PDLs, there was a significant difference in the Communication Skills Strand (t(8)=3.86,p=0.004). However, no significant differences was noted in Understanding the Self and Society (t(8)=1.67, p=0.133), Mathematical and Problem Solving Skills (t(8) =1.46,p=0.177), Life and Career Skills (t(8) =0,p=1), Scientific Literacy (t(8)=1.08, p=0.312),Digital Literacy (t(8)=1.89,p=0.095).

Table 6 shows the results.

Table 6. t- test Results on the Effect of Alternative Learning System on Persons Deprived of Liberty's Academic Performance (Elementary Level)

Strand	df	t	p	Remarks
Communication Skills	8	3.86	0.004	sig.
Understanding the Self and Society	8	1.67	0.133	not sig.
Mathematical and Problem Solving Skills	8	1.46	0.177	not sig.
Life and Career Skills	8	0.00	1	not sig.
Scientific Literacy	8	1.08	0.312	not sig.
Digital Literacy	8	1.89	0.095	not sig.

CONCLUSION

The Persons Deprived of Liberty availing the Alternative Learning System both in High School and elementary levels, majority performed poorly in most of the academic strands. The teaching of ALS is a multi-grade approach which affects and pose great challenge in the delivery and acquisition of knowledge. English as the medium of instruction and assessment is a struggle for every PDL, the reason that many of the respondents were not able to thoroughly comprehend the concepts presented. In addition, PDLs spent only 216 hours in 9 months of study time compared to the minimum 800 hours class time set by the Department of Education for ALS students, this was due to the bureau's restrictions and internal policies.

RECOMMENDATIONS

It is recommended that the bureau should include a learning facility to serve as the appropriate venue for ALS classes. Subject specialists shall be considered in hiring the ALS facilitator for effective delivery and transfer of knowledge. Periodic monitoring and evaluation shall be conducted to determine the progress of every ALS student. The local government unit should put into consideration the support needed by the bureau for the educational welfare of the PDLs such as educational technologies, and relative trainings for the facilitators, personnel and above all for the learners behind bars.

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DEMOGRAPHIC PROFILE, POLITICAL CYNICISM AND POLITICAL PARTICIPATION OF VOTERS IN NEGROS ORIENTAL, PHILIPPINES

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ABSTRACT

This was a correlational study designed to test the relationship between demographic profile, political cynicism, and the political participation of voters in Negros Oriental, Philippines. An overall population of 400 registered voters participated in this study. There are six variables under political cynicism such as self-interest, dishonesty, untrustworthiness, being out-of-touch, incompetence, and immorality. On the other hand, there are two indicators for political participation: electoral and political voice. The demographic profile of the respondents cannot directly affect the political cynicism and political participation of voters. The study points out that there is a significant relationship between political cynicism and political participation, and they are inversely related. The more politically cynical the voters, the less they were interested in participating in politics. The higher the perception of the self-interest, dishonesty, untrustworthiness, being out-of-touch, incompetence, and immorality of politicians, the less likely the voters in Negros Oriental participated in terms of "electoral" and "political voice". The result may be used as basis for an extension program of the institution, with the objective of educating the voting public. The result is given to Department of Interior and Local Government (DILG), or basis for the conduct of capability training-workshop of LGU officials.

Keywords: Political Cynicism, Political Participation, Demographic Profile, Voters, Negros Oriental

INTRODUCTION

Distrust and doubt with the government is common in the Philippines. Arguments over the antecedents and effects of cynicism stem from different measures and interpretations (Erber and Lau, 1990; Hetherington, 1998). Political cynicism is both rising and pervasive in the Western world. The notion that the current era is one that is particularly cynical is even evident in scholarly work. Political scientists, psychologists, and sociologists state that we live in an "age of cynicism" and that there is a "fog of cynicism" surrounding politics. They speak of cynicism as the "single most pressing challenge" (Goldfarb, 1991) and the present time as "the season of our national contempt" (Chaloupka, 1999, p. xiii).

The measures of political cynicism in this study relate to questions about its consequences for political participation. Most scholars claim that it is important to study political cynicism since it is assumed to have detrimental effects on political participation.

Furthermore, it has become increasingly accepted that broad participation in decision-making processes is a prerequisite for proper democratic governance (Dahl 1971, 1998, Pateman 1970, Easton 1965).

Generally this growing cynicism is evaluated negatively. The worry is that growing political cynicism among citizens will produce obstruction of democratic deliberation, rejection of civic responsibilities, a growing support for populist or protest parties, or in the absence of this kind of parties, a lower electoral turnout. It will therefore be a threat to democracy (Dalton, 2004).

There is little empirical evidence supporting the assumption that cynicism in itself is detrimental to political participation. In fact, cynicism might even be a reflection of an interested and critical public stance (De Vreese and Semetko, 2002; Pederson, 2012).

Unfortunately, there are many indicators of growing political cynicism among citizens in the Philippines that can affect their political participation.

In this study there are six indicators for political cynicism these are self-interest, dishonesty, untrustworthiness, being out-of-touch, incompetence and immorality. And the two indicators for political participation such as electoral and political voice. Hence, this study was conducted to test the relationship between the demographic profile and the political cynicism of voters; the relationship between the demographic profile and political participation of voters. Specifically, it sought to find out the relationship between the political cynicism and political participation of voters.

The above rationale points to the main cause of why the political cynicism of voters affects political participation, and so, to address the problem the study has been conducted. The findings of the study will be used be used as basis for an extension program of NORSU-Guihulngan, with the objective of educating the voting public. And also to Department of Interior and Local Government (DILG), or basis for the conduct of capability training-workshop of LGU officials.

STATEMENT OF THE PROBLEM

The study of political cynicism and political participation thus remains an assumption-driven practice. To understand the effect of political cynicism on political participation of voters, it is necessary to first properly define and measure political cynicism.

The main goal of this study is to test the relationship between political cynicism and political participation of voters in Negros Oriental, Philippines. In this regard, there are six dimensions of political cynicism; its six underlying dimensions are latent constructs that are based on several observable indicators. Moreover, the demographic profiles of the respondents according to sex, age, religion, marital status, educational attainment, and income have first to be established to explain the extent of their political cynicism and political participation.

To answer the major research problem, the following research questions were investigated:

1. Is there a significant relationship between the demographic profile and the political cynicism of voters in terms of the six variables under political cynicism such as self-interest, dishonesty, untrustworthiness, being out-of-touch, incompetence, and immorality?
2. Is there a significant relationship between the demographic profile and political participation of voters?
3. Is there a significant relationship between the political cynicism and political participation of voters?

METHODOLOGY

This was a correlational study of the relationship between the demographic profile and political cynicism as well as demographic profile and political participation of voters. Likewise, it will also look into the relationship between political cynicism and participation.

The study was conducted in the cities and municipalities of Negros Oriental. The 400 sampled voters of Negros Oriental were proportionately distributed and randomly identified in 6 cities and 19 municipalities. The respondents were well represented by the different barangays of each city and municipalities to avoid bias and inconsistency of the result.

Letters were presented to the respondents for the conduct of the study and its purpose. The Commission on Elections (Comelec) also provided the researcher with a certification of data privacy for the respondents. Additionally, respondents were well-acquainted with the study's objectives and purposes and had the prerogative of free choice, enabling them to consent or decline participation voluntarily.

The data-gathering instrument was a researcher-made questionnaire. The data collected were analyzed using percentage distribution, Pearson Product Moment r, Chi square test of independence and Spearman rho. Percentage distribution was used in presenting the distribution of the respondents across categories. Pearson Product Moment r was employed so as to determine the extent of relationship between age and extent of political cynicism and participation. The same instrument was used in determining whether or not a significant relationship existed between income and political cynicism and political participation. Chi square test of independence was used in ascertaining the degree of relationship between sex, marital status, religion, educational attainment and political cynicism as well as political participation. Moreover, Spearman Rho was employed in ascertaining if a significant relationship existed between the extent of political cynicism and participation. In all the correlational analyses, the

level of significance was at 0.05.

The researcher applied for an ethics review to the University Research Ethics Committee and submitted a copy of the proposal to the UREC Chair or Secretary for the review of the proposal. The Commission on Elections (Comelec) also provided the researcher with a certification of data privacy for the respondents. Additionally, respondents were well-acquainted with the study's objectives and purposes and had the prerogative of free choice, enabling them to consent or decline participation voluntarily.

FINDINGS

Demographic Profile of the Respondents

Sex	Frequency	Percentage
Female	254	63.50
Male	146	36.50
Total	**400**	**100.00**
Age		
18-19	20	5.00
20-25	76	19.00
26-64	297	74.25
≥ 65	7	1.75
Total	**400**	**100.00**
Religion		
Roman Catholic	278	69.50
Aglipay	37	9.25
Baptist	29	7.25
Protestant (UCCP)	24	6.00
Iglesia	17	4.25
Others	15	3.75
Total	**400**	**100.00**
Marital Status		
Married	229	57.25
Single	149	37.25
Widow/er	17	4.25
Separated	5	1.25
Total	**400**	**100.00**
Educational Attainment		
Elementary Level	38	9.50
Elementary Graduate	43	10.75
High School Level	41	10.25
High School Graduate	69	17.25
College Level	103	25.75
College Graduate	99	24.75
Post College	7	1.75
Total	**400**	**100.00**
Income (PH pesos/month)		
Less than 9,520 pesos	222	55.50
Between 9,520 to 19,040 pesos	119	29.75
Between 19,040 to 38,080 pesos	42	10.50
Between 38,080 to 66,640 pesos	6	1.50
Between 66,640 to 114,240 pesos	7	1.75
Between 114,240 to 190,400 pesos	2	0.50
At least 190,400 pesos	1	0.25
Not indicated	1	0.25
Total	**400**	**100.00**

As delineated in the table, the female respondents take preponderance outnumbering their male counterparts. It is also shown that a sheer number of them are in their adulthood, indicating that they are at the stage where consideration for other people's welfare is of prime concern as Erik Erikson emphasized in his theory. This is important as this can be related to their choice of candidates whose management style will inevitably affect the lives of the younger generations. The respondents were distributed among the different religious denominations, namely Roman Catholic, Aglipay, Baptist, Protestant, Iglesia and others with the first having the most. This distribution does not come as a surprise, the Philippines being a Catholic country after having been influenced by the Spaniards for more than three centuries.

Considering that the majority of the respondents were in their adulthood phase it does not come as a surprise that most of them are already married. It is not as well astonishing to note that most of them put premium on education, as majority of them are clustered in the college level and college graduates categories respectively. In terms of income, a greater number of them are in the lower economic brackets. The profiles are not only being provided to give the readers background information about the respondents, but also to shed light on whether or not such play a significant role in influencing their decisions in the selection of candidates during elections. The results are shown in Tables 10 to 28.

The indicators of demographic profile of voters determine social roles that people play and pose social expectations for participation. These variables are also linked to exposure to political communication and political stimuli. These are then linked to political interest and desire for involvement. And socioeconomic status can affect the stakes citizens have in certain political outcomes (e.g. lower income citizens desire different outcomes than high income citizens). Time after time, studies have shown that citizens who are advantaged in socioeconomic terms such as education, income and occupation are more likely to be active (Conway, 2000; Verba, Schlozman and Brady, 1995).

Citizens with a higher social economic status (SES) are more likely to vote. Often, there are particular characteristics of non-voters such as having a lower level of education, and therefore a low-status occupation and accompanying low income. There is a normative assumption that high levels of participation are good for democracy and political representation (Crotty, 1991)

Relationship between Sex and Political Cynicism

At the outset it can be deduced that it cannot be categorically said that political cynicism and sex are significantly related.

On the other hand, dishonesty, untrustworthiness and being out-of-touch happened to be significantly related to sex. This being the case requires looking into the specific details behind the established relationship. Such scrutiny led to the determination that the female respondents have a higher rating compared to the male. This meant that females are more inclined to believe the notion that politicians are primarily motivated by personal interest rather than serving the people. In other words, they are more skeptical, that is, believe that politicians are dishonest, untrustworthy and out-of-touch. A recent study suggests that men show more participation through traditional forms of political participation (Gregory, 2016). These include joining political parties, actively consuming media information regarding politics, engaging in political discussion, and donating more money in campaigns (Gregory, 2016). Meanwhile, women posed atypical forms of political participation. When compared to men, women were found more likely to vote (Carroll, 2014; Gregory, 2016).

Relationship between Age and Political Cynicism

The results imply that the higher the age of the respondents the higher their belief that politicians are motivated with self-interest, they are untrustworthy and out-of-touch after elections. They are mainly in politics for personal benefit for themselves and family and not for the benefit of the community (Marsh, 1990), and are concerned with winning and enriching themselves (Cappella & Jamieson (1997). They only care about themselves or their special interests and not the condition or welfare of the people (Pinkleton & Austin, 2002), and consciously promise more than what they can deliver (Adriaansen, van Pragg & de Vreese, 2010). Politicians lie to the media and the public to deceive voters to vote for them, and are not sincere (Craig, Niemi & Silver, 1990), and lose touch with the people once they are elected (Pinkleton, Um & Austin, 2002).

Erikson (1950) in his book on Psychosocial Development Stages asserts that the age of voters 26-64 years old are in the stage of Generativity vs Stagnation. This is the stage where they would create or nurture things that will outlast them, either by having children or creating a positive change that benefits others. They are also conscious in giving and caring-putting something into life, to the best one's capabilities.

On the other hand, views on politicians' dishonesty, incompetence and immorality happen to be not significantly related to age. This implies that age does not affect the rating of the respondents. This is disclosed in the high correlation coefficient of the combined ratings of the six components of cynicism, such as self -interest, dishonesty, untrustworthiness, out-of-touch, incompetence and immorality and age with a p value of 0.024. For the two variables to have a significant relationship, the p value needs to be equal to or lesser than the margin of error or alpha which in this study set at 0.05.

Relationship between Religion and Political Cynicism

The rest of the indicators: political cynicism, self-interest, dishonesty, untrustworthiness, incompetence and immorality have a low correlation coefficient of the combined ratings with a p value of 0.200. The notion of a "politics of religion" refers to the increasing role that religion plays in the politics of the contemporary world and the consequences that a politics of religion has on inclusive nation-building, democracy, and human rights. The involvement of religious groups in Philippine politics is not new, Balbuena (2016).

Relationship between Marital Status and Political Cynicism

Only out-of-touch is significantly related to marital status and the five remaining indicators for political cynicism are not significant to marital status. This implies that the voters are observant about the commitments of the politicians after the elections but their marital status does not make them view politicians negatively. According to Plissner (1983), married people are more apt to have made political commitments in the prevailing order that extend beyond the self. These commitments may be material but also include such intangible matters as attachments to social values and community. Married life – the socially conventional life for adults may reflect or even create a preference for order and stability in one's domestic life, and this preference maybe transferred to the political realm.

The combined ratings of the six components of cynicism, such as self -interest, dishonesty, untrustworthiness, out-of-touch, incompetence and immorality and marital status have a p value

of 0.562. For the two variables to have a significant relationship, the p value needs to be equal to or lesser than the margin of error or alpha which in this study set at 0.05.

Relationship between Educational Attainment and Political Cynicism

The variables under political cynicism such as dishonesty, untrustworthiness and out-of-touch are significant to the educational attainment of the voters. The higher the educational attainment, the more politically cynical the voters are in more view it as dishonest, untrustworthy and out-of-touch with the problems of constituents. According to Howard and Jones (2004), education remains one of the significant predictors of political behavior. Individuals are situated in different educational settings, and the effects of formal education may be modified according to the particular environment to which an individual belongs. The implication is that the impact of education at the individual level may depend on the level of education in the environment, Pearson (2013, p. 693).

On the other hand, self-interest, incompetence and immorality are not significant to the educational attainment of the voters. Said voters are not cynical toward candidates on basis of self-interest, incompetence and immorality. The combined ratings of the six components of cynicism, such as self -interest, dishonesty, untrustworthiness, being out-of-touch, incompetence and immorality and educational attainment have a p value of 0.261. For the two variables to have a significant relationship, the p value needs to be equal to or lesser than the margin of error or alpha which in this study set at 0.05. From the perspective of, Nie et.al. (1996), well-educated individuals are positioned within networks that increase their probability of being mobilized for political activities. The results imply that well-educated individuals will have a greater stake in policy outputs and are thus rationally more inclined to engage in political affairs.

Relationship between Income and Political Cynicism

The respondents' income and the two indicators of political cynicism that are self-interest and untrustworthiness are significantly related. This implies that the higher the income of the voters the higher their rating of self-interest and untrustworthiness as traits of politicians. But they continue to have relative favourable view of politicians on basis of the other variables. The indicators of the demographic profile of voters reflect the social roles they play and their social expectations for participation. Studies also link these variables to exposure to political communication and political stimuli. These are then linked to political interest and desire for involvement. And socioeconomic status can affect the stakes for citizens of certain political outcomes (e.g. lower income citizens' desire different outcomes than high income citizens). Time after time, studies show that citizens who are advantaged in socioeconomic terms such as education, income and occupation are more likely to be active (Conway, 2000; Verba, Schlozman and Brady, 1995).

On the other hand, dishonesty, being out-of-touch, incompetence and immorality are showing to be not significantly related to income. The combined ratings of the six components of cynicism, such as self -interest, dishonesty, untrustworthiness, out-of-touch, incompetence and immorality and income have a p value of 0.014. The two variables: income and political cynicism have a significant relationship because the p value is lesser than the margin of error or alpha which in this study is set at 0.05.

Relationship between Sex and Political Participation

The data show the relationship between the sex and political participation of voters. The data suggest that existing sex differences in political participation suggest that men are more active in politics than women. This is suggested also by Gregory, 2016. According to Gregory (2016), gender is a significant predictor of political involvement because there are existing sex differences when it comes to comparing men and women. According to Phillips (1991), sex is worthy to study since men and women have different patterns of behavior in terms of political engagement.

Going back to the raw data it came out that the mean rating of the male respondents (0.64) is 0.11 greater than that of their female (0.53) counterpart. Such difference is significant as indicated by the p value which is lesser that the alpha.

Relationship between Age and Political Participation

There is no significant relationship between the age and political participation of voters. This implies that regardless of the age of the respondents it cannot affect their political participation. According to Turcotte, 2015, regardless of age, those who were the most interested in politics were very likely to vote.

Relationship between Religion and Political Participation

There is no significant relationship between marital status and political participation of voters. The combined ratings of electoral and political voice and marital status with a p value of 0.294. For the two variables to have a significant relationship, the p value needs to be equal to or lesser than the margin of error or alpha which in this study set at 0.05. This implies that marital status does not have any significant effect on the political participation of voters.

Relationship between Educational Attainment and Political Participation

The electoral variable is significantly related to the educational attainment of voters. The implication is that the higher the educational attainment of the voters the higher or the more their participation is in the electoral process. Voting during elections specifically has a priority among respondents. Myriad studies report that education positively correlates with political participation (e.g., Nie, Junn, and Stehlik-Barry, 1996). Educational attainment is, in fact, the single most potent predictor of an adult's political activity, Verba et.al. (2003). This positive relationship is interpreted to mean that education confers participation-enhancing benefits, be it the acquisition of cognitive abilities that enable comprehension of political content, the development of civic skills and civic orientation that foster political action, or attainment of socio economic status positions that facilitate mobilization in participation, Mann (1987). Citizens who are more educated are more able and willing to interact with the political system.

On the other hand the variable political voice is not significantly related to educational attainment. The combined ratings of electoral and political voice and educational attainment with a p value of 0.512. For the two variables to have a significant relationship, the p value needs to be equal to or lesser than the margin of error or alpha which in this study set at 0.05. This implies that educational attainment is not a factor in voter participation in terms of expressing "political voice".

Relationship between Income and Political Participation

There is a significant relationship between the income and political voice of voters. The combined ratings of the two variables, electoral and political voice, in relation to income, has a p value of 0.013. The two variables have a significant relationship because the p value is lesser than the margin of error or alpha which in this study set at 0.05. But on the other hand, the "electoral' variable and income are not significantly related to each other.

Citizens with a higher social economic status (SES) are more likely to vote. Often, non-voters have characteristics, such as having a lower level of education, and therefore a low-status occupation and an accompanying low income. There is a normative assumption that high levels of participation are good for democracy and political representation (Crotty, 1991). Political participation is a constituent check on government and is considered a part of democratic processes.

Relationship between Self-Interest and Political Participation

There is a significant relationship between perception of self-interest and political participation. It is also noted that the relationship that exists is inverse as indicated by the negative sign which precedes the coefficient of correlation. This shows that the higher the voters' belief that the politicians are mainly motivated by self-interest, the lower is their political participation. And this is in consonance with Huntington's and Nelson's (1976), perspective that to voters who are cynical regarding "self-interest," participation is not obligatory; no one is forced to volunteer, and the action receives no pay or only token financial compensation.

Relationship between Dishonesty and Political Participation

There is a significant relationship between perception of dishonesty and political participation. It is also noted that the relationship that exists is inverse as indicated by the negative sign which precedes the coefficient of correlation. This suggests that the higher the voters' belief that the politicians are dishonest, the lower is their political participation. And this is in consonance with Citrin's (1974), which pointed out the politically cynical would be more likely, than those who trust the government, to either withdraw from political activity altogether or to engage in non-customary, sometimes illegal, activities such as participating in sit-ins or riots, or organizing for revolution.

Relationship between Untrustworthiness and Political Participation

The data reveal that there is a significant relationship between "untrustworthiness" and political participation. It is also to be noted that the relationship that exists is inverse as indicated by the negative sign which precedes the coefficient of correlation. The result suggests that the higher the voters' view of the untrustworthiness of politicians, the less they participated in different political activities. And this is inconsonance with Bowler's, Donovan's and Karp's (2007), perspective that although people may have very little desire to take an active role in policy making, they may feel the need to do so because they do not trust elected officials to act properly.

Relationship between Out-of-Touch and Political Participation

There is a significant relationship between this variable, "out-of-touch", and political participation. And the relationship that exists is inverse as indicated by the negative sign which precedes the coefficient of correlation. This suggests that the higher the voter's belief that politicians are out-of-touch after elections, the lower their political participation. This belief that politicians become "out-of-touch" coincides with those of Pinkleton's, Um's & Austin's (2002), that politicians lose touch with the people once they are elected.

Relationship between Incompetence and Political Participation

There is a significant relationship between the voters' view of politicians "incompetence" and their political participation. The two variables are inversely related as indicated by the negative sign which precedes the coefficient of correlation. This means that the higher the voters' belief that the politicians are mainly incompetent, the lower their political participation. This is in consonance with Thorpe's (2017), perspective that incompetent leadership can mean to voters the erosion of the things that keep a country grinding on day after day. An incompetent leader in a country with wealth and assets to spare may be unable to enforce the laws and the checks and balances that keep a country corruption-free. Incompetence as lack of effectiveness creates scandal, offense, and then a cycle of denial, apology and anger that foments distraction. Perception of the incompetence of politicians will lead to less participation of voters in different political activities.

Relationship between Immorality and Political Participation

There is a significant relationship between the voters perception of politicians' "immorality" and their political participation. The relationship that exists is inverse as indicated by the negative sign which precedes the coefficient of correlation. This suggests that voters manifest less participation in political activities if they see a high degree of immorality among politicians. And this is in consonance with Hubbard's (2017), perspective that people will choose representatives who they believe are guided by principles of benevolence and empathy toward those whom their decisions affect. To voters, both the public and private life of politicians should be moral because their decisions affect their engagements in society. And a citizen's identity and desires can be adopted by a representative who tries to reconcile the disparate wishes of constituents and not be immoral in ruling the government. In the perspective of Moore (2017), electing someone with a history of sexual deviance and hoping that a position of responsibility will transform him has not worked in the past and amounts, at best, to nothing more than an empty gesture of trust.

There is a significant relationship between political cynicism and political participation. However, such relationship is inverse as signified by the negative sign. It implies that the more politically cynical the voters, the less they participated in politics. The higher the perceived self-interest, dishonesty, untrustworthiness, being out-of-touch, incompetence and immorality of the politicians the less the voters in Negros Oriental participated in political behaviour, designated as electoral and political voice. This is in consonance with what Rijfkhoff's (2015) perspective that politically distrusting citizens are less likely to participate in demonstrations or in political activities.

CONCLUSIONS

In view of the findings of the study, the following conclusions are made:

- Females were more inclined to believe the notion that politicians are primarily motivated by personal interests rather than intending to serve the people. In other words, they are more skeptical, believing that politicians are dishonest, untrustworthy and out-of-touch. The higher the age of the respondents the higher their belief that politicians were motivated with self-interest, are untrustworthy and

out-of-touch with the people after elections. And the perception of dishonesty, incompetence and immorality of politicians are seen to be not significantly related to the sex of the respondents. Also, it is seen that age has no effect on the rating of the politicians by the respondents. It appears that religion plays an increasing role in the politics of the contemporary world and the consequences that a politics of religion has on inclusive nation-building, democracy, and human rights is apparent. Education remains a significant predictor of political behavior. Individuals are situated in different educational settings, and the effects of formal education may be modified according to the particular environment to which an individual belongs. The implication was the impact of education at the individual level may depend on their level of education. Well-educated individuals are positioned within networks that increase their probability of being mobilized for political activities. Moreover, it implies that well-educated individuals will have a greater stake in policy outputs and are thus rationally more inclined to engage in political affairs. The higher the income of the voters the higher their belief in the self-interest and untrustworthiness of politicians. Socioeconomic status can affect the stakes for citizens of certain political outcomes (e.g., lower income citizens' desire different outcomes than high income citizens). Studies show that citizens who are advantaged in socioeconomic terms such as education and income are more likely to be politically cynical. The age of the respondents cannot affect their political participation. Regardless of their age, those who were the most interested in politics were very likely to vote or participate in political activities. And the marital status of the voters had no significant effect on their political participation.

- The more politically cynical the voters, the less they were interested in participating in politics. The higher the perception of the self-interest, dishonesty, untrustworthiness, being out-of-touch, incompetence, and immorality of politicians, the less likely the voters in Negros Oriental participated in terms of "electoral" and "political voice".
- People may have a very little desire to take an active role in the process of policy making. They may feel the need to do so only because they do not trust elected officials to act properly. Their sourness toward government does not appear to stem from the fact that they want to be more involved, but from the fact that they feel as though they need to be involved even though they would rather not be.

RECOMMENDATIONS

The following recommendations are worth mentioning:

Further studies to understand the root causes why females are more skeptical in politics compared to men.

As a practice of academic freedom, the results of this study maybe integrated in classroom discussion on a lesson in the General Education course, more specifically Ethics and Governance.

It is recommended that the result maybe used as basis for an extension program of NORSU-Guihulngan, with the objective of educating the voting public.

It is recommended that the result be given to Department of Interior and Local Government (DILG), or basis for the conduct of capability training-workshop of LGU officials, and the researcher as the speaker/ head of the workshop.

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DEVELOPMENT AND EVALUATION OF HYDROPONIC NUTRIENT AND WATER DISPENSER

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ABSTRACT

Over the years, traditional farming with soil use takes longer to decompose, making it prone to diseases and expensive investments. Hydroponics means growing plants without soil with better results, especially in less space and unsuitable environments. This study aimed to develop a device capable of controlling the dispensing of hydroponic nutrient solutions and water for the hydroponic system using an Arduino Mega microcontroller with logical C programming. The HC-SR04 Ultrasonic sensors were used to measure the nutrient solution's level, and the dispensing of nutrients is measured using Peristaltic pumps. The microcontroller sends signals to the relays triggering motor pumps' operation used in the hydroponics system with corresponding time intervals. Resource usage data is stored in the Arduino Mega EEPROM and displayed on a Liquid Crystal Display (LCD) for monitoring purposes. The system was designed and developed using the Evolutionary Prototyping Methodology. This research revealed that the system is very effective in terms of its product quality and quality in use standards that is adaptable and can be used for experimental and developmental research. It was concluded that the prototype was successfully designed, developed, and tested and offered high dosage accuracy and conformed to ISO standards. It is recommended to upgrade and enhance the packaging for indoors and outdoors to utilize its benefits fully and be implemented in all campuses to integrate innovation in farming and provide hands-on training ground for faculty and student researchers. User trainings to the end-users on operating and maintaining the system is also recommended and be implemented correctly with full respect for plant needs, water, environment, users, growers, and farmers' safety to be utilized for mass production. The system aimed to save water, labor costs, improve crops' quality, and save the land.

Keywords: Hydroponics, Nutrient Solutions, Water, Dispenser, Arduino Mega, Ultrasonic Sensor, Peristaltic Pump

INTRODUCTION

Philippine agriculture has always been associated with manual labor and backward traditional farming methods. According to the Department of Agriculture (DA), the stigma of farming being a poor man's job does not make it easier to fulfill its mandate of reaching food security or attracting more people to join the sector. Years ago, both the government and the private sector addressed self-sufficiency in essential food staples by introducing hybrid seeds, innovative farming techniques, and technology to the agriculture sector. Technology innovations raise yields, improve product quality, reduce losses, and conserve the environment resulting in enhanced productivity, profitability, competitiveness, and sustainability (Mogato, 2018).

Hydroponics is a method of growing plants without soil; instead, it uses mineral nutrient solutions in a water solvent and farming techniques for growing plants in a nutrient medium (Gunnam, 2020). Hydroponics was considered a system where there were no growing media, such as the Nutrient Film Technique in vegetables. But

today, it's accepted that a soilless growing medium is often used to support the plant root system physically and provide for a good buffer of solution around the root system (Devries 2003). According to Saket (2017) hydroponics' successful development has demanded the need for a self-controlled automated hydroponics system. Presently there are not many tools available, and the existing ones have significant shortcomings for using real-time information.

The Philippines is predominantly an agricultural country that is generally small-scale and dependent on manual labor. At Iloilo State College of Fisheries (ISCOF) – Dingle Campus, the Productive Enterprises' agricultural farm operates by using traditional farming techniques. Modern techniques blended with traditional methods, which also became the primary reason farming innovations are entirely forgotten and seriously lacking. Conventional approaches do not scale up well and do not provide the farm's intended enormous crop yields. Embracing modern techniques such as Hydroponics with added technological advancement management and control systems is one of the major projects to be integrated with the Productive Enterprises of ISCOF – Dingle Campus. Integrating this technology into the farm could help grow plants better and faster with lesser human efforts. Hydroponics' other benefits to the school are saving resources, such as farming areas, pesticides, holding mediums, plant nutrients, and water. Most of the said resources are recycled instead of wasted, such as holding mediums, plant nutrients, and water. Moreover, plants that are not traditionally grown in a climate would grow using a controlled environment like Hydroponics.

The ISCOF – Dingle Campus' Greenhouse farm with 40 square meters wide, is being used for farming leafy vegetables to generate income and be utilized as the hands-on training ground or farm internship of the agriculture students. The farm was handled by 17 personnel who manage and operate the operation on the farm. Based on the conducted interview, the personnel encountered problems with the current process. This prompted the researcher to develop a system entitled "Hydroponic Nutrient and Water Dispenser" to help the farmers innovate farming, manage their plants efficiently, and provide state-of-the-art hands-on training ground or farm internship of the agriculture students. The study would be of great benefit to ISCOF-Dingle Productive Enterprises and its staff, school farmers, agriculture students, community and future researchers.

Statement of the Problem

The school farm embraces manual scheduling and labor-intensive watering which drives school farm personnel to use manual dosing and mixing of plant nutrients. The school does not have the right automated tool in monitoring nutrient and water resource usage. There is no evaluation measure to assess the effectiveness of the gardening process.

Specifically, this study aimed to:

1. develop an Arduino Mega-based scheduling for automatic watering of plants;
2. create an Arduino Mega-based nutrient and water dispenser that will automatically dispense and mix plant nutrients with water based on the given dosage;
3. develop a system that simulates the monitoring and controlling of the device; and
4. evaluate and test the system using Software Quality Standard ISO 25010 in terms of Product Quality and Quality in Use.

METHODOLOGY

System Development Process

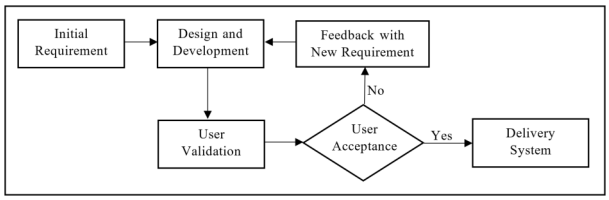

Figure 2. Life Cycle processes of Evolutionary Prototyping Methodology

Evolutionary prototyping is a method where the researcher constructs a system. After receiving initial feedback from the user, subsequent modifications in the system are produced, each with additional functionality or improvements, until the final product emerges. Furthermore, the initial system does not need to be built quickly. Evolutionary prototyping is similar to incremental development, where parts of the system may be inspected or delivered to the customer throughout the software life cycle model. (Sherrell, 2013)

The developed system is incrementally refined based on the user's feedback until it is finally accepted. It helps the researcher to save time as well as effort. This model helps in developing the project, which uses a new technology that is not well understood.

Once the client figures out the problems, the system is further refined to eliminate them. The process continues till the user approves the system and finds the working model to be satisfactory.

Figure 3. Testing the Accuracy of Hydroponic Nutrient and Water Dispenser

Figure 3 shows that the researcher demonstrated the system and let the farmers observe and test how the system works. Also, try the functionalities and behavior of the device. The tester inputs values to check whether the device displayed accurate results. Also, some values will be calibrated to verify the application receives data correctly from the device. The device tester compared the actual outputs with the expected outcomes and detected any problem that arises, fixed, and re-tested.

Figure 4. The First Prototype of Hydroponic Nutrient and Water Dispenser

Figure 4 was the first system model that was custom-made per comments given by the users. Based on the second system, the system is built. Collecting the responses of clients in an organized way was very essentials for further system enhancements.

Figure 5. The User Interface of Hydroponic Nutrient and Water Dispenser

Figure 5 shows the main user interface of the system where the user interacts that answers the objective 1 and 3. It shows the recorded resource usage from the start of the operation. These recorded data can be reset by the user using the reset switch after it was recorded for reference to start for another new recording.

Figure 6. The Reliability test results of the device controller of Hydroponic Nutrient and Water Dispenser

Figure 6 shows the device controller's reliability test results according to the user's given values and based on the recommended ratio of nutrient solution to the water. This answers the objective 2 of the study. The result shows that the peristaltic pump's dispensed amount of nutrients is 2 ml and 1 liter of water set in the controller. Results indicate that every time the sensor of the mixed nutrient tank detects that the distance from the sensor to the nutrient mixture's top edge level is greater than 28cm=low, the nutrient and water dispenser will start refilling the tank according to the set dosage amount by the user. The controller also allows the user to reset the dosage with the use of the calibration switch button. The last dosage settings are considered as the default dosage. Whenever there is a power outage, the previous settings are automatically saved to start the operation without human intervention. The test results show

that the developed system meets all the intended functions needed by the client. It provides accurate and correct results following the client's demands.

FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

Table 1. Summary of Product Quality Evaluation Results

Characteristics	IT Experts		End-User / Farmers		Agricul-turist		Entire Group	
	M	I	M	I	M	I	M	I
Functional Suitability	4.63	VE	4.57	VE	4.60	VE	4.60	VE
Performance Efficiency	4.67	VE	4.60	VE	4.67	VE	4.64	VE
Compatibility	4.61	VE	4.71	VE	4.67	VE	4.66	VE
Usability	4.61	VE	4.76	VE	4.77	VE	4.71	VE
Reliability	4.54	VE	4.80	VE	4.6	VE	4.65	VE
Security	4.57	VE	4.60	VE	4.28	VE	4.48	VE
Maintainability	4.78	VE	4.64	VE	4.7	VE	4.71	VE
Portability	4.72	VE	4.73	VE	4.73	VE	4.73	VE
Overall Mean	**4.64**	**VE**	**4.68**	**VE**	**4.63**	**VE**	**4.65**	**VE**

Legend:	Scale	Interpretation	
M = Mean	4.21 - 5.00	Very Effective	VE
I = Interpretation	3.41 - 4.20	Effective	E
	2.61 - 3.40	Fairly Effective	FE
	1.81 - 2.60	Less Effective	LE
	1.00 - 1.80	Poorly Effective	PE

Table 1 showed the Product Quality summary evaluation results evaluated by the IT Experts, end-users / farmers, and Agriculturist. It showed that the system acquired a "Very Effective (VE)" product quality result based on the ISO 25010 International Standards. As a whole, all specified criteria earned a "Very Effective" in terms of its Functional suitability (M=4.60), Performance efficiency (M=4.64), Compatibility (M=4.66), Usability (M=4.71), Reliability (M=4.65), Security (M=4.48), Maintainability (M=4.71), and Portability (M=4.73). It means that the system could meet the set functions that cover all the specified task and user objectives, provide correct results with the needed degree of precisions, and display resources monitoring data.

The overall mean of 4.65, interpreted as "Very Effective," means that the system is suitably functional, performs efficiently, compatible, usable, reliable, secure, maintainable, and portable enough to be implemented. The system indicates that the stated requirements have been achieved and performed.

Table 2. Summary of Quality in Use Evaluation Results

Characteristics	IT Experts		End-User / Farmers		Agricul-turist		Entire Group	
	M	I	M	I	M	I	M	I
Effectiveness	4.75	VE	4.67	VE	4.7	VE	4.71	VE
Efficiency	4.61	VE	4.69	VE	4.6	VE	4.63	VE
Satisfaction	4.9	VE	4.57	VE	4.8	VE	4.76	VE
Freedom from Risk	4.64	VE	4.63	VE	4.8	VE	4.69	VE
Context Coverage	4.63	VE	4.58	VE	4.75	VE	4.65	VE
Overall Mean	**4.71**	**VE**	**4.63**	**VE**	**4.73**	**VE**	**4.69**	**VE**

Legend:	Scale	Interpretation	
M = Mean	4.21 - 5.00	Very Effective	VE
I = Interpretation	3.41 - 4.20	Effective	E
	2.61 - 3.40	Fairly Effective	FE
	1.81 - 2.60	Less Effective	LE
	1.00 - 1.80	Poorly Effective	PE

Table 2 showed the summary of product Quality in use evaluated by the IT Experts, end-users / farmers, and Agriculturist. It showed that the system acquired a "Very Effective (VE)" results in determining the perception of the degree to which the system meets the client's / user's expectations/satisfaction.

As a whole, all specified criteria acquired a "Very Effective" Quality in Use evaluation results in terms of its effectiveness (M= 4.71), efficiency (M = 4.63), satisfaction (M = 4.76), freedom from risk (M= 4.69), and coverage context (M = 4.65). It means that the system/ system is effective, efficient, useful, hazard-free, and flexible.

FINDINGS

The findings of this research revealed that:

1. The System is very effective in terms of its product quality with mean average of "M=4.6" and quality in use standards with mean average of "M=4.7", which means that it meets the IT Experts, Agriculturist and Users/Farmers expectations, satisfaction and showed high interest in the system.
2. Placing the greenhouse facility in the best location for Photosynthesis is essential for proper plant growth.
3. The system is adaptable and can be used for experimental and developmental research for further enhancements and usage flexibility.
4. The system is adaptable and maintainable that can be used for the mass production of leafy vegetables.

CONCLUSIONS

Based on the results presented, the following conclusions were drawn:

1. The prototype was successfully designed, developed, and tested for client satisfaction.
2. Hydroponics systems offers high accuracy in dosing and mixing of hydroponic nutrients.
3. The system can store and display resource usage data automatically for user references.
4. The system conformed to the ISO standards. As expected, the system is very effective for its specific functions and operation.

RECOMMENDATIONS

Based on the findings and conclusions, the following are hereby recommended:

1. It is recommended to upgrade and enhance the packaging of the system for waterproofing that can be used both indoors and outdoors and to utilize its benefits fully.
2. It is highly recommended that the system be implemented in all campuses to integrate innovation in farming and provide a state-of-the-art hands-on training ground for faculty and student researchers.
3. It is recommended to conduct user training/ orientation to the end-users on operating and maintaining the system.
4. It is highly recommended that the system must be implemented correctly with full respect for plant needs, water, environment, users, growers, and farmers' safety to be utilized for mass production.

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~John Ray F. Perez~

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PERFORMANCE OF MOTHER TONGUE BASED MULTILINGUAL EDUCATION (MTB-MLE) CLASSES: EFFECTS TO THE READING COMPREHENSION OF GRADE 4 STUDENTS IN ANTIPOLO CITY

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ABSTRACT

The study analyzed the performance of mother-tongue-based multilingual education classes from Grades 1-3 and its effect on the reading comprehension of Grade 4 students. A total of 140 Grade 1–4 teachers from Bagong Nayon 2 Elementary School, Isaias S. Tapales Elementary School, and Sapinit Elementary School participated in this study. Grades 1-3 provided data on their students during the school year 2019-2020 in terms of: Activating Schema and Prior Knowledge; Comprehension of Literary Text; Comprehension of Informational Text; and Attitude toward Language, Literacy, and Literature. Likewise, grade 4 teachers provided data on the level of reading proficiency in English based on Philippine Informal Reading Inventory results. The teachers were interviewed to strengthen the results of the study. The study found out that during the pretest, most of the Grade 4 students had difficulty understanding the reading text and were in the frustration level. Teachers revealed that during English classes, students kept on speaking in Filipino (Tagalog) and requesting English teachers to translate the reading text into Filipino. Furthermore, teachers associate it with exposure to the mother tongue from kindergarten to grade three. All the teachers interviewed believed that using their mother tongue as a medium of instruction improved students' confidence in performing in the Filipino language, but negatively affected their speaking proficiency and reading comprehension level. The study suggested that, even if the mother tongue is used in kindergarten through grade 3, English teachers should take significant steps to practice speaking English to students during English classes so that students do not struggle to understand English in grade 4.

Keywords: MTB-MLE, K-12 Curriculum, reading comprehension, BICS, CALP

INTRODUCTION

Republic Act 10523, otherwise known as the "Enhanced Basic Education Act of 2013," legalized Mother Tongue-Based Multilingual Education (MTB-MLE), where students begin to learn through their mother tongue before learning Filipino—the country's national language, and English—the global language (Ball, 2010). With the belief that learners easily understand the lesson when taught in their mother tongue, MTB-MLE is the best as a foundation for bilingual and multilingual education (Ball, 2010). Moreover, children's ability to learn a second or additional language does not suffer when their mother tongue is the main language of instruction at the elementary level. Fluency and literacy in the mother tongue may improve the cognitive and linguistic foundation for learning additional languages--Filipino and English.

MTB-MLE started its implementation in School Year 2012-2013 in Kindergarten, Grades 1, 2, and 3, as part of the K to 12 Basic Education Program's goal of "Every Child-A-Reader and A-Writer by Grade 1 (DepEd Order No. 16, s. 2012).

As part of the K-12, MTB-MLE became a separate subject. The language of instruction in academic institutions is also in mother tongue from kindergarten to Grade 3. Eight (8) major languages or Lingua Franca and four (4) other languages were utilized as language of instruction as follows: a) Tagalog b) Kapampangan c) Pangasinense d) Iloko e) Bikol f) Cebuano g) Hiligaynon h) Waray i) Tausug j) Maguindanaoan k) Maranao; l) Chabacano. Through DepEd Order No. 28, in 2013, Ybanag, Ivatan, Sam-

bal, Aklanon, Kinaray-a, Yakan, and Surigaonon were added to the list of the languages of instruction.

DepEd Order 31, s. 2012, provided additional guidelines about the goals of the policy and possible innovative ways of implementing it.

In the "2030 Agenda for Sustainable Development." countries were called to work together to achieve seventeen Sustainable Development Goals (SDGs) over the next fifteen years. Goal 4, which is to "Ensure inclusive and quality education for all and promote lifelong learning," makes the point that obtaining a quality education is the foundation for improving people's lives and sustainable development.

Teaching using the language that the student knows best was believed to improve the quality of learning. This is evident in the 1998 Lubuagan project's First Language Component (FLC) Bridging Program in Lubuagan, Northern Philippines, where more pupils showed pleasant, dynamic, and interactive participation in class discussion using vernacular language. Students' mutual interest led to positive peer relations, and improved class attendance.

At the United Nations Educational, Scientific, and Cultural Organization (UNESCO) (2015), delegates from 155 countries believed that primary education must be accessible to all children to reduce illiteracy around the world, and the use of the mother-tongue as a language of instruction is one of the best ways of bringing education to all. Since 1953, UNESCO has encouraged mother-tongue instruction in primary education (UNESCO, 1953). However, as the mother tongue continues to be implemented as an instructional language, problems and challenges continuously appear.

In Pangasinan, the study of Cruz (2015) found that many of the instructional objectives in the mother tongue as a subject were not met based on their poor performance in grammar awareness, vocabulary development, and reading comprehension.

Lack of instructional materials written in the vernacular is one of the major setbacks in the implementation of MTB-MLE (Merino, 2016), while Metila, 2014; Lazatin, et al., 2016, cited a lack of an evaluation mechanism that can account for the multifaceted components of MTB-MLE.

The Komisyon sa Wikang Filipino (KWF) recorded more than one hundred thirty (130) Philippine languages from Ivatan to Mandaya. Yet, after nine years of using the mother tongue as an instructional language in 2012, there are still not enough materials written in all the suggested languages of instruction.

Elli, et al. (2016) assessed the implementation of MTB-MLE in Guelew Integrated School in Pangasinan, where the community speaks two mother tongues: Pangasinan and Ilokano. The study revealed the community's mixed emotions regarding the policy. Furthermore, more families are using Filipino as the language at home compared to Pangasinan and Ilokano. Even the teachers showed divided views. Some teachers like Filipino and English as the medium of instruction. Others prefer the mother tongue since children are more active in class when classes are taught using their mother tongue. Moreover, regardless of which language was utilized, no difference in the learning attitude or participation of students was observed. This study showed that even in provinces where there is a regional language, many families are still using the Philippine national language at home.

Numerous studies support the notion that students learn best when taught in their mother tongue. However, there are some that contradict this.

In the study by Bajas et al. (2017) in Basey Central Elementary School in Samar, where Waray is the mother tongue, teachers observed that pupils show a lack of interest in studying when Waray is the instructional language but change their behavior when the teacher speaks in English. So, teachers code switch during class discussion and when giving instructions for activities. This study contradicts the notion that mother tongue as a language of instruction improves students' class performance, while for Mabaleka (2014), more preparation and training need to be done before the implementation of this policy.

While the study of Namanya (2017) revealed that children taught in the mother tongue demonstrated a decline in their English literacy level, while students taught in English showed significant progress in their English proficiency. Namanya's study seems to suggest that the mother tongue as a language of instruction in the Philippines may adversely affect children's English literacy and, therefore, may jeopardize their competitiveness in the global arena.

Status of Filipino Learners in International Assessments

In the 2018 global survey called Program for International Assessment (PISA), the Philippines ranked last among the 79 countries, while in the Trends in International Mathematics and Science

Study 2019 (TIMSS), Filipino students only scored 297 in mathematics and 249 in science, which are "significantly lower" than any other participating country. The scores obtained in the tests placed the Philippines in the lowest spot among all 58 participating countries for both tests.

Due to the unpreparedness of instructional materials and the dismal performance of Filipino students in international assessments, even the legislators are making their move against the MTB-MLE policy.

In February 2020, Representative Roman T. Romulo filed House Bill No. 6125 to suspend the implementation of MTB-MLE, citing several reasons, such as insufficient books, teaching materials, and supplies to effectively implement the use of mother tongue in the instructions and assessment of learners in kindergarten to grade 3.

This year, Baguio City Representative Mark Go filed House Bill 6405. This is posted in the March 19, 2021, issue of the Committee Daily Bulletin, which proposes the abrogation of the mandatory use of regional languages as the primary medium of instruction in kindergarten through Grade 3, and to relegate the regional languages as auxiliary media of instruction based on the Constitution. Article XIV, Section 7 of the 1987 Constitution provides

> *Section 7. For purposes of communication and instruction, the official languages of the Philippines are Filipino, and, until otherwise provided by the law, English. The regional languages are the auxiliary official languages in the regions and shall serve as an auxiliary medium of instruction therein*.

Rep. Go cited that the poor performance of learners in several national and international student assessments after the enactment of RA 10533 is quite telling and alarming. Moreover, Rep. Go cited that 85% of Filipinos understand Filipino, while 76% of Filipinos understand English, based on the 2000 and 2008 Social Weather Station (SWS) surveys, respectively.

Aside from that, all books and instructional materials were written either in Filipino or in English. Some research and the proponents of MTB-MLE claim that it is the best way to give all children an equal chance for education. However, not learning English in the first four years in the classroom might also jeopardize the Filipino's chance to compete globally where English is the lingua franca.

The Linguistic Society of the Philippines (LSP) states its stand against House Bill No. 6125 and House Bill No. 6405, citing that "the Philippine educational system has to move forward following a roadmap framed by experts in linguistics and language education based on empirical grounding." Furthermore, the changes are evidence-based and may be observed in other multilingual countries like Papua New Guinea, Nepal, Bolivia, Guatemala, Zambia, and Bangladesh, where the mother tongue is viewed as very effective in improving the foundation for the learning of other languages like English. Moreover, LSP believes that House Bill No. 6405 is retrogressive and will revert the improved Philippine educational system to its previous state where children of indigenous minorities go to schools where their first language was never used, and teachers do not understand them. These instances motivated the researcher to conduct this study.

Theoretical Framework

This study was anchored on the second language acquisition theory of Jim Cummins. The basic interpersonal communicative skills (BICS) and cognitive academic language proficiency (CALP) explain the preparations and the required time a second language learner needs to develop competitive conversational and academic skills in the English language.

"BICS stands for "basic communication and listening skills." Cummins stated that children may develop native-speaker fluency within two years of immersion in the target language. Moreover, it can be easily acquired through communicating with native English speakers. BICS is expected to occur when there are contextual situations and the required language delivery (Baker, 2006).

Listening to English videos and then practicing speaking by socializing with other English-speaking people may help to accelerate proficiency.

CALP, on the other hand, is the students' ability to cope with the academic demands of the various academic subjects in school. According to Cummins, 5-7 years are needed for a child to reach the native speakers' level in terms of academic language. It could even take up to ten years when the student has no prior experience in school or lacks parental support (Shulman).

For Cummins, while learning one language, the student also acquires a set of skills and implicit metalinguistic knowledge that may be useful while learning another language. Cummins calls it CUP (common underlying proficiency). Accord-

ing to Cummins, the CUP is the basis for the development of both the first language (L1) and the second language (L2). Since the CUP is the basis, any development of the CUP in the first language (L1) may have a positive effect on the other languages (L2 and L3).

Conceptual Underpinnings

This study was based on the premise of the MTB-MLE that: 1) learners learn to read more quickly when in their first language (LI); 2) pupils who have learned to read and write in their first language learn to speak, read, and write in a second language (L2) and a third language (L3) more quickly than those who are taught in a second or third language first; and 3) in terms of cognitive development and its effects in other academic areas, pupils taught to read and write in their first language acquire such competencies more quickly.

The researcher prepared the research problems and the survey questionnaire based on the notion mentioned above.

STATEMENT OF THE PROBLEM

1. What is the level of performance of Mother Tongue-Based Multilingual Education classes in grades 1-3 in terms of:
   1.1 Schema and Prior Knowledge Activation,
   1.2 Literary Text Comprehension,
   1.3 Understanding of Informational Text; and
   1.4 Attitudes Toward Language, Literacy, and Literature?
2. What is the reading comprehension status of grade 4 students based on the English Phil-IRI results?
3. What is the effect of the mother tongue as a language of instruction on the reading comprehension in English of grade 4 students?
4. What plan of action may be crafted based on the results of the study?

Scope and Limitation

This study was conducted in the City Schools Division of Antipolo during the second semester of the school year 2020–2021. School records of grade 1-4 students from three (3) elementary schools within the Schools Division of Antipolo during the school year 2019-2020 were gathered and analyzed. The schools that participated in this study include Isaias S. Tapales Elementary School, Sapinit Elementary School, and Bagong Nayon 2 Elementary School.

METHODOLOGY

This study utilized mixed research methods to achieve its main objective, which is to assess the performance of mother tongue-based multilingual education classes from grades 1-3 and evaluate their effects on the reading comprehension of grade 4 students in Antipolo City.

For the quantitative part, an online survey-questionnaire was conducted to profile the teacher -respondents and determine the level of performance of grade 1-3 mother tongue-based multilingual education classes in terms of: activating schema and prior knowledge; comprehension of literary text; comprehension of informational text; and attitude toward language, literacy, and literature. Then, analyze the reading comprehension status of grade 4 students based on the English Phil-IRI results.

For the qualitative part, a one-on-one online interview with the grade 4 teachers was conducted to determine the effect of the mother tongue as a language of instruction on the reading comprehension of grade 4 students.

Sampling

Purposive sampling was used to identify the schools that would be included in the study. The criteria include the following: schools must be in different districts; and school populations must be between 1000 and 3000, 4000-6000, or greater than 6000.From the criteria, the schools were chosen: This is to determine how the reading comprehension of grade 4 students might differ as the school population grows.

School	District	Population
Isaias S. Tapales Elementary School	II-C	4,037
Sapinit Elementary School	II-E	1,249
Bagong Nayon 2 Elementary School	I-B	6,491

Respondents

The data was collected from 140 grade 1-4 teachers from the City Schools Division of Antipolo. Fifty (50) Isaias S. Tapales Elementary School (ISTES) teachers, eighteen (18) Sapinit Elementary School teachers, and seventy-two (72) Bagong Nayon 2 Elementary School (BN2 ES) teachers. Out of 140 teachers, thirty-two (32) are teaching grade 1, forty-four (44) are teaching

grade 2, thirty-nine (39) are handling Grade 3, and twenty-five (25) are handling grade 4 students. The teacher-respondents were profiled according to sex, years in service, and teaching position.

Table 1. Profile of the teacher-respondents

Sex	Grade 1	Grade 2	Grade 3	Grade 4	F Total	%
Male	0	1	2	2	**5**	**4**
Female	32	43	37	23	**135**	**96**
Years in Service	**Grade 1**	**Grade 2**	**Grade 3**	**Grade 4**	**F Total**	**%**
1-5 years	12	14	8	5	**39**	**28**
6-10 years	2	9	7	6	**24**	**17**
11-15 years	9	7	5	3	**24**	**17**
16 years and above	9	14	19	11	**53**	**38**
Position	**Grade 1**	**Grade 2**	**Grade 3**	**Grade 4**	**F Total**	**%**
Teacher I	23	25	17	12	**77**	**55**
Teacher II	2	9	7	7	**25**	**18**
Teacher III	7	10	14	4	**35**	**25**
Master Teacher 1	0	0	1	2	**3**	**2**

Based on the profile, 96% of the teacher-respondents are female, with 16 years of teaching experience or more. This entails that those who are handing the foundation period in the learning of students are female teacher-experts in the field. Though 55% of them are holding teacher 1 positions, their more than ten years of teaching experience was deemed enough to consider them very proficient in the delivery of instruction. Therefore, they are expected to produce quality movers to the next grade level.

Data Collection

The chosen schools were informed about the conduct of the study through their master or key teacher representative and school head.

An online survey-questionnaire was also crafted and subjected to the validation of select master teachers from the division.

For the administration, the online survey was available for two weeks. Then, grade 4 teacher-respondents undergo one-on-one online interviews.

Ethical Considerations

The study participants were informed that participating in this endeavor was voluntary and a statement of informed consent in accordance with the Data Privacy Act of 2012 was included in the questionnaire.

Data Analysis

Frequency and percentage were utilized to determine the profile of teacher-respondents in terms of sex, years in service, and teaching position; and the level of performance of grade 1-3 Mother Tongue-Based Multilingual Education classes in terms of: Activating Schema and Prior Knowledge; Comprehension of Literary Text; Comprehension of Informational Text; and attitude toward Language, Literacy, and Literature.

Percentage increase and percentage decrease were used to find out the reading comprehension status of grade 4 students based on the English Phil-IRI results.

Transcribing, coding, and classifying by themes were utilized to determine the effect of the mother tongue as a language of instruction had on the reading comprehension in English of grade 4 students.

FINDINGS

Table 2. Level of performance of Grade 1-3 MTB-MLE Classes

Activating Schema and Prior Knowledge										
	Outstanding		**Very Satisfactory**		**Satisfactory**		**Fairly Satisfactory**		**Did not meet Expectations**	
	F	%	F	%	F	%	F	%	F	%
Grade 1-32	6	**20**	22	**69**	4	**11**	0	**0**	0	**0**
Grade 2-	9	**20**	27	**62**	8	**19**	0	**0**	0	**0**
Grade 3-	7	**17**	28	**71**	5	**12**	0	**0**	0	**0**
Comprehension of Literary text										
	Outstanding		**Very Satisfactory**		**Satisfactory**		**Fairly Satisfactory**		**Did not meet Expectations**	
	F	%	F	%	F	%	F	%	F	%
Grade 1	7	**22**	21	**64**	5	**14**	0	**0**	0	**0**
Grade 2	10	**22**	25	**57**	9	**20**	0.6	**1**	0	**0**
Grade 3	5	**14**	28	**71**	6	**14**	0.3	**1**	0	**0**
Comprehension of Informational Text										
	Outstanding		**Very Satisfactory**		**Satisfactory**		**Fairly Satisfactory**		**Did not meet Expectations**	
	F	%	F	%	F	%	F	%	F	%
Grade 1	7	**21**	20	**63**	5	**16**	0.2	**1**	0	**0**
Grade 2	7	**17**	25	**56**	10	**23**	2	**4**	0	**0**
Grade 3	5	**13**	25	**63**	8	**21**	1	**3**	0	**0**

Attitude toward Language, Literacy and Literature										
	Outstanding		Very Satisfactory		Satisfactory		Fairly Satisfactory		Did not meet Expectations	
	F	%	F	%	F	%	F	%	F	%
Grade 1	8	**24**	20	**64**	4	**11**	0.3	**1**	0	**0**
Grade 2	13	**29**	27	**61**	5	**11**	0	**0**	0	**0**
Grade 3	5	**14**	27	**70**	5	**13**	1	**3**	0	**0**

Legend: Outstanding-90-100; Very Satisfactory- 85-89; Satisfactory-80-84; Fairly Satisfactory-75-79; Did not meet Expectations-below 75

It is evident from the table that most of the grade 1-3 MTB-MLE classes of the participating schools were assessed with very satisfactory performance based on the teachers' evaluation.

In terms of activating schema and prior knowledge, which involve skills in predicting events and actions based on prior knowledge and text features; interpreting information from graphic organizers like webs, Venn diagrams, and flow charts to comprehend text; Modifying prior knowledge based on the new information learned from the text grades 1-3 classes were assessed as very satisfactory by 69%, 62%, and 71% of teachers, respectively. While 20% of grade 1 teachers, 20% of grade 2 teachers, and 17% of grade 3 teachers assessed their classes as outstanding in performance.

Comprehension of literary texts involves skills in: participating actively during the reading of the text by making comments, asking questions, and clarifying information; recalling important information in the story read; Through discussions, music, art, drama, and a variety of writing activities, stories and poems through dramatizations, illustrations, and writing activities, supporting responses to stories and poems by quoting relevant passages from the text as well as their own interpretations; offering observation, making connections, reacting, speculating, interpreting, and raising questions in response to the text; Giving one's opinion based on personal experiences; writing another ending to a story read; writing a short summary of a story; identifying the number of stanzas, lines, and rhyming words in poems read; and giving the rhyme scheme of poems read. Twenty-two percent of grade 1, 22% of grade 2, and 14% of grade 3 teachers assessed their classes as outstanding in performance, while 64%, 57%, and 71%, respectively, gave very satisfactory assessments of their classes.

While in the domain of informational text comprehension, which includes identifying organizational features of expository text such as title, table of contents, heading, bold, and print; locating specific information by using organizational features in expository text; identifying the main idea in expository text; locating facts in response to questions about expository text; following a set of written three-step directions; and stating the meaning of specific signs and symbols. A total of 21% of grade 1, 17% of grade 2, and 13% of grade 3 teachers evaluated their class performance as outstanding, while 64%, 61%, and 70%, respectively, gave very satisfactory assessments. This revealed that many reading-related skills were being honed in the MTB-MLE classes, which, if done properly, is expected to result in enhanced expertise in analyzing a text.

Finally, in terms of attitude toward language, literacy, and literature, which includes manifesting enjoyment of reading by browsing through storybooks; showing love for reading by listening attentively during story reading, making comments, and asking questions; and memorizing and reciting poems read in class. Twenty-four percent of Grade 1, 29% of Grade 2, and 14% of Grade 3 teachers gave outstanding assessments on performance, while 64%, 61%, and 70% of Grade 1-3 teachers assessed their class as very satisfactory.

To sum it up, the level of performance of Grade 1-3 MTB-MLE classes in terms of: Activating Schema and Prior Knowledge; Comprehension of Literary Text; Comprehension of Informational Text; and Attitude toward Language, Literacy, and Literature was assessed as very satisfactory with a grade of 85-89%.

With the results, it seems that it has a positive impact on the child's learning from grades 1-3. The result is congruent with the study of Bernardo et al. (2018) in Northern Isabela, where Ibanag is the mother tongue. The study discovered that teachers had positive reactions, attitudes, and perceptions toward the implementation of the MTB-MLE program, despite a lack of textbooks, curriculum guides, and other instructional materials written in Ibanag. On a positive note, teaching K to 3 students using their mother tongue helped the teachers explain the lessons well, while the pupils understood and expressed their thoughts comfortably.

The statement by UNESCO (1953) states that the best medium for teaching is the mother tongue of the pupils. However, the study by Valerio (2015) on MTB-MLE implementation in Quirino province revealed that in terms of appreciation, teachers are uncertain because teaching materials and assessment of learning have not been tran-

scribed into the regional languages of the learners. Aside from that, mother tongue-based instruction cannot really elevate the learners' academic performance.

This notion is supported by the study by Cruz (2015) of the Grade 1 students in Pangasinan I. The study showed that in comprehension, both in listening and reading, most pupils need further assistance. Besides, most of the students achieved "average" in vocabulary development, grammar awareness, and reading comprehension.

Table 3. ENGLISH PHIL-IRI Test Results (PRE)

Grade		Enrolment			Score (≤14)				Score (≥14)			
		Male	Female	Total	Male	Female	Total	%	Male	Female	Total	%
IV	ISTES	287	253	**540**	160	120	**280**	**52 %**	127	133	**260**	**48 %**
	SAPIN-ITES	78	70	**148**	60	40	**100**	**68 %**	18	30	**48**	**32 %**
	Bagong Nayon 2 ES	455	418	**873**	256	188	**444**	**51 %**	196	233	**429**	**49 %**
		820	**741**	**1561**	**481**	**357**	**838**	**54 %**	**336**	**387**	**723**	**46 %**

Based on the table showing the Philippine Informal Reading Inventory (Phil-IRI) pretest, a total of eight hundred thirty-eight (838) scored less than 14 (Score ≤ 14). ISTES accounts for 280 (or 52%), Sapinit ES for 100 (or 68%), and Bagong Nayon 2 Elementary School accounts for 444 (or 51%).

This means that, regardless of district affiliation and school category, more than 50% of Grade 4 students in each school need improvement in English reading comprehension.

In the Phil-IRI, all learners who will achieve Raw Score< 14 in the Group Screening Test (GST) will undergo further assessment such as: 1) Administration of the Phil-IRI graded passages (oral reading); 2) Administration of the Phil-IRI listening pre-test; 3) Administration of the Phil-IRI pretest (silent reading); then, 4) Provision of reading intervention; finally, 5) Administration of the Phil-IRI Posttest.

Since the students were exposed from grades 1-3 in the mother tongue of the region, Filipino (Tagalog), in the case of the participating schools in this study, the learners seemed to struggle to achieve the 14-minimum score of the PHIL-IRI Group Screening Test.

The result is in line with Namanya's (2017) study, which revealed that children taught in the mother tongue demonstrated a decline in English literacy level while students taught in English showed significant progress in their English proficiency.

The result supports the theory of Cummins on Cognitive Academic Language Proficiency (CALP) that it takes 5-7 years before a second language learner can master the target second language in decontextualized academic situations. As the students were taught and exposed to their mother tongue as a language of instruction from grades 1-3, they showed difficulty in reading and analyzing English text.

This is supported by the teacher-respondents' response in the interview that "during English classes, students do not have prior knowledge about the different English words." Teachers blame the exposure to the mother tongue in grades 1-3. Moreover, teachers believed that "they can't understand well what they read because MTB is the medium of instruction in their kindergarten–grade 3.

The large number of students (838) who did not achieve the 14-test score even after three years of being exposed in their mother tongue as a language of instruction seems to contradict the premise of MTB-MLE that "learners who have learned to read and write in their first language learn to speak, read, and write in a second language (L2) and a third language (L3) more quickly than those who are taught in a second or third language first." As evident in the Phil-IRI results and the teachers' view, mother tongue as a language of instruction from grade 1 to grade 3 is negatively affecting grade 4 students' English literacy and reading proficiency.

Table 4. ENGLISH PHIL-IRI Test Results (POST)

Grade		Enrolment			Score (≤14)				Score (≥14)			
		Male	Female	Total	Male	Female	Total	%	Male	Female	Total	%
IV	ISTES	287	253	**540**	136	98	**234**	**43 %**	151	155	**306**	**57 %**
	SAPIN-ITES	78	70	**148**	54	36	**90**	**61 %**	24	34	**58**	**39 %**
	Bagong Nayon 2 ES	454	394	**848**	116	69	**185**	**22 %**	337	326	**663**	**78 %**
		819	**717**	**1536**	**306**	**203**	**509**	**33 %**	**512**	**515**	**1027**	**67 %**

According to the post-test results, even after administering the Phil-IRI graded passages and providing reading intervention as required by the Phil-IRI Manual, a total of 509 Grade 4 students did not meet the 14 score requirements. ISTES has two hundred thirty-four (234), or 43%, Sapinit ES has ninety (90), or 61%, and Bagong Nayon 2 ES has one hundred eighty-five (185), or 22%.

From 838 students in the pretest, the number of students who scored less than 14 decreased to 509, which is still a large number of students to improve in reading comprehension. According to the data, more comprehensive reading remediation is required. Each school must cooperate, and teachers should collaborate to ensure seamless and effective reading intervention.

The Philippines ranked last among the 79 countries that participated in the 2018 Program for International Assessment (PISA). The assessment covers reading, mathematics, and science and measures knowledge, skills, and attitudes (KSA) and the effective use of knowledge in everyday tasks and challenges. If our grade 4 learners are struggling to achieve the minimum score of 14 in the Phil-IRI even after the reading remediation, it is not surprising that the Philippines recorded the least in international assessments.

Table 5. Comparative Analysis of the PRE and POST Phil-IRI Results

	Score (≤14)		Difference	Percentage	Score (≥14)		Difference	Percentage
	PRE	POST			PRE	POST		
ISTES	280	234	46	**16%**	260	306	46	**18%**
SAPINIT ES	100	90	10	**10%**	48	58	10	**21%**
Bagong Nayon 2 ES	444	185	259	**58%**	429	663	234	**55%**
	838	509	329	**39%**	723	1027	304	**42%**

As observed on the table, Bagong Nayon 2 Elementary School recorded the biggest decrease (58%) in the number of learners who scored less than 14 (Score ≤ 14). The small percentage of decrease was also evident in ISTES (16%) and Sapinit Elementary School (10%).

Moreover, Bagong Nayon 2 Elementary School showed the highest percentage increase of 55% in the number of learners who scored equal or greater than 14 (Score ≥ 14). Sapinit ES achieved a 21% percentage increase, while ISTES improved by 18%.

Based on the data, it can be inferred that Bagong Nayon 2 Elementary School recorded the biggest improvement. During the interview, the teachers revealed that the success was due to the two-month intensive reading intervention, which was conducted daily by the teachers. Then they conducted an assessment to check the student's progress. It was followed by continued reading remediation in school and the implementation of a reading calendar at home. Teachers administered the reading remediation after their respective classes. They prepared reading materials based on the reading levels of the students. Some teachers even suggested using CVC words to struggling grade 4 students before introducing longer words and phrases because the child can only recognize letters but cannot read even the most basic sight words. after improvement, they introduced short stories.

After the interview with the Grade 4 teachers, the majority mentioned that the mother tongue as a language of instruction from Grade 1-3 negatively affects the students' speaking and reading comprehension in English. The following are the themes gathered based on the teachers' responses.

POOR OR LOW COMPREHENSION IN ENGLISH

- low in reading comprehension
- most of the students do not comprehend very well in English
- some of them lack comprehension
- students were able to read but without comprehension.
- Some of them are fast readers but they have poor comprehension.
- low in comprehension
- low comprehension and reading ability in English
- Due to the use of the mother tongue in the previous grade, the students did not meet the reading level, especially their comprehension.
- poor comprehension
- Most of my students have difficulty comprehending English subject.

Many of the teachers handling grade 4 are seasoned teachers with more than 16 years of teaching experience. They testified that students they worked with prior to the implementation of mother tongue as a language of instruction were more competitive in the English language than students at this time who were exposed to Filipino during their foundation period. All the teachers interviewed believed that MTB-MLE as a subject was just a repetition of combined Filipino and Araling Panlipunan (AP) subjects.

Furthermore, using mother tongue as a language of instruction only helped improve confidence in speaking Filipino (Tagalog) but had a

negative impact on English comprehension. Teachers also relayed that using the mother tongue as a language of instruction from Grades 1 -3 is not preparing the child's competence in English, leading to poor reading comprehension and analyzing instructions.

TRANSLATION OF WORDS FROM ENGLISH TO MOTHER TONGUE (FILIPINO)

- instructions in English should be translated in Filipino
- students can understand if words are translated and/ or simplified in terms of reading comprehension English subjects need to be translated most of the time in Tagalog.
- can't understand well what they read because of MTB is the medium of instruction on their Kindergarten - grade 3.
- Students generate questions first before reading

Due to the exposure to the mother tongue, the students became active in recitation using Filipino (Tagalog). Even in grade 4, when students are transitioning from their mother tongue to English, they ask teachers to translate the instruction into Filipino. They do not recite anything and just keep quiet during English classes and ask to practice speaking English during discussion.

DIFFICULTY IN READING ENGLISH WORDS

- some of them are slow when it comes in reading in English
- they are having a hard time reading English stories
- during English classes, pupils do not have prior knowledge about the different English words
- difficulties in reading and understanding English words
- Poor in spelling and in reading. Comprehension is very low, some of the pupils cannot even construct simple sentences. Pupils are having difficulties in English

Teachers shared that student nowadays display very poor reading ability. Teacher-participants revealed that they even encounter students who can recognize letters but cannot read even the basic sight words. There are also students who just memorize the set of basic sight words when taught and read in the same sequence, but when the teacher breaks the sequence of basic sight words, some students are not able to read the words.

Teachers connect this to the prior knowledge of the students and their years of exposure to Filipino as a language of instruction. All the teachers interviewed agree that the use of bilingual language (Filipino and English) as a language of instruction is better than solely the mother tongue from Grades 1-3.

INABILITY TO EXPRESS THOUGHTS AND IDEAS

- They can't express their thoughts
- Students struggle in reading English words
- Some students do not recite because they cannot explain in English
- pupils have difficulty in understanding the lessons and expressing their views/opinions about a certain topic.
- some students have every poor foundation because they were promoted as grade 4 without reading skills in English

During recitation in the English classes, students were observed to show difficulty in expressing their thoughts and ideas. Teachers complained that students commonly request to be allowed to speak or recite in Filipino. Villalba (2013) observed that teacher participants' attitudes towards their mother tongue as a language of instruction were neither positive nor negative but saw positive results in the students' grades and literacy development.

The impact of the mother tongue as a language of instruction may differ based on the location, but what is important is the overall effect of the change in the language of instruction on the total development and reading proficiency of the learners, which will affect their global competitiveness

Plan of action

To address the issues on the reading comprehension level of grade 4 students, the following plan of action was prepared.

Area Thrust	Program	Objectives	Manpower	Time Frame	Budget	Source of Fund	Success Indicators
Pupil Development	Reading remediation to Grade 4 students	To enhance the reading comprehension of students To reduce the number of students who scored less than 14 in the Phil-IRI	School Head Teachers Reading Coordinator Grade level chairman Parents Pupils	Every August-January of the school year	3,000.00	MOOE	Improved reading level of Grade 4 pupils. 70% of those who got less than 14 during Pre-test achieved equal or more than 14 in the Post-test by February to March
Staff Development	LAC sessions and Focus Group Discussion (FGD) about Capacity building on Teaching Beginning Reading	To enhance methods, strategies and techniques in teaching reading by attending LAC/ FGDs/ trainings/ capacity buildings	School Head Teachers Reading Coordinator Grade level chairman	August	1,000.00	Canteen Fund/ MOOE	100% of Grade 4 teachers display confidence in teaching reading
Curriculum Development	Preparation of instructional materials of the following level of comprehension literal inferential application critical	To provide reading materials showing • literal • inferential • application • critical level of comprehension	School Head Teachers Reading Coordinator Grade level chairman	August-September	2,000.00	MOOE	100% completion of the compilation of annual reading intervention materials
Physical Facilities Development	Setting of reading center/corner	To prepare functional reading corner in the classroom	School Head Teachers Reading Coordinator Grade level Chairman Parents PTA Officers	August-January	2,000.00	MOOE Canteen fund	Reading area in each classroom with printed reading materials in different level of comprehension literal Inferential Application Critical
Special Program	Capacity building for parents and parent volunteers in facilitating reading at home	To train parents and parent volunteers on facilitating reading calendar at home	School Head Teachers Reading Coordinator Grade level Parents Guardians	September	1,000	Canteen	100% of parent attendees and parent volunteers display ability in facilitating the reading calendar

CONCLUSIONS

The level of performance of Grade 1-3 MTB-MLE classes in terms of activating schema and prior knowledge; comprehension of literary text; comprehension of informational text; and attitude toward language, literacy, and literature is very satisfactory based on the teachers' assessment.

More than 50% of students in each school scored less than 14 (score< 14) in the group screening test (GST), regardless of district affiliation and school population category.

The effects of the mother tongue as a language of instruction from Grades 1-3 on the reading comprehension of Grade 4 students include: poor or low comprehension in English; difficulty in reading English words; frequent translation of words from English to mother tongue (Filipino); and inability to express thoughts and ideas. Mother tongue-based instruction may improve students' performance in subjects taught in Filipino (Tagalog), but it has a negative impact on students' speaking and reading comprehension in English classes due to too much exposure in the mother tongue during Grades 1-3 classes.

Most teachers believed that bilingual instruction is still better and more effective in training students to comprehend and converse in both their mother tongue and English. Moreover, children learn faster through listening to English speakers and speaking the language, but since the mother tongue is the language of instruction from Grades 1-3, the English speaking and reading proficiency of Grade 4 students was hampered.

RECOMMENDATIONS

Language is a tool in academic development. If the Department of Education (DepEd) wants to pursue the competitiveness of Filipino learners in the global arena, English must be introduced as early as Grade 1. Expertise in the English language may be achieved through practice, so during the foundation period, bilingual instruction is recommended.

The teaching of MTB-MLE may be continued as it showed a positive impact on the mastery of the child in their mother tongue. However, modifications must be made in terms of the language of instruction.

In teaching other subjects, it is recommended to use a bilingual language (Filipino and English) so the learner will be used to speaking English during classes. Practice makes perfect. If the child were able to hear and speak English words from Grade 1, they would not have difficulty understanding instructions in English.

Intensive remediation in reading English texts may improve the comprehension level of grade 4 students. Preparation of an annual reading intervention plan may ensure better reading performance.

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CTE STUDENTS' CYBER SLANG USE VIS—VIS SOCIAL MEDIA EXPOSURE: TOWARDS ACADEMIC WRITING CONVENTIONS

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ABSTRACT

Utilizing the descriptive-correlational design, this study gathered information on the level of exposure and usage of cyber slang on social media among college freshmen students. It also assessed students' proficiency in academic writing conventions such as spelling, punctuation, and abbreviation, as well as grammar and formality. According to the study, freshmen students were interpreted as having a high level of social media exposure. Students' use of cyber slang on social media was also interpreted as high. The students' level of competence in academic writing conventions in spelling was at a competent level. They were proficient in punctuation and abbreviation. Grammar was at a competent level for them. In terms of writing formalities, they were competent. They were still at a progressively competent level. The social media exposure did not significantly relate to their level of academic writing conventions. On the other hand, the level of cyber slang is significantly related to the student's level of academic writing conventions. The study concluded that the results showed that there is a moderate positive correlation between students' cyber slang usage and their academic writing conventions, which means that cyber slang usage on social media significantly affects the academic writing conventions of students; thus, the more they are exposed to cyber slang, the more they tend to use it in their academic writing.

Keywords: cyber slang, social media, academic writing conventions, spelling, punctuation and abbreviation; grammar and syntactic structure formality

INTRODUCTION

One of the most important and significant goals of education is to teach students how to think and write critically through the help of the five macro skills, namely: listening, speaking, reading, writing and viewing. The last skill was just added recently. Among these skills, writing is the most used and most important tool that every student must possess since all subject areas require this competence in writing. Furthermore, it really helps the learners to achieve greater success in academic and in achieving the communicative competence in the English language. As Bowker (2007) stipulates, writing is a skill that is required in many contexts throughout life. Because through this, one can make reports, write essay, write an email to a friend, and reflect on what happened during the day in a personal diary or write essay for homework.

Jones (2011) also states that academic writing should be mastered by students because in every learning area, students are required to respond, argue, critique, and explain in essay form. Another is the idea of Sanford (2012) which explicates that writing extends beyond syntactic skills of punctuation and grammar. It is also a complex intellectual activity that requires students to think critically. In writing, one does not simply demonstrate his language competence and knowledge with accurate grammar, punctuation and so on, but it shows the writer's intellectual flexibility, maturity, and personality.

Meanwhile, it should be highlighted that the majority of students today are millennials who often connect with online sources (Lenhart et al.

2007). Social media has resulted in a new type of communication, which has resulted in a variety of Englishes. Everything must be quick and simple for millennials. As a result, when they communicate, they diverge from traditional English grammar. Furthermore, as technology evolves, the world is concerned about efficiency and effectiveness, which is why students' use of social media has prompted concerns about its impact on their literacy skills. The technology created modern-day conversational writings have resulted in the introduction of new spellings and informal writing (Tabuashvili, 2012).

Whereas, this has tends to result in what is now known as Textism, which refers to the use of abbreviations and other techniques to compose SMS and instant messages and has become a familiar routine for everyone, and it can be considered the fastest growing style of electronic communication that is frequently used in Computer Mediated Communication (CMC). The widespread usage of acronyms today generally violates standard English writing and spelling conventions. Furthermore, students cannot be able to differentiate formal language from informal language as more often than not, even in the tertiary level some of the students, are inclined to use improper formats and sentences that stultify Standard English. This particular peculiar occurrence has given rise to Internet slang/ Cyber slang. Those lacking English proficiency may be affected as they will have the tendency to imitate and this case, imitate improperly. And this phenomenon was largely due to the proliferation of mobile phones as well as internet based instant messaging (IM). In other words, technology is considered as the origin of this (Vosloo, 2009).

This emerging phenomenon has piqued the interest of researcher, who are investigating the impact of social media usage and the use of cyber slang on students' academic writing conventions, particularly on their grammar, spelling, punctuation, and abbreviations, as well as their writing formality.

STATEMENT OF THE PROBLEM

This study aimed to determine the level of students' exposure to social media and the level of students' usage of cyber slang on social media, as well as their level of academic writing convention, and to see if there was a significant relationship between freshmen students. The study's goal was to find answers to the following questions:

1. What is the level of students' exposure in social media?
2. What is the level of students' usage of cyber slang in social media?
3. What is the level of students' academic writing conventions in terms of:
   3.1 spelling;
   3.2 punctuation and abbreviation;
   3.3 grammar;
   3.4 syntactic structure formality?
4. Is there a significant relationship between students' social media exposure and students' academic writing conventions such as:
   4.1 spelling;
   4.2 punctuation and abbreviation;
   4.3 grammar; and
   4.4 syntactic structure formality?
5. Is there a significant relationship between level of students' usage of cyber slang in social media and students' academic writing conventions such as:
   5.1 spelling;
   5.2 punctuation and abbreviation;
   5.3 grammar; and
   5.4 syntactic structure formality?
6. What is the implication on the exposure of social media and the use of cyber slang in social media to students' academic writing conventions?

Studies on Cyber Slang and Social Media Exposure: Towards Academic Writing Conventions

Based on the review of research studies on Social Media Exposure, Craig (2003) stated social media exposure also threatens students' literacy because it creates undesirable reading and writing habits due to common use of abbreviations and unusual jargon, thereby damaging students' ability to employ formal literacy skills. Text messaging is deemed to be detrimental to students' language proficiency since students mix this "text language" with the standard language they learn at school. Consequently, students displayed numerous errors ranging from incorrect spellings to "ungrammatical" sentence constructions. Meanwhile, he also discussed some positive outcome, such as: First, online communication is fun and encourages students to play with language without having to worry about spelling conventions. This, in turn, might positively affect students' attitudes towards other activities associated with literacy. Another, cyber slang increases

to students' exposure to text, which in turn is related to better reading skills for they would have more time to reread their writings about its structure and correct if it is necessary.

The different media used on communication such as (SMS, chat, instant messaging…) require a certain adaptability to writing. Moreover, the new constraints of these communications (according to a limited number of characters, such as the speed of communication) require short and fast sentences to write. This gave rise to a new type of writing: cyberslang. The latter presents very special characteristics explained in the article by Bouillaud, Chanquoy and Gombert (2007), namely, the absence of capital letters at the beginning of the sentence, a very reduced punctuation despite its essentially expressive function, the use of logograms, the absence of syntax and the recoding of words according to phonological criteria only.

This has been asserted in the study of Boyd, D., and Ellison (2007), who said that the use of cyberslang can greatly impact the conventional writing of the subjects. Furthermore, we can see that cyberslang is spreading on a regular basis through various channels of communication, such as television and its commercials, newspapers, and even some university professors' courses. As a result, we believe that a rising number of people are in more or less direct and frequent contact with this.

These concepts were also asserted in the research of Liu, Y. According to (2010) and Kamnoetsin, Tharinee (2014), young students (18/28 years old) are the most frequent users of cyberlanguage. In addition to the study of (Schleppegrell, 2001, 2004). Where he stated that learning to successfully write academic genres that are valued in schools represents a specific difficulty for adolescent English Language Learners, he failed to mention that academically-valued writing is an essential language and literacy skill that must be attained for adolescent ELLs to gain access to post-secondary education and career opportunities (Colombi & Schleppegrell, 2002).

This study is essential because it provides an in-depth understanding of whether there is a significant relationship between students' level of social media usage and the use of cyber slang on students' academic writing conventions, specifically grammar, spelling, punctuation, and abbreviations, as well as writing formality. As a result, it would serve as a wake-up call for language instructors in the area, heightening their desire to improve pedagogical abilities as well as topic mastery in academic instruction. As well as the students, who may raise a warning due to their excessive use of Social Media, which occasionally leads to the use of Cyberslang.

RESEARCH METHODOLOGY

This study utilized the descriptive-correlational design to gather information on the level of competence of the Freshmen students in the academic writing conventions in spelling, grammar, punctuation and abbreviations and writing formality and their level of Social Media Exposure and usage of Cyber Slang.

Moreover, the respondents of the study were the 45 Freshmen students enrolled in Bachelor of Technology and Livelihood Education under the College of Teacher Education, during their First semester in the S.Y 2019-2020. They were randomly selected based on the criteria set by the researchers. As such, these respondents were able to qualify to partake in the inquiry process.

Further, the researcher ensured that accurate data will be gathered. As such, they utilized several instruments in collecting data, as follow:

Research Instruments

In gathering the needed data, the following research instruments were used:

A. Writing Proficiency Diagnostic Essay

The students' writing ability was tested by asking them to write an essay regarding some prevailing issues in the Philippines, given a minimum of 300 words and a maximum of 400 words. Using the adopted and modified Gustillos' (2013) point essay scoring guide, the essays were rated by two raters (the researcher and another teacher) who have been licensed in teaching and have a master's degree. The scoring guide followed a rubric (domain) which was used to rate the essay as a whole in terms of spelling, abbreviation, punctuation, grammar, and formality of text.

B. Survey Questionnaires

The survey instrument used in this study was adopted and modified from the EU Kids online survey and other web resources which have been made publicly available to researchers.

C. Writing Proficiency Essay

The students' writing ability in academic writing conventions was tested by asking them to

write an essay regarding the prevailing issue in the Philippines, given a minimum of 400 words. Using Gustillo's essay scoring guide, which has been adopted and modified,The essays were rated by two raters (the researcher and another licensed holder teacher) who have both finished their Master of Arts in Teaching-English. The scoring guide was used to rate the different parts of the essay needed in the study, namely: spelling (correct usage of capitalization and spelling); punctuation and abbreviation (correct usage of punctuation and abbreviation rules); grammar (appropriate choice of vocabulary and correct usage of English grammar); and writing formality (written in an appropriately formal and making use of different sentence patterns). The rubric used in the study has a minimum score of 1 and a maximum score of 4 for each of the two raters (a total score of 32 in all).

Additionally, the following were the procedures undertaken in the process of Data Gathering:

1. The researcher discussed and explained the different indicators on the survey questionnaires in order to know the level of students' exposure to social media and the level of students' usage of cyber slang on social media.
2. The researcher floated the essay topic (soft drinks should be banned in schools) to the freshmen students and discussed the rubrics that served as their guide in conceptualizing their thoughts and ideas.
3. The researcher, together with her inter-rater, rated the essays of the students.
4. Immediately after the table results were obtained, analysis and interpretation commenced, and the writing of Chapters IV and V followed.

Finally, in order to analyze and interpret the data, the following statistical tools were used:

1. A computation of the mean percentage was done in determining the level of students' exposure on social media. used a close-ended questionnaire composed of 15 items (with four Likert Scale responses–4-always, 3-oftentimes, 2-sometimes, 1-never);
2. A computation of the mean percentage was done in determining the level of students' usage of cyber slang on social media. and used a close-ended questionnaire composed of 15 items (with four Likert Scale responses –4-always, 3-oftentimes, 2-sometimes, 1-never);
3. In determining the level of students' academic writing conventions in terms of spelling, punctuation, and abbreviation, grammar, and varied structures of formality, computation of mean percentage was done.
4. In giving the appropriate qualitative descriptions for individual items in their essay, the following mean percent scale and qualitative descriptions were used following this scale: Not Competent: 1.00-1.74; Progressionally Competent: 75-2.49; Competent: 2.50-3.24; Highly Competent: 3.25-4.00
5. And in determining the relationship between students' social media exposure and academic writing conventions, the Pearson correlation was used; and
6. Lastly, to represent the significant relationship between the level of students' usage of cyber slang in social media and students' academic writing conventions, the Pearson correlation was used.

RESULTS AND DISCUSSION

The following discussions present salient findings of the research.

Section I: The Level of Students' Exposure in Social Media

The level of students' exposure to social media was rated on a 4-point scale. The indicators, with their corresponding mean, standard deviation, and qualitative description, were used to describe the level of students' exposure on social media. The indicators "Read a pdf of an academic journal article, book chapter or ebook", "Send/ receive an email to do with college work", "Spend time in a virtual world (e.g. World of Warcraft, Second Life, Mobile Data)," "Post a message on a website like Facebook, Instagram", and "Put or post photos, videos, or music to share with others" have their corresponding mean values of 2.27 (0.62), 2.22 (0.64), 2.02 (0.66), 2.20 (0.76), 2.18 (0.68). All of which have a qualitative description of sometimes. Most respondents rated the indicators "playing digital games on your own or against the computer" and "writing a blog or diary entry" as "never". This was based on their corresponding mean values of 1.47 (0.87) and 1.47 (0.89). The indicators "Collaborate with other students through social media", "Use social media to do research for an assignment", "Use file shar-

ing sites", "Read/watch the news or current affairs programs online", "Use a social media site (e.g. Facebook, LinkedIn, Instagram) and "Use a camera for learning purposes" and "Use a camera for video communication (e.g., Skype, Snap Chat)" is "often." These finding were based on their corresponding mean values of 2.64 (0.80), 2.82 (0.53), 2.71 (0.59), 2.82 (0.53), 3.00 (0.64), and 2.64 (0.91). This implies that the freshmen students were often observed using social media sites such as Facebook, Instagram, etc., which are intended for socialization and learning. The indicators "Use instant messaging like messenger" and "Watch music, broadcast TV, You Tube, or films online" were rated "always" as its qualitative description. This finding was based on their corresponding mean values of 3.51 (0.82) and 3.44 (0.76). These findings imply that the students would always be observed using instant messaging like Facebook Messenger and watching videos on YouTube. Facebook Messenger offers free data, and YouTube also offers free offline downloads that can be used by students without consuming mobile load. And in general, the students' level of exposure on social media was described as low.

It is undeniable that the majority of students who live in this area come from low-income families where most parents cannot afford to provide them with necessities such as gadgets. Hasan et al. (2007) pointed out that students living in rural areas might only have a low-to-high level of exposure on social media compared to those students in urban areas, whose level might have reached its highest level because the majority of them come from high-income families who could be able to sustain their needs.

Section 2: The Level of Students' Usage of Cyber Slang in Social Media

The indicators "I express emotions on the internet through typing," "I use slang words in day-to-day speech," and "I tend to insult and show my anger by expressing it with slang words" have "sometimes" as their qualitative description. These findings were based on their corresponding mean values of 2.44 (0.76), 2.11 (0.75), and 2.31 (0.90). The indicator "I type differently when I'm interacting with people" got the highest mean value of 3.33 (0.93) with "always" as its qualitative description. This implies that when texting, the freshmen students will always type the words differently. Students usually misspell the words, just to make texting easier and faster. In general, the students' level of cyber slang usage is high.

The results show that cyber slang is becoming popular among the millennial generation. Students do not mind grammatical structure, appropriate punctuation, and correct spelling—all for the sake of comfort and speed. Several studies argue that millennials are destroying formal writing skills such as grammar, syntax, punctuation, and capitalization.

However, Humphry (2007) defended the reasons why people no longer use the appropriate language in communication; instead they prefer the use of abbreviations when communicating, all for the sake of convenience and speed, which might be beyond their control. Cyber slang does not cause bad spelling because people know how to spell before online communication. Instead, it improves people's literacy because it provides people with the opportunity to engage in the language through reading and writing.

Section 3: Level of students' academic writing conventions

	Mean	Std. Deviation	QD
Formality	2.33	0.56	Progressively Competent
Grammar	2.36	0.48	Progressively Competent
Punctuation	2.42	0.75	Progressively Competent
Spelling	2.29	0.55	Progressively Competent
Overall	**2.35**	**0.59**	**Progressively Competent**

Legend: Not competent 1.00-1.74; Progressively Competent 1.75-2.49;

The table below shows the level of students' academic writing conventions in terms of spelling, punctuation, grammar, and formality. The indicators were rated on a 4-point likert scale using the following qualitative description: incompetent; gradually competent; competent; and highly competent.

The mean values that correspond to formality, grammar, punctuation, and spelling are 2.33, 2.36, 2.42, and 2.29, with their qualitative description of progressively competent.

In general, the overall performance of the freshmen students was progressively competent, which is based on its mean value of 2.35. Therefore, the freshmen students' academic writing conventions need to be improved. And much had to be done to improve their skills and that development activities in the various subjects, especially in the English courses, be done to hone the students' skills in writing.

Sample qualitative extracts from the students' essays are presented to explain the progressive competency level of the students. For purposes of clarity, the essays were encoded as is: On the top-

ic given "soft drinks should be banned in school", student X (not his real name), a student-respondent, wrote the following.

> *Soft drinks are very popular among students. As a common knowledge, soft-drinks are very popular among student. Soft drinks is a carbonated drink with lots of Carbon Dioxide and sugar it gives an efect in one person. Students shuld not drink soft drinks becuase it raise major health of crisis and it as terrible dissease on kiling our body. Then soft drinks contains many unwanted ingrediens. It has a major to afect the parts of your bodies, like diabetics, pancreatic cancer and so on.*
>
> *Thats' when a person drinks a softdfrinks they can not look on how it will afect of them.. Its' poison, it contains chemical's which are harmfull to our body. Soft drinks cause a lot of painful it may cause a large problems that includes alcohol and drugs and it may loss your memory that can reduce the life expectancy in individual persons.*
>
> *Thats why, the health risk drinking soft drinks is you will get many disease that may affect health. I conclude that student likes me should limit drinking soft drinks and also their parents should educate their children not to drink soda.*

The inter-raters agreed that the student was in favor of banning soft drinks in the school based on the students' idea that drinking soft drinks endangers the health of a person.

In terms of ***spelling*** this essay got a 1-2 score from the two teacher inter-raters. Based on the rubric, a score of 1 meant that there are excessive errors in spelling and mechanics meanwhile 2 means errors are present that interfere with the presentation of ideas. This could be seen in the following line: (*Soft drinks is a carbonated drink with lots of Carbon Dioxide and sugar it gives an efect in one person. Students shuld not drink soft drinks becuase it raise major health of crizis and it as terrible dissease on kiling our body. Then soft drinks cuntains many un wanted ingrediens. It has a major to afect the parts of your bodies, like diabetics, pancreatic cancer and so on.*)

The spelling should be clear and accurate in order to present a productive idea. This meant that there was still a room for improvement in the aspect of spelling among the students. Overall, the score was 3 out of a total of 8 (each inter-rater can give a maximum score of 4, which is the highest score, and a minimum of 1, which means the lowest score). Thus, if there were two inter-raters, the maximum average score was 8, while the lowest was 2. And this is one of the impacts of excessive use of social media and use of cyber slang in chatting or texting. Students' writing academic performance is getting low. It is most astonishing to note that even though the students are aware of the dangers associated with the use of SMS slang, especially during examinations, they still cannot stop it because they incautiously use it. However, the use of SMS slang can be overcome if only its users adopt the use of only simple and correct English when doing so.

That's why students need to expose themselves through continuous reading and by using the difficult words in their everyday conversation to familiarize themselves with their meanings and correct usage in sentences. Williams, Walker, Vaughn, and Wanzek (2016) articulated that spelling is one of the most challenging areas for students, especially those with learning disabilities. Spelling is a developmental process that involves a combination of code-based skills. For most students, spelling begins with phonemic awareness instruction, where students develop the ability to hear and manipulate the sounds in spoken speech. The ability to segment words into phonemes is a predictor of spelling achievement (National Institute of Child Health and Human Development, 2000). Students needed to know the names of the letters of the alphabet and to recognize that those letters have direct associations with the sounds, which is known as the alphabetic principle (Vacca et al., 2006). This leads to phonological awareness and the understanding that phonemes could be related to graphemes.

Considering the foregoing ideas, it was possible that the freshmen level was still seen as dismal when one considered their current year level. They were already at the tertiary level. Putting together the freshman students' current competency levels in spelling could explain their depressing level of competence in their academic writing conventions.

In terms of ***punctuation and correct usage of Abbreviation***, this essay got a score of 2-2 from the teacher inter-raters. This meant that errors are present that interfere with the presentation of ideas. "*Thats' when a person drinks a softdfrinks they can not look on how it will afect of them.. Its'*

a poison, it contains chemical's which are harmfull to our body". Indeed, the used of punctuations were evident in this statement but it was not properly used.

In terms of ***grammar*** (*Appropriate choice of vocabulary and correct usage of English Grammar*) this essay got a score of 2-2. A score of 2 meant that the essay was composed of simplistic sentence structure and imprecise use of language. (example is the line: *Thats why, the health risk drinking soft drinks is you will get many disease that may affect health. I conclude that student likes me should limit drinking soft drinks and also their parents should educate their children not to drink soda*). This line was not able to connect the claim or ideas to the ground clearly because of the grammar flaws.

In terms of ***Syntactic Structure Formality*** (Written in an appropriately formal and making use of different sentence pattern), this essay got a score of 3-3, where a score of 3 meant that uses of slang, jargon, or inappropriate language are not evident. These ratings, which were based on the prepared rubric, given by the inter-raters were common to all the student-respondents in their writing academic conventions. In general, the overall performance of the freshmen students was progressively competent which is based on its mean value of 2.35.

This might have a well grasp on the subject matter of the banning of soft drinks in school. This was affirmed by Chase (2011) when he conducted a study to determine the writing skills of low achieving post-secondary students. Using an archival data set, a sample of argumentative essays written by community college developmental (remedial) education students were analyzed. One result of the study indicated that the written components of the argumentative essays and the demographic characteristics of the writer, including his readiness and mood, when combined, significantly contributed to the overall quality of the argumentative essays.

Frederick (2015) stated that writing simply would not be writing without the rules that shape words and string together sentences into fluid paragraphs and comprehensible arguments. He argued that in spite of the prevalence of writing in everyday lives, proper grammar is not given emphasis. Learners were trained with the rudiments of grammar in the elementary and high school. They learned it from core language courses. But apparently, some learners still could hardly make comprehensible ideas in both oral and written communication. Frederick (2015) further stipulated that perhaps writing informally is convenient, but it is certainly not practical. Correct grammar serves explicit and implicit functions that extend to how people structure their thoughts. The conclusions that young students could draw from grammar studies teach them the valuable tool of deductive reasoning. In fact, it is through grammatical structure that people learn how to create strong arguments in their writing.

Section 4: Summary of correlation between the level of students' exposure in social media and level of students' academic writing convention

	level of students' exposure in social media		
level of students' academic writing convention	**r**	**p-value**	**remarks**
Spelling	-.30*	0.05	significant
Punctuation	-0.16	0.31	insignificant
Grammar	0.02	0.99	insignificant
Formality	-0.12	0.43	insignificant
Overall	**-0.02**	**0.89**	**insignificant**

** Correlation is significant at the 0.01 level
* Correlation is significant at the 0.05 level

The table illustrates the relationship between the students' level of exposure on social media and their level of academic writing conventions such as spelling, punctuation, grammar, and formality. The p-values that correspond to punctuation, grammar, and formality were 0.31 (r = -0.16), 0.99 (r = 0.02), 0.43 (r = -0.12), and 0.89 (r = -0.02), which suggests insignificance. Meanwhile, spelling was found to be significant to the students' level of exposure on social media. This is based on the p-value of 0.05 (r = -0.30). The negative correlation value of -0.30 implies that the higher the students' level of exposure, the lower the level of their academic writing conventions in terms of spelling. Hence, the degree of relationship is weakly negative, as indicated by its value (r = -0.30).

The p-value that corresponds to the overall result is 0.89 (r = -0.02), which is higher than the 0.05 level of significance. Therefore, the null hypothesis is accepted. The students may have high- or low-level academic writing conventions, but it should not be associated with the students' level of exposure on social media.

The results of the study show that there is a moderate positive correlation between students' exposure to social media and their academic writing conventions. The more the students are exposed to social media, the more this variable influences the academic writing of the students.

Researchers like Craig (2003) suggest different reasons for the positive association. First, online communication is fun and encourages students to play with language without having to worry about spelling conventions. This, in turn, might negatively affect students' attitudes towards other activities associated with literacy.

Section V. Summary of correlation between the students' level of usage of cyber slang in social media and level of students' academic writing convention

	level of students' exposure in social media		
level of students' academic writing convention	**r**	**p-value**	**remarks**
Spelling	-0.54**	0.01	significant
Punctuation	-0.30*	0.05	significant
Grammar	-0.68*	0.04	significant
Structure Formality	-0.02	0.90	insignificant
Overall	**-0.63***	**0.04**	**significant**

*. Correlation is significant at the 0.05 level
**. Correlation is significant at the 0.01 level

The p-values that correspond to spelling, punctuation, and grammar were 0.01 (r = -0.54), 0.05 (r = -0.30), and 0.04 (r = -0.68), which are remarked as significantly related to the students' level of usage of cyber slang in social media. This implies that the higher the students' level of usage of cyber slang in social media, the lower the level of their academic writing conventions in terms of spelling, punctuation, and grammar, as indicated by the negative r-values. However, formality was found to be not significantly related to the students' level of usage of cyber slang in social media. This is based on the p-value of 0.90 (r = -0.02), which is higher than the 0.05 level of significance.

In general, the students' level of usage of cyber slang in social media and the level of their academic writing conventions were found to be significantly related. This finding was based on a p-value of 0.04 (r = -0.63), which is lower than the 0.05 level of significance. Therefore, the null hypothesis is rejected. This implies that a student's level of academic writing convention is associated with the level of their usage of cyber slang in social media.

The results of the study showed that the correlation between students' cyber slang usage and their academic writing conventions is significant, which signifies that cyber slang usage on social media significantly affects the academic writing conventions of students; thus, the more they are exposed to cyber slang, the more they tend to use it in their academic writing. And this was concluded by Thurlow (2004), who stated that slang words affect English rules and grammar. English grammar has not changed over the years, although each generation creates its own jargon.

SUMMARY

Utilizing the descriptive-correlational design, this study gathered information on the college freshman students' level of exposure to and usage of cyber slang on social media. It also determined the student's level of competence in academic writing conventions in spelling, punctuation, abbreviation, grammar, and formality. The study revealed that in terms of the level of students' exposure to social media, freshmen students were interpreted as having high exposure. The level of students' usage of cyber slang on social media was also interpreted as high. The students' level of competence in academic writing conventions in spelling was at the competent level. They were at the competent level in punctuation and abbreviation. They were at the competent level in grammar. They were at the competent level in writing formality. They were still at the progressively competent level. The social media exposure did not significantly relate to their level of academic writing conventions. On the other hand, the level of cyber slang is significantly related to the student's level of academic writing conventions.

CONCLUSION AND RECOMMENDATIONS

It must be noted that instead of looking at social media sites as structures for making mistakes with the emergence of cyber slang, we have to look at this avenue for catching mistakes. Think of it as an opportunity to proofread, which will later on develop the critical analysis skills of our students. The fact that cyber slang would even allow creativity among the students through the improvement of new words and encourages imperative wondering abilities in order to deliver messages in a shorter timeframe is a fact worth considering. For social media suggests the value of short story telling, which requires some degree of creativity—the shorter, the better. Therefore, it can be inferred further that social media sites and the utilization of cyber slang will pose academic challenges and social acceptance decisions among the students who set limits as to when and when

not to use them. With the proper guidance and usage of technology, students will be positively encouraged to produce tremendous ideas and thoughts.

Lastly, teachers may be more open-minded and adaptable when it comes to students' exposure to social media and use of cyber slang. They must use this as an opportunity to emphasize the importance of formal communication on social media platforms so that students can develop and improve their writing skills. Furthermore, they must effectively teach their pupils and assist them in understanding the use of social networking sites. As a result, students may be aware of the consequences of their prolonged exposure to social media. Likewise, they must understand and choose when to use the language responsibly in school and in society. They will be able to make appropriate choices in order to achieve along the way without sacrificing their writing ability. Also, parents can watch their children and provide instruction on the proper use of social media to aid and deepen their participation in the class.

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TEACHER'S APPROACHES AND GRADE SIX PUPILS' MATHEMATICS ATTITUDE

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ABSTRACT

Mathematics learning and quality teaching have been educators' significant challenges and concerns for ages. The current debate among scholars is what pupils should learn to be successful in mathematics. The central issue is how to provide instructional environments, conditions, methods, and solutions that achieve learning goals for pupils with different skills and ability levels. Pupils' negative attitudes towards mathematics play a vital part and are among the reasons for being unsuccessful. This study examines the evidence of how teachers' approaches influence the pupils' mathematics attitude and the possible relationship between them. The findings of the study revealed that, in general, the teacher "believes that the students will be successful in Mathematics," "organizes the appropriate learning environment," and lastly, "appreciates students' ideas and improvements." To male respondents, the teacher "gives examples for the subjects to be comprehended better," "appreciates students' ideas and improvements," and "believes that the students will be successful in mathematics." However, to female respondents, the teacher "believes that the students will be successful in mathematics," "organizes the appropriate learning environment," and "uses instructional tools other than the board and chalks." Results also showed that both male and female respondents generally and when grouped as to sex have "positive" Mathematics attitudes. However, the result showed no significant relationship between the teacher's approaches and the pupils' mathematics attitude.

Keywords: teacher's approaches, pupils' mathematics attitudes, attitudes, approaches

INTRODUCTION

Mathematics learning and the quality of teaching have been one of educators' major challenges and concerns for ages. Like in the past, most people today still associate mathematics with computation. However, for mathematicians, computation is merely a tool for comprehending mathematical concepts' structures, relationships, and patterns, producing solutions for complex real -life problems. Mathematicians' perspective has gained more attention and importance with rapid advancements in information and communication technologies. It has become necessary for people of all ages to reach, analyze, and apply mathematical knowledge efficiently and effectively to be successful citizens in the new era. Specifically, students need to be well-equipped with higher-order mathematical understanding. Mathematics learning and quality teaching are significant challenges for educators of the world.

Scholars were currently debating what students should learn to be successful in mathematics. The discussion emphasizes new instructional design techniques to produce individuals who can understand and apply fundamental mathematic concepts. A central and persisting issue is how to provide instructional environments, conditions, methods, and solutions that achieve learning goals for pupils with different skills and ability levels.

Neale (1969) in Elçi (2017) defined the attitude towards mathematics as a person's tendency to like or hate mathematics, deal with or avoid mathematical activities, believe in being successful or not in mathematics, or believe that mathematics was helpful or not.

Pupils' negative attitudes towards mathematics play a vital part and are among the reasons for being unsuccessful. Many researchers contend that attitudes are essential factors influencing a

pupil's achievement (Papanastasiou and Papanastasiou, 2005 as cited in Elçi (2017). However, many pupils thought mathematics was a complex subject, and they were concerned that they could not succeed in mathematics, which negatively affected their attitudes towards mathematics (Alkan, Bukova–Güzel, 2004 in Elçi 2017).

Unfortunately, this opinion continues during school years. As a result, some pupils have negative attitudes towards mathematics, and thus they may lose their self–confidence in mathematics. Moreover, pupils may begin to think that they are not clever enough to learn mathematics and may not regard mathematics as their area of interest, depending on many factors. Still, mathematics teachers' instructional approaches, roles, teaching methods, and attitudes towards mathematics are essential in this misunderstanding.

In the Philippines, the sole memorization with devoid understanding causes the most failure in Mathematics. Pupils lack the application of techniques and skills that helped them develop their critical thinking, reasoning power, and creative minds in working independently in all sorts of activities in Mathematics. Pupils quickly get bored in solving numbers during their Math period as observed and enjoy more in ARTS and more behaved in doing art activities independently. The 2013 National Achievement Test (NAT) results in Mathematics are 66 .32 %, increasing after a year to 68.82%. Though it increased, it still did not reach the 75% standard level (Wallit, 2016).

As to the current scenario in school, one of the major concerns of the researcher was pupils' attitude towards the subject and poor performance in Mathematics.

With the above premise and the researcher's desire to help improve pupils' performance in Mathematics, this study was conducted.

STATEMENT OF THE PROBLEMS

This study aimed to determine the teachers' approaches and mathematics attitude of grade six pupils of Dumangas Central Elementary School for the School Year 2021-2022.

Specifically, the study seeks answers to the following questions:

1. What are the three prevalent teachers' approaches as a whole and when grouped according to Sex?
2. What is the mathematics attitude of the respondents as a whole and when grouped according to Sex?
3. Is there a significant relationship between teachers' approaches and the mathematics attitude of the pupils?

METHODOLOGY

The present study was descriptive-correlational. Conducted at Dumangas Central Elementary School located at Poblacion, Dumangas, Iloilo. The sample size is the school's 15 Grade six pupils, where 7 or 46.67% were boys and 8 or 53.33% were girls. The sample size was 15 elementary pupils studying at Dumangas Central Elementary School. Due to the pandemic, the respondents were chosen using convenience sampling. This study utilized two sets of adapted questionnaires: Mathematics Attitudinaire (surveymonkey.com) and the Mathematics Teachers' Approaches Questionnaire (Elçi, et al., 2004). Mathematics Attitudinaire comprises a 20-item Likert-type questionnaire checklist answerable with the following scale and description: 1-Strongly Disagree, 2-Disagree,3- Neither Disagree Nor Agree, 4-Agree, and 5-Strongly Agree.

The Mathematics attitude will be interpreted using the following scale and description:

Scale	Description
4.20 – 5.00	Very Positive Attitude. This means that the respondents are highly interested and impressed in Mathematics.
3.40 – 4.19	Positive Attitude. This means that the respondents are interested in Mathematics.
2.60 – 3.39	Fairly Positive Attitude
1.80 – 2.50	Negative Attitude. This means that the respondents are not interested in Mathematics.
1.00 – 1.79	Very Negative Attitude. This means that the respondents are not interested and impressed in mathematics.

The Mathematics Approaches questionnaire comprised a 15-item questionnaire checklist answerable with the following scale and description: 1-Strongly Disagree, 2-Disagree,3- Neither Disagree Nor Agree, 4-Agree, and 5-Strongly Agree and are interpreted using the mean scores.

The research instruments underwent validation by the experts and reliability tests. After incorporating the modifications, corrections, and seeking prior permissions, the instrument was reproduced and given to the respondents to solicit

their responses. Before administering the questionnaires, the pupil respondents were informed of the purpose of the study. They were given the lay way to withdraw participation and assured that the data gathered would be treated with the utmost confidentiality. The data gathered were collected, tabulated, and interpreted with appropriate statistical treatment using the mean, standard deviation, and Spearman's rho coefficient of correlation.

FINDINGS

Results revealed that generally, the teacher "believes that the pupils will become successful in mathematics" ranked first with the mean of 4.07, followed by "organizes the appropriate learning environment" ranked 2nd with a mean of 3.87 and lastly, "appreciates students' ideas and improvements" ranked 3rd with a mean of 3.73. Results are shown below.

Prevalent Teachers' Approaches as a Whole

The teacher…	Mean	Rank
gives examples for the subjects to be comprehended better.	3.33	
encourages pupils to do mathematical investigations.	2.33	
organizes the appropriate learning environment.	3.87	**2nd**
asks pupils to make predictions in problem-solving.	1.80	
relates a mathematical concept.	3.00	
is interested in the pupils ' mathematical improvement.	2.20	
believes that pupils will become successful in mathematics.	4.07	**1st**
provides active participation of the pupils in lesson.	2.00	
relates mathematical subjects and concepts with the real world.	2.67	
prefer to use instructional tools than the board and chalks.	3.07	
presents different learning approaches during the lesson.	3.40	
utilizes different problem solving approaches.	1.93	
acts neutral towards pupils.	3.53	
harshly criticizes when pupils make mathematical mistakes.	2.60	
appreciates pupils ideas and improvements.	3.73	**3rd**

For male respondents, the teacher "*gives examples for the subjects to be comprehended better*" and "*appreciates students' ideas and improvements*" tied in ranked 1.5 with means of 4.71 and the teacher "*believes that the students will become successful in mathematics*" ranked 3rd with a mean of 4.57 according to male respondents. However, as to female respondents, the teacher "*believes that the students will be successful in mathematics*" ranked 1st with a mean of 3.63, "*organizes the appropriate learning environment*" ranked 2nd with a mean of 3.50 and "*uses instructional tools other than the board and chalks*" ranked 3rd with a mean of 3.13. Results are shown below.

Prevalent Teachers' Approaches as to Sex

The teacher…	Male		Female	
	Mean	Rank	Mean	Rank
gives examples for the subjects to be comprehended better.	4.71	**1.5**	2.13	
encourages students to do mathematical investigations.	1.57		3.00	
organizes the appropriate learning environment.	4.29		3.50	**2nd**
asks students to make predictions in problem-solving.	1.57		2.00	
relates a mathematical concept.	3.43		2.63	
is interested in the students' mathematical improvement.	1.71		2.63	
believes that the students will become successful in mathematics.	4.57	**3rd**	3.63	**1st**
provides active participation of the student in lesson.	1.71		2.25	
relates mathematical subjects and concepts with the real world.	3.14		2.25	
prefer to use instructional tools other than the board and chalks.	3.00		3.13	**3rd**
presents different learning approaches during the lesson.	4.14		2.75	
utilizes different problem solving approaches.	1.29		2.50	
acts neutral towards students.	4.43		2.75	
harshly criticizes when students make mathematical mistakes.	2.14		3.00	
appreciates students ideas and improvements.	4.71	**1.5**	2.88	

Generally, pupils have "positive attitude" towards mathematics with a mean of 3.93. When grouped as to Sex, both male and female respondents have "positive attitude" towards mathematics with means of 4.11 and 3.78 respectively. Results are shown below.

Generally, pupils have "positive attitude" towards mathematics with a mean of 3.93. When grouped as to Sex, both male and female respondents have "positive attitude" towards mathematics with means of 4.11 and 3.78 respectively. Results are shown below.

Pupils' Mathematics Attitude as a Whole and when grouped as to Sex

Category	Mean	Description
Entire Group	3.93	Positive
Sex		
Male	4.11	Positive
Female	3.78	Positive

Scale	Description
4.20 – 5.00	Very Positive Attitude. This means that the respondents are highly interested and impressed in Mathematics.
3.40 – 4.19	Positive Attitude. This means that the respondents are interested in Mathematics.
2.60 – 3.39	Fairly Positive Attitude
1.80 – 2.50	Negative Attitude. This means that the respondents are not interested in Mathematics.
1.00 – 1.79	Very Negative Attitude. This means that the respondents are not interested and impressed in mathematics.

Spearman's rho test result shows that the teacher's approach is not significantly related to the pupils' mathematics attitude [rho_{value} =1.000 and .112; p= .690]. Hence, the result further implied that the teacher's approach has nothing to do with the mathematics attitude of the respondents. Results are shown below.

Relationship between Teachers' Approaches and Students' Mathematics Attitude

Variables	rho_{value}	Sig.	Interpretation
Teacher's Approaches	1.000	.690	Not Significant
Students Mathematics Attitude	.112		

CONCLUSION

Teaching has never become an easy task where one can talk, give tasks and walk out of the classroom. Teachers as a source of knowledge and experience are being considered and responsible for whatever the outcomes of the students will be. It is their performance and management of the classroom that matters most. But to add the characters of teachers, according to Addeyemo (2005), writing teacher characteristics influenced teaching and learning in classrooms.

The following were conclusions drawn based on the findings of the study:

1. The teacher utilizes other instructional materials aside from the chalk and the board, making them innovative and organized and has a positive outlook and believes in the pupils' capacity.
2. Both the male and female respondents were interested in learning mathematics, as shown by their positive attitude towards the subject.
3. The teachers' approaches do not influence or affect the pupils' attitude towards mathematics.

RECOMMENDATIONS

Based on the conclusions, some recommendations were given:

1. School Administrators must widen the opportunity of sending teachers to trainings. They should guide and encourage teachers to discover and learn the more effective and interactive ways of teaching mathematics.
2. Teachers should facilitate, encourage and guide their pupils to learn mathematics to enhance self-confidence and improve teamworking without letting them lose their interest in learning or studying. Teachers should also provide supplemental mathematics learning at home aside from classroom tasks so that pupils could practice and enhance their potentials and skills.
3. Pupils should participate actively in learning mathematics to improve or to practice their intellectual capacities. Also, they must develop the process of inquiry that will help them fully understand the mathematical concepts.
4. Parents must also encourage their children to study and participate in any math activities held at school. In addition, they should constantly monitor and check what has been done in school or their performance.
5. This study will shed more light on future researcher enthusiasts conducting similar research on teachers' approaches and pupils' mathematics attitudes. Further studies be conducted to identify more variables that may influence mathematics learning.

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To God be the glory!

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ACCEPTABILITY OF MILKFISH (*Chanos chanos*) MEATLOAF AS AN ALTERNATE TO EXISTING PRODUCTS IN THE MARKET

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ABSTRACT

The 2019 estimates on the average life expectancy at birth of an individual is 73.4 years. As to mortality, 8.9 million deaths are attributed to heart disease (IHC), the world's leading cause of death in 2019 (WHO, 2020). Pan American Health Organization (2020) emphasizes that nutrition is a critical part of health and development. Better nutrition is related to stronger immune systems, lower risk of non-communicable diseases, and longevity. Every individual has the right to safe and healthy diet that provides nutrients needed for an active and productive life. Therefore, to promote a healthy lifestyle, the researcher thought of developing a meatloaf product to substitute red meat to milkfish meat as a raw material. This study determined the level of acceptability of milkfish meatloaf in three different treatments as A, B and C in terms of color, aroma, texture, taste, and general acceptability. The experiment was conducted at the College of Hospitality Management Laboratory, Iloilo State College of Fisheries-Dumangas Campus, Dumangas, Iloilo, Philippines. The product was evaluated using the sensory evaluation score sheet by the trained evaluators. Results revealed that Treatment C with standard ingredients: 2 tablespoon lemon/calamansi juice, ¼ cup soy sauce, 1 onion, chopped, 2 large eggs, ½ bread crumbs, and 1 tsp. ground pepper added to a cup of pure milkfish meat was "Extremely Acceptable". Significant difference existed in the level of acceptability of the milkfish meatloaf in three treatments as to color, aroma, texture and taste. Milkfish meatloaf was liked very much by the evaluators and was considered one of the best alternative to existing meatloaf in the market today.

Keywords: Milkfish, Meatloaf, Substitute, Products, Market

INTRODUCTION

The 2019 estimates on the average life expectancy at birth of an individual is 73.4 years. As to mortality, 8.9 million deaths are attributed to ischaemic heart disease (IHC), the world's leading cause of death in 2019 (WHO, 2020). This figure may be partly attributed to the kind of food a person consumes every day. Pan American Health Organization (PAHO, 2020) emphasized that "an adequate diet is essential for people's health, well -being and development. We all have the right to a safe and varied diet that provides nutrients needed for a healthy, active life and that fits our cultural preferences".

UNICEF (2018), in its Global Nutrition Report revealed that malnutrition is unacceptably high and affects every country in the world. It provided a concrete overview of progress made and highlights solutions from around the globe calling on all stakeholders to act now to address malnutrition.

In response to this, the researcher in the academe took the initiative in addressing the issues in their own locality and one of the ways is to develop or make an innovation in the aspect of food production. Through food processing, the researcher may be able to contribute on how to ensure a safe, diverse, abundant, and accessible food supply. However, it is not enough to just produce food but the producers need to consider the dietary value of the product. What is seen in the market today is the emergence of varied canned products that are not friendly to health.

Many of them are processed meat filled with preservatives and are coated with synthetic colourings and these are marketable to the public as it is usually in the form of a "ready to eat" food. The danger is that excessive consumption of highly processed food might contribute to poor diet quality, obesity and health problems. Hartle, Navas-Acian and Lawrence (2016) concluded in their experiment that canned food, including some specific types such as canned vegetable and fruit, canned pasta, and canned soup were associated with higher levels of urinary BPA concentrations. Bisphenol A (BPA) is a synthetic chemical with endocrine disrupting properties approved for use in food packaging.

Canned foods are core components of the diets of many Filipinos. In the Philippines, canned foods are almost consumed in every home (especially in the cities). Filipino homes that have canned goods in stock will not have problems with preparing delicious meals for the next few days. Due to this lifestyle, many Filipinos suffered from hypertension and diabetes. Continued consumption of this high fat food could harm one's health like the sausages, corned beefs, ham and meatloaf. In some studies, there is a perception among consumers that processed meats in general are excessively high in fats considered to cause a variety of human diseases including high cholesterol levels; a risk factor for heart disease, obesity and certain cancers. Due to these health concerns, consumers are now demanding low-fat products but are at affordable prices. Therefore, alternative raw materials to substitute animal meat need to be explored to minimize animal fats in processed meats and in order to satisfy the health demands of consumers.

In order to address the needs of the consumers, the researcher thought of making an innovation to the existing meatloaf in the market today to make it healthier as well as safer for the consuming public. It also aimed to substitute red meat products by utilizing the milkfish (Chanos *chanos*) as raw material for it is abundant in the surrounding areas of Dumangas, Iloilo, Philippines. Milkfish are euryhaline, stenothermic fish. They occur and can be cultured in freshwater, brackishwater, and marine waters but only in the tropical and subtropical Indian and Pacific oceans. They are important food fish in Southeast Asia, specifically in the Philippines, Indonesia, and Taiwan (Food and Agriculture Organization, 2021). Promoting it for food innovation and production could also help other entrepreneurs generate income.

OBJECTIVES OF THE STUDY

This study aimed to determine the level of acceptability of milkfish meatloaf as an alternate to existing varieties of meatloaf in the market.

Specific objectives: (1) determine the level of acceptability of milkfish meatloaf in three different proportions as Treatment A, B and C in terms of color, aroma, texture, taste, and general acceptability; and, (2) determine if there are significant differences in the level of acceptability of milkfish meatloaf in three different proportions as Treatment A, B, and C in terms of color, aroma, texture and taste.

HYPOTHESIS OF THE STUDY

There are no significant differences in the level of acceptability of milkfish meatloaf in three different proportions as Treatment A, B, and C in terms of color, aroma, texture and taste when tested at .01 alpha level.

METHODOLOGY

What is the level of acceptability of bangus meatloaf using the same measures of ingredients mixed with: ½ cup bangus meat with ½ cup ground pork, ¾ cup bangus meat with ¼ cup ground pork, and 1 cup pure bangus meat

Research Design

Are there significant differences in the level of acceptability of bangus meatloaf in different proportions when evaluated as to specific characteristics: color, aroma, texture and taste?

Experimental research design was used in this study. According to Bevans (2020), experiment is a type of research method in which you manipulate one or more independent variables and measure their effect on one or more dependent variables.

In this study, the researcher experimented on the utilization of milkfish meat for a meatloaf with the same amount of ingredients added with the different proportions of milkfish meat and ground pork. The result of the study gave the researcher the idea as to which among the proportions generated a favorable and acceptable output as to aroma, color, texture, taste, and general acceptability.

Locale of the Study

This study was conducted at the College of Hospitality Management Food Laboratory, Iloilo State College of Fisheries-Dumangas Campus, Dumangas, Iloilo, Philippines. The College offers a Bachelor of Science in Hotel and Restaurant Management program.

Respondents of the Study

There were 50 evaluators who tested and evaluated the samples of meatloaf in three different proportions as Treatment A, B, and C. They were the Hotel and Restaurant Management (HRM) Faculty Members, Technology and Livelihood Education (TLE) teachers, restaurant owners, restaurant cook, and homemakers.

Of the 50 (100%) evaluators, each group was represented by 10 food experts considered as 20% of the total sample. They helped the researcher determine which proportion of the milkfish meatloaf is most acceptable for consumption in the terms of color, aroma, texture, taste and general acceptability and would be an alternate to the existing meatloaf products in the market.

Table 1. Distribution of Evaluators

Evaluators	*f*	%
Faculty of Hotel & Restaurant Management	10	20%
Technology & Livelihood Education Teachers	10	20%
Restaurant Owners	10	20%
Restaurant Cook	10	20%
Home makers	10	20%
Total =	**50**	**100**

Sampling Technique

Purposive sampling technique was used for the selection of the evaluators. The researchers identified only 50 evaluators who were trained or have expertise in food preparation or cooking. Ten evaluators per category were represented. They were the Technology & Livelihood Education teachers and external evaluators like the restaurant owners, restaurant cook and homemakers. According to Business Research Methodology (2020), purposive sampling is also known as "judgment, selective or selective sampling". By using the purposive sampling technique, the researcher relies on his or her own judgment when choosing members of the population to participate in the study.

Ethical Consideration

Prior to the final selection of the evaluator, their permission to be part of the study was sought as product evaluator. They were briefed about the study to enable them to make an informed decision. Those who agreed to participate had to sign consent forms. Members were free to withdraw from the study at any time.

Research Instrument

This study used the modified sensory evaluation score sheet anchored on the Five-Point Hedonic Scale to evaluate the finished products which is the milkfish meatloaf prepared in three different proportions as Treatment A, B, and C in terms of color, aroma, texture, taste and general acceptability. The following scores and descriptions were used when evaluating each product in three (3) proportions: Five (5) for Liked Very Much; Four (4) for Liked Much; Three (3) for Liked Moderately; Two (2) for Disliked; and One (1) Disliked Very Much as the responses of the evaluators. The general acceptability of the product by proportion was described as: 4.21-5.00, extremely acceptable; 3.41-4.20, very much acceptable; 2.61-3.40, Acceptable; 1.81-2.60, moderately acceptable; and, 1.00-1.80, not acceptable.

Experimental Procedures

Phase I: Preparation of Materials

Phases II. Preparation of Ingredients for the Milkfish (Chanos chanos) Meatloaf

Mixture: Ingredients with standard measure:

- 2 tablespoon lemon/calamansi juice
- ¼ cup soy sauce
- 1 onion, chopped
- 2 large eggs
- ½ bread crumbs
- 1 tsp. ground pepper

Add: Milkfish/Pork Meat by proportion

Treatment A

(1/2 cup milkfish meat, ½ ground pork)

Treatment B

(3/4 milkfish meat, ¼ cup ground pork)

Treatment C

(1 cup pure milkfish meat)

Procedure:

Clean, fillet, blanch the milkfish in pan for 10 minutes and set aside to cool. Debone the milkfish, extract the meat and shred it evenly for the mixture. Mix all the ingredients in a mixing bowl, add the milkfish meat according to proportion with or without ground pork and mix until evenly suspended. Place the meatloaf mixture in a

baking tin or wrap it in an aluminum foil, then put it in a steamer with boiling water for about 30-45 minutes depending on the thickness of the mixture. Let it cool in a refrigerator. Slice into desired sizes.

Data Gathering Procedure

Phase III: Evaluation of the Finished Product

This study was conducted at the College of Hospitality Management Food Laboratory, Iloilo State College of Fisheries-Dumangas Campus, Dumangas, Iloilo, Philippines.

1. What is the level of acceptability of bangus meatloaf using the same measures of ingredients mixed with: ½ cup bangus meat with ½ cup ground pork, ¾ cup bangus meat with ¼ cup ground pork, and 1 cup pure bangus meat.

The selected evaluators were asked to taste the samples of the milkfish meatloaf in three different proportions using their judgment of the finished products using the modified sensory evaluation score sheet and the modified five point Hedonic Scale in terms of its color, texture, flavor and aroma and general acceptability.

The data were tallied, coded and entered into the Microsoft Excel for data processing using the Statistical Package for Social Sciences software (SPSS).

Statistical Tools

The data gathered in this study were analyzed using the following statistical tools: Frequency count, percentage, and mean for descriptive analysis. Kruskal-Wallis H Test was used to determine the significant differences in the evaluation of mikfish meatloaf in three different proportions as Treatment A, B. and C in terms of color, aroma, taste, and texture.

FINDINGS

Descriptive Analysis

The results revealed the level of acceptability of milkfish meatloaf (Chanos chanos) in three different treatments in terms of aroma, color, texture, taste, and general acceptability.

Treatment A which used the ½ cup of milkfish and ½ cup ground pork added to the mixture was evaluated by the evaluators as *very acceptable* in terms of color (M=4.16), flavor (M=4.12), texture (M=4.10), aroma (M=4.10), and general acceptability (M= 4.12) which meant that it is liked much by the evaluators.

Treatment B which used 3/4 cup of milkfish meat and ¼ ground pork was evaluated by the respondents as *very acceptable* in terms of color (M=4.18), flavor (M=4.06), texture (M=4.20), aroma (M=4.16) and general acceptability (M-4.16) which meant that it is liked much by the evaluators.

Treatment C which used 1 cup pure milkfish meat added to the mixture was evaluated by the respondents as *extremely acceptable* in terms of color (M=4.62), flavor (M=4.70), texture (M=4.60), aroma (M=4.66), and general acceptability (M- 4.65) which meant that it is liked very much by the evaluators.

Comparing the three treatments, although all treatments were very acceptable to the standards of the evaluators, it is treatment C that generated an *extreme level of acceptability* for the evaluators which was interpreted as liked very much. This implies that a cup pure milkfish meat mixed with other ingredients was the most suitable measurement to make a delicious, nutritious, enticing, most marketable and an alternate meatloaf for consumption.

Table 2. Level of Acceptability of Milkfish Meatloaf in Different Treatments

Category	Treatment A		Treatment B		Treatment C	
	Mean	Desc	Mean	Desc	Mean	Desc
Color	4.16	VA	4.18	VA	4.62	EA
Flavor	4.12	VA	4.06	VA	4.70	EA
Texture	4.10	VA	4.20	VA	4.60	EA
Aroma	4.10	VA	4.20	VA	4.66	EA
General Acceptability	**4.12**	**VA**	**4.16**	**VA**	**4.65**	**EA**

Scale	Description	Interpretation
4.21-5.00	Extremely Acceptable (EA)	Liked Very Much
3.41-4.20	Very Acceptable (VA)	Liked Much
2.61-3.40	Acceptable (A)	Liked Moderately
1.81-2.60	Fairly Acceptable (FA)	Liked Less
1.00-1.80	Not Acceptable (NA)	Disliked

Inferential Analysis

Kruskal-Wallis H test shows significant differences in the levels of acceptability of milkfish meatloaf in terms of color (x2=11.637, p=.003); flavor (x2=23.615, p=.000); texture (x2=14.453, p=.001), and aroma (x2=15.574, p=.003). The computed probabilities were less than the set alpha level of .01 respectively.

The results imply that the evaluation of the evaluators of the milkfish meatloaf differ with one another as to treatment or proportion.

Table 3. Differences in the Acceptability of Milkfish Meatloaf in Different Treatments in terms of Color, Aroma, Texture and Taste

Sources of Variation	df	Mean Rank	x^2	Sig	Int.
Color					
Treatment A	2	69.02	11.637	.003	Sig.
Treatment B		66.46			
Treatment C		91.02			
Aroma					
Treatment A	2	64.75	15.574	.000	Sig.
Treatment B		69.08			
Treatment C		93.29			
Texture					
Treatment A	2	64.75	14.453	.001	Sig.
Treatment B		68.96			
Treatment C		92.79			
Taste					
Treatment A	2	66.06	23.615	.000	Sig.
Treatment B		62.70			
Treatment C		97.74			

CONCLUSIONS

Based on the findings, the researchers arrived at the following conclusions:

1. Of the three treatments of the milkfish meatloaf, the result tells that the evaluators were extremely satisfied with the quality of the output of Treatment C (2 tablespoon lemon/ calamansi juice, ¼ cup soy sauce, 1 onion, chopped, 2 large eggs, ½ bread crumbs, and 1 tsp. ground pepper added to a cup of pure milkfish meat) in terms of color, aroma, texture, taste and general acceptability.
2. The evaluators prefer most the utilization of pure milkfish meat for a meatloaf as a new food innovation as it is a delicious and healthy meal for the consuming public.
3. Milkfish meat as a prime raw material proved to be one of the best substitutes for meatloaf production in the market today.
4. Milkfish meatloaf production shows to be a potential source of additional income for the homemakers, entrepreneurs, and others.

RECOMMENDATIONS

The experimental study results gave the researcher the ideas that led her to formulate the following recommendations:

1. The study result shall be disseminated to the public informing them that milkfish can be a potential raw material for meatloaf making and as a good substitute for pork meat.
2. Adopting this new product innovation technology is a positive scheme for income generation.
3. Local Government Officials and agricultural entrepreneurs may encourage fishpond owners and milkfish growers to invest more on milkfish breeding as a sustainable source of raw material and for an increased food production, economic stability and product sustainability.
4. Medical practitioners may contribute in promoting a healthy lifestyle by encouraging people to consume this new product as a good alternative for the existing canned and meat products in the market.
5. The school canteen should promote the selling of the nutritious milkfish meatloaf especially for students' consumption for a better health.
6. Another research study may be conducted to determine the nutritional value, shelf life and best packaging techniques for the product.

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GROWTH AND SURVIVAL OF SILVER POMPANO *Trachinotus blochii* IN NET CAGES FED WITH DIFFERENT DIETS

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ABSTRACT

This study was conducted to determine the growth and survival rate of *Trachinotus blochii* in net cages fed with four different diets, namely: T1-Golden apple snail; T2-Acetes Sp.; T3-Trash fish, and Commercial Feeds as Control, replicated three times over the culture period of 60 days. Each cage was stocked with 10 juvenile silver pompano and set up in a randomized complete block design. After 60 days of culture, results showed that the best growth performance determined in terms of weight (ABW) and length (TBL) can be seen in silver pompanos fed with Acetes sp. However, it was also in this treatment that the fish showed the lowest survival rate of 83.33%, compared to those fed with golden apple snails, who had the highest survival rate of 93.33%. It was also disclosed that the significant difference in average length is found between fishes fed with commercial feeds vs. those fed with Acetes sp. and Golden Apple snail vs. Acetes sp. Moreover, there was a significant difference in the average weight and average length of silver pompano fed with four different feed types. The growth indicators (except growth rate in average length) of Silver Pompano fed with Acetes sp. and trash fish were significantly different from those of Silver Pompano fed with the other two feed types. There was no significant difference between silver pompano fed with Acetes sp. and those fed with trash fish in terms of average length. The use of Acetes sp. and trash fish is recommended to feed Silver Pompano due to its high growth rate. Though there are issues with the survival rate, these can be treated since the significant factors are due to its food and environmental conditions.

Keywords: Silver pompano, growth, length, survival, feed conversion ratio, water parameters, diet, cages

INTRODUCTION

The Indonesian marine aquaculture sector has a new potential species, the Silver Pompano (Trachinotus blochii, Lacepede). Silver pompano is a pelagic and active species that is easily domesticated and cultured in tropical marine waters. An euryhaline, omnivorous fish with good meat quality is comparatively easy to breed under controlled conditions. It is ideal for mariculture because of its fast growth rate and easy weaning to pellet feeds. Silver pompano larvae, fingerlings, and adults can be easily acclimatized to lower salinities (Gopakumar et al. 2011).

The Carangidae family (trevally and jacks) includes the Silver pompano, which inhabits in coral reef environments less than 7 meters deep (Paton, et.al., 1989). The resilient Silver pompano dwells in the open waters, according to Borut Forlan (2004), and can be found in the Atlantic, Indian, and Pacific oceans. They tend to form groups as they are in fingerlings stage but as adults, they become alone. This fish's natural food consists primarily of sand mollusks and other invertebrates.

Silver pompano was introduced from Taiwan and China because it is the most popular species cultured in Taiwan, but it is also found in Indonesian waters. It takes 3 years for the fish to mature as brood stock (Anonymous, 2007). As the fish grows fast and fetches a good market price, it has good potential for aquaculture in the Asia-Pacific. At present, the Mariculture Development Centre of Batham has been successful in breeding and

producing the seed of silver pompano so that the fingerlings can be produced locally, thus reducing reliance on imported fingerlings from overseas sources.

The pressures of rising food demand to feed the world's growing population have prompted a search for species with high cultural potential.Snub-nose pompano is a good candidate because it can easily adapt to captive conditions in ponds and cages, can readily accept formulated feed (pellet), and can be grown at lower salinity (15-18 ppt). Furthermore, it possesses white flesh, a quality that is preferred by consumers both locally and overseas. The development of the pompano industry in the Philippines is currently impeded by the low supply of fingerlings for stocking in ponds and cages. Only a few hatcheries are producing pompano, and this is highly insufficient to meet the growing demand for pompano fingerlings by fish farmers. Growing silver pompano in floating sea cages has several advantages compared to mud culture, such as lower disease risks, shorter crops, and better benefits. Hence, this fish species is a favorite product in many markets. Thus, the culture of silver pompano in floating cages is of great interest. However, because this fish is still a relatively new aquaculture target like in Vietnam, the economic benefits from its culture are still low and unstable because the survival and productivity rates are still low. Among the high-value marine tropical finfish that could be farmed, the Snubnose or Silver Pompano is one of the most popular because of its fast growth rate, good meat quality, and high market demand (Jayakumar, R.et.al.)

STATEMENT OF THE PROBLEM/ OBJECTIVES

The main trust of this study was to determine the growth and survival of the Silver pompano (Trachinutos blochii) fed with different diets, i.e. Commercial feeds as control (1) Golden Apple Snail, (2) Acetes sp., (3) trash fish.

Specifically, the study aimed to determine the:

1. Growth rate of silver pompano cultured in net cages in pond fed with different diets.
2. Survival rate (SR)
3. Feed Conversion Ratio (FCR)
4. Physico-chemical parameters specifically temperature and salinity

METHODOLOGY

The study was conducted in fishpond of the Bohol Island State University (BISU), Candijay Campus, in Cogtong, Candijay, Bohol, from June 26 to August 25, 2018. (Fig.4). Complete Block Design (CRD) with four treatments was used in the study, which was replicated three times.

Construction of Net Cages

For this study, bamboo flotation composed of 12 compartments was constructed in a fishpond with the following dimensions: 1.0 m x 1.0 m x 1.5 m. Empty screw-capped plastic bottles filled with sand were used as floaters and sinkers. Nets were fabricated like inverted mosquito nets with coverings at the top portion. Each net cage, made of polyethylene material no. 17 (mesh size 1mm), was supported by polyethylene rope (no. 8), inserted along the sewed portion of the net, joined together, and tied to the bamboo frame.

Collection and Processing of Diets

The golden apple snail (GAS) was collected from Tuhob, Can-olin, Candijay, Bohol (Figure 2). The materials were washed, cooked, removed from their shells, dried, ground, and sieved through a fine mesh net. The same was also done with the acetes sp., after being purchased on the market. For commercial feed, which is used as control feed, the one that is used for milkfish was being used. After that, all materials were weighted individually.

Experimental Design and Treatments

The experimental set-up was arranged through a completely randomized design (CRD). Each treatment was stocked with 10 juvenile silver pompanos. Four treatments were used, i.e., the Golden Apple Snail, Acetes sp., trash fish, and commercial feeds as controls. Simultaneously, each treatment was replicated three times. The cultural period was limited only to 60 days.

Silver Pompanos (Trachinotus blochii lacepede, 1901) weighing more or less 1.0 to 1.2 g were purchased from the BFAR Finfish hatchery at Bentig, Calape, Bohol, then placed in oxygenated double-layered plastic bags, transported by bus, and brought to the study site. Each bag contained 40 pieces of silver pompano juveniles. After a 2-hour transport, the survival rates were 100% (120 pcs.).

Stocking

Upon arrival in the experimental site, the fry were placed on the water for acclimatization. The fish were conditioned 10 minutes before their distribution to designated cages at a stocking density of 10 pieces / cage. Before stocking, each fry weighted at 1.0 to 1.2 g (ABW) and measured at 2.5 cm (TBL).

Feeding

After collection and processing of the diets, the feeds were given to the stocks. The feeds were given four times a day at 6:00 AM, 10:00 AM, 1:00 PM, and 4:00 PM. Throughout the 60-day culture period, a ten percent feeding rate of the fish ABW was used.Feedings were done through broadcasting.

Care and Maintenance of Experimental Units

Inspection of the net cages was done every week to secure the safety of the stock and to avoid unwanted species from entering the net cages. The submerged nets were checked regularly to remove debris thus allowing free movement of the water (Rasgo, 2012). Cleaning of the nets was minimized because of the omnivorous nature of the Trachinotus blochii.

Sampling

Sampling was done every week to determine the average body weight (ABW), total body length (TBL), the biomass, and daily feed requirements. Initially, the number of fish sampled was 50% of the total population, or 5 pcs/cage. A scoop net was used to catch the fish, which was then placed in a basin for weighing and length measurement. After obtaining the ABW and TBL, the stocks were then returned immediately to their respective cages to avoid stress and mortality (Rasgo, 2012).

Monitoring of Physico- Chemical Parameters

Physico-chemical parameters were recorded weekly at 6:00 am. An Atago refractometer was used to determine salinity, and a water thermometer was used to monitor temperature.

Harvesting

The fish were weighted and harvested after 60 days of culture, then sold to fish farmers at Php 10.00 each.

Figure 1. Collection and Processing of GAS

Figure 2. Collection of Processing of Acetes sp.

Figure 3. Experimental set-up showing the treatments and replications

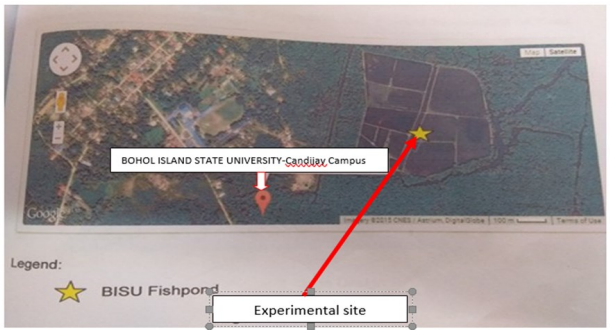

Figure 4. Map of BISU Fishpond showing the location of experimental site

Statistical Tools and Analysis

Data Analysis

The data collected were average body weight (ABW), total body length (TBL) and survival rate (SR). The production and percentage increases in ABW and TBL were computed from the said data using the following formulae:

1. Specific Growth Rate = $\frac{\text{final wt. - initial wt.}}{\text{Days of culture}}$

2. Survival Rate = $\frac{\text{Total number harvested / cage x 100}}{\text{Initial number of stock}}$

3. FCR = $\frac{\text{Amount of feed used}}{\text{Total weight gained}}$

Daily Feed Ratio = Total Stock x Body Weight x Feed Rate x Survival

Computation of Two-Way Analysis of Variance (ANOVA) in terms of culturing silver pompano with four different types of feeds.

Statistical Analysis

The data on ABW, TBL, and SR were calculated and, analyzed using Analysis of Variance (ANOVA) to detect the statistical differences among treatments, the procedures of Gomez and Gomez (1984). When there were significant differences detected at 1% level, the data were analyzed further for Least Significance Different Test to determine the prescribed level of significance between any pair of treatment means (Gomez and Gomez, 1984).

FINDINGS

For the 60-day culture period, T2 had the highest average body weight (ABW) of all the sampling periods, while T3 had the highest ABW in the 6th sampling when compared to commercial feeds as control T1, and T2. The final ABW of control animals is 9.1 g (Table 1a).

TABLE 1: GROWTH AND SURVIVAL OF SILVER POMPANO (*Trachinotus blochii*) FED WITH DIFFERENT DIETS

	Treatments			
	Commercial Feeds as control	**I – Golden Apple Snail**	**II- Acetes Sp.**	**III-Trash Fish**
SAMPLING				
Initial	1.2g	1.2g	1.2g	1.2g
1st	2.87g	2.4g	3.17g	3.1g
2nd	3.2g	3.07g	4.87g	4.5g
3rd	4.27g	4.17g	6.2g	6.0g
4th	5.1g	5.4g	7.8g	7.37g
5th	5.8g	6.0g	8.7g	8.9g
6th	6.5g	6.6g	9.5g	9.77g
7th	7.6g	7.7g	10.5g	10.53g
Final	**9.1g**	**9.0g**	**11.7g**	**11.47g**

Table 1 displays the corresponding growth rates in terms of weight (g) in the culture of Silver pompanos fed with four different feed types during the 60-day study period—commercial feeds as the control, Golden Apple Snail (T1), *Acetes* Sp. (T2), and Trash fish (T3).

The mean growth rate in in these treatments are as follows: Commercial feeds as control (9.1 g); T1 (9.0 g); T2 (11.7 g); and T3 (11.47 g). The Acetes sp. shows to be the ideal feed for culturing

Silver pompanos (*T. blochii*) garnering the highest growth rate, while the Golden Apple Snail show to be the least ideal feed for this study.

According to the data in this table, silver pompanos fed *Acetes* sp. have the highest growth rate in terms of average weight from the first to fourth periods. However, during the fifth period, they started to tie with the fish fed with trash fish until the last period (8th). The same phenomenon was observed to also occur with the fish fed with commercial feeds and those fed with Golden Apple Snail, which had approximately equal growth rate, in terms of average weight, from the third up to the last period. Overall, the silver pompano has a decreasing trend in average growth rate (weight) as they approach maturity. According to Chavez (2011), the production of silver pompanos in marine-based cages is technically and economically feasible because of the natural food that can be found in marine waters and so with brackish water ponds. It is critical that feed is both economically and environmentally sustainable. Among feed ingredients, fish meal is the major contributor to feed costs. With the higher feed demand in aquaculture, poultry, and livestock, the supply of fish meal is expected to decline due to a shortage of world production (El-Sayed, 2004). Replacing fish meal in practical diets without reducing performance would result in more profitable production.

Growth as indicated by total body length (TBL)

TABLE 2: TOTAL BODY LENGHT OF SILVER POMPANO (*Trachinotus blochii*) WITH FOUR (4) DIFFERENT DIET

	Treatments			
	Commercial Feeds (as control)	**I – Golden Apple Snail**	**II- Acetes Sp.**	**III-Trash Fish**
SAMPLING				
Initial Sampling	2.5 cm	2.5 cm	2.5 cm	2.5 cm
1st	2.8 cm	2.8 cm	2.7 cm	2.8 cm
2nd	2.9 cm	3.0 cm	3.0 cm	2.9 cm
3rd	3.0 cm	3.2 cm	3.2 cm	3.2 cm
4th	3.2 cm	3.4 cm	3.5 cm	3.4 cm
5th	4.5 cm	4.9 cm	5.4 cm	5.2 cm
6th	5.5 cm	5.4 cm	6.0 cm	5.8 cm
7th	6.1 cm	6.1 cm	6.6 cm	6.4 cm
Final	**6.7 cm**	**6.5 cm**	**7.0 cm**	**6.8 cm**

In terms of total body length (TBL), the Acetes sp. (T2), once again, showed the best results at 7.0 cm. Apart from the first sampling period, where the fish under T2 were short in length by 0.1 cm compared to the other treatments, T2 nevertheless continued to show, and consistently so, improvements in the fish from that onwards up to the last sampling period.

Meanwhile, at the end of the study period, the Golden Apple Snails (T1) showed the least ideal results, at 6.5 cm. only.

As to comparing the average length growth rates of the fish subjects across the four groups, those which are fed with *Acetes* Sp. have the highest growth rate, starting from the third until the end of the experimental period. However, at the first sampling period, the fish fed with Golden Apple Snails have the highest growth rate, while those fed with commercial feeds have the lowest growth rate, in general. According to Groat (2002), growth rates of Silver pompanos (*T.blochii*) are highly dependent on the kinds of feeds used.

As per the data in table 2, it can be deduced that there is a significant difference in terms of growth rate of average weight among Silver Pompano fed with four (4) different feed types and across the eight (8) sampling periods at 2.34x10-6 or P<.01 significance level. There is no significant difference in average length among fish fed with four types of feed. However, there is also no significant difference in the average growth rate of the fish subjects across the four (4) feed types and eight (8) sampling periods.

Growth in fish is highly variable depending on food availability and environmental conditions (Han et al., 2014). The decreasing growth rate of the fish subjects fed with Golden Apple Snails, commercial feeds, and trash fish could be attributed to that fact. The fish is unable to select food that can make itself yield an energy return sufficient to support an increase in its size. The temporary acceleration of the subjects' growth rates in the fifth sampling period could be a manifestation of the "catch-up phenomenon" which may happen following a prolonged period of partial or complete starvation (Durta, 1994).

Survival Rates

Survival is one of the most important indicators to be considered in this type of experiment. Many studies have been conducted on the survival rate of *T. blochii* under different conditions. A survival rate is the percentage based on the number of fish still living after a certain period of time, usually influenced by food and environmental conditions (Syahailatua et al., 2017).Fish with a high survival rate are usually required to achieve a viable growth in aquaculture (Efferdie,

1979).In this study, fish fed with Golden Apple Snails (GAS) had the highest survival rate (93.3%), while those fed with *Acetes* sp. had the lowest (83.33%) at the end of the experimental period. The feasibility of the Golden Apple Snail (GAS) as an alternative protein source has been tested for shrimp (Kalinawski et al., 2007) and prawns (Chien et al., 2016). Just recently, Visca et al. (2018) used GAS as a feed for Siganus guttatus. Their study shows a 95%-99% survival rate. Golden apple snails have been known to have an Astaxanthin component which not only enhances fish color (Boonyapakdee et al., 2014) but also their anti-oxidant defense system (Xang et al., 2016). The high survival rate of fishes fed with GAS could be attributed to this component since the anti-oxidant defense system, when changed, especially the enzymatic scavengers SOP, CAC, and glutathione peroxidase, can provide protection against potentially harmful ROS produced constantly during aerobic cell respiration (Lygrenet et al., 1999). The survival rate in T1 can be attributed to the proper acclimatization, conditioning of stocks, feeding management, environmental conditions, and water quality.

TABLE 3. SURVIVAL RATES OF *T. blochii* USING FOUR (4) DIFFERENT DIETS

TREATMENT	Replicates	No. of Fish Cultured	No. of Fish Survived	Survival Rate (%)	Mean
Commercial Feeds as control	1	10	7	70	86.67
	2	10	9	90	
	3	10	10	100	
I – GAS	1	10	10	100	93.33
	2	10	8	80	
	3	10	10	100	
II- Acetes Sp.	1	10	10	100	83.33
	2	10	7	70	
	3	10	8	80	
III - Trash Fish	1	10	10	100	90
	2	10	8	80	
	3	10	9	90	

From the data in Table 3, it can be deduced that the *Acetes* sp., given its poor survival rate and its relatively high cost (Php 50.00/kg.), is therefore not the ideal feed for silver pompano culture. The same goes with commercial feeds, which are third in rank with a mean survival rate of merely 86.67 percent and a cost of PHP 45.00/kg. In a business context, it would make sense if silver pompano culture would give a high yield (i.e., a high survival rate) at a relatively low production cost.

At the end of the experimental period, fishes fed with Golden Apple Snail (T4) have the highest survival rate (93.33%) compared to those fed with Acetes sp. (T2) have the lowest survival rate (83.33%).

FEED CONVERSION RATIO (FCR)

TABLE 4: FEED CONVERSION RATIO

Treatment	TFC	Biomass	FCR
I – GAS	860.16	252.0	3.4
II- *Acetes* Sp.	1,146.74	292.5	3.9
III- Commercial Feeds	858.34	236.6	3.6
IV – Trash Fish	1,235.30	309.7	4.0

Feed Conversion Ratio (FCR) is a valuable tool for the fish farmer as it allows for a reliable estimate of the amount of feed that will be required in the growing cycle. Knowing how much feed will be needed then allows fish farmers to determine the profitability of an aquaculture enterprise; it also allows them to make wise choices in selecting and using feed to maximize profitability. Fishes' average FCR was found to be between 1.0 and 1.8 (www.aquafeed-techna.com., n.d.). The lower the FCR, the higher the weight gain obtained from the feed. The trash fish has the highest value (4.0), while the golden apple snail has the lowest (3.4). A higher FCR suggests that the fish are using relatively low levels of the dietary nutrients for somatic growth (Hasan, 2012). Many factors, including fish health, genetics, environment, fish size and body composition, feeds, and feeding, have the potential to influence FCR (Robinson and Li, 2015).However, Fry et al. (2018) state that in order to better understand the flow and loss of nutrients in the global food system, especially for aquaculture feed, and the implications for resource use and global feed security, multiple measurements (i.e., protein and calorie retention) should be made aside from FCR.

PHYSICO-CHEMICAL PARAMETER

TABLE 5: PHYSICO CHEMICAL PARAMETERS

PARAMETERS	Initial	SAMPLING PERIOD								Mean
		1st	2nd	3rd	4th	5th	6th	7th	8th	
SALINITY (in ppt)	30	28	29	28	30	27	30	29	30	29
TEMPERATURE (in ºC)	28	27	28	27	28	26.5	29	27.5	28	27.67

Table 5 shows the results of the weekly monitoring of water parameters. The salinity ranged from 27 to 30 ppt. The highest salinity was noted on the 4th, 6th, and 8th sampling periods, while the lowest was noted during the 5th. The water temperature ranged between 27 and 29 degrees Celsius. Among the two water parameters, salinity was observed to be most affected during rainy seasons.

The mean salinity result for this study is 29 ppt. Silver pompanos can tolerate a wide range of salinities from 10 to 40 ppt (Jakuyamar (2014). However, ideal salinity for farming would be between 15 to 25 ppt., and the pond has to be filled with a minimum water level of 100 cm prior to stocking of fish seeds. During the entire cultural period, a minimum of 1.5 meters of water depth has to be maintained.

DISCUSSION

This study was conducted to determine the growth and survival of Silver Pompano (Trachinutos blochii) in pond cages fed with four different feeds, namely: the Golden Apple Snail, Acetes sp., commercial feed, and trash fish used as control. Average body weight (ABW), total body weight (TBL), survival rates (SR), feed conversion ratio (FCR), and the degree of significance difference in growth rates among Silver pompanos fed four different types of feed were the parameters used.The experiment was replicated three times.

The T. Blochii fed with acetes sp. had the highest ABW (11.7 g); the lowest was in the golden apple snail with 9.0 g. In terms of total body length (TBL), the Acetes sp. (T2), once again, showed the best results at 7.0 cm. Apart from the first sampling period, where the fish under T2 were short in length by 0.1 cm compared to the other treatments, T2 nevertheless continued to show, and consistently so, improvements in the fish from that onwards up to the last sampling period. Moreover, at the end of the study period, the Golden Apple Snails (T1) showed the least ideal results, at 6.5 cm. only.

Meanwhile, at the end of the experimental period, fish subjects fed with trash fish have the highest survival rate (93.33%), while those fed with Acetes sp. have the lowest survival rate (83.33%). Though there are issues with the survival rate, these can be treated since the significant factors are due to its food, environmental, and other conditions.

Using two-way Analysis of Variance (ANOVA) with repeated measures with four (4) different feed types, at a 0.01 level of significance with three degrees of freedom, the results show that there were significant differences ($P<0.05$) on the 4th sampling until harvest. Results of the Least Significance Difference Test (LSD) show that there is a significant difference in the growth rates of the average weights of Silver pompanos between feed pair comparisons of commercial feeds vs. Acetes sp., Golden Apple snail vs. Acetes sp., trash fish vs. commercial feeds, and trash fish vs. Golden Apple snail. The largest mean difference is found between feed pair comparisons: Commercial Feeds vs. Acetes sp., and Golden Apple snail vs. Acetes sp.Fish fed with Acetes sp. have a higher mean growth rate of 1.7092 than those fed with Golden Apple snail, and there is a significant difference in the average length found among Silver pompanos between feed pair comparisons: Commercial Feeds vs. Acetes sp. fed with Acetes sp. have a significantly higher average length (by 0.304) than those fed with commercial feeds and are higher by 0.232 than those fed with Golden Apple snails at a 5% level of significance.

CONCLUSIONS

Based on the findings of the study, the following conclusions were drawn; Fish fed with acetes sp. were found to grow faster and had the lowest survival rates than those fed with trash fish. However, the golden apple snail diets were more economically-viable than the commercial feed used. It was observed that, GAS meal has the least growth rate but the highest in survival rates. Commercial feeds are less likely advantageous for growing Silver pompano compared to Acetes sp., and trash fish feeds.

RECOMMENDATIONS

Based on the outcomes of the study, the following recommendations were offered:

Another study should be conducted which combines two types of practical meal (GAS and Trash fish) with vitamins and minerals premix and feed attractant to enhance better growth and survival; and the study of the feeding rate and frequency of the different weight ranges using cost-effective practical feeds with increasing CP content from fry to marketable size in sea cages.

Dissolved oxygen (DO) and pH must be monitored daily to determine the effect on the condition of silver pompano. The use of Acetes sp. and trash fish is recommended to feed Silver Pompano due to its high growth rate. There are issues with the survival rate, but these can be treated since the significant factors are due to its food, environmental, and other conditions.

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PEDAGOGICAL APPROACHES IN TEACHING MATHEMATICS AMONG PUBLIC HIGH SCHOOLS IN ISABELA

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ABSTRACT

This descriptive study aimed to determine the pedagogical approaches in Mathematics used by mathematics teachers among public high schools in Isabela. The respondents were taken from big schools in every municipality in the province of Isabela including cities of Ilagan, Cauayan and Santiago. Teacher - respondents were chosen using purposive sampling with 99% level of confidence and 5% margin of error. Out of the 123 senior high school teachers handling Mathematics in the selected big schools in the province of Isabela, a total of 104 teachers were proportionally distributed in each district. A self-made questionnaire which consists of two parts was developed: part I comprised the profile of the teacher-respondents while part II focused on the pedagogical approaches utilized by the mathematics teachers such as the constructivist, collaborative, inquiry-based, integrative and reflective. Results showed that Female teachers were dominant in this study. It is quite known that women dominate the teaching profession. Although in this study, the number of male mathematics teacher as respondent was quite high. The most prevalent pedagogy as perceived by the teachers were the constructivist approach, followed by reflective, inquiry – based, collaborative and integrative approach, respectively. The status of educational attainment, experience, and training were not prevalent in the participants, which is alarming given that they are teachers who should be updated in content and pedagogy. For the extent of use of pedagogical approaches, the most prevalent approach used by teacher is constructivist approach based on their perspective. The difference on the extent of use of the pedagogical approaches across the profile variables was generally not significant. Therefore, the teacher-respondents use these approaches in the same extent regardless of sex, major, level of education, and teaching experience. To further improve and strengthen the pedagogical approaches of the Mathematics teachers, the school administrators, as lead implementers, may develop or include in their implementation plan teachers on pedagogical approaches through supervisory program and in –service trainings or Learning Action Cell (LAC) sessions. Also, they could widen their linkages and connections to involve more stakeholders so that instructional requirements can be met .

Keywords: pedagogical approaches, collaborative, constructivist, inquiry-based, integrative, reflective

INTRODUCTION

Mathematics is one of the dominant subjects being taught both in the elementary, high school and even in the tertiary level. It plays an important role in any educational enterprise. With the advent of modern Science and Technology in the country and the entire world as well, it is evident that changes in the teaching of the subject can never be underestimated. Today, the teaching of Mathematics focuses not only on memorization of facts, but foremost on understanding the concepts, processes and how and why such have come to its results. The understanding of the principles in Mathematics is being emphasized in the teaching – learning process.

Mathematics in the senior high schools is taught with an increase in time allotment enabling

the teachers to finish teaching all the objectives stipulated in the Mathematics K12 Learning Competencies. Students learn and understand better the concepts of Mathematics rules because they are exposed and engaged in hands – on activities, cooperative learning, observations, learning by doing, comparison and contrast, discover in their own, generalize and apply the insights gained in the daily complex situations.

In 2012, the Department of Education of the Philippines embraces the K-12 curriculum, which means that the Philippine Basic Education observes the Kindergarten plus 12 years to complete its Basic Education Program to provide sufficient time for mastery of concepts and skills, develop lifelong learners, and prepare graduates for tertiary education, middle level skills development, employment, and entrepreneurship (DepEd, 2012). This move is taken because of the poor quality of the Philippine Basic Education as reflected by the low achievement scores of Filipino students in the National Achievement Test (NAT) and the international test known as the Third International Mathematics and Science Study (TIMSS) (Tatsuoka, Corter, & Tatsuoka, 2004; DepEd. 2012).

As indicated in the Mathematics Framework for Philippine Basic Education, the twin goals of Mathematics in the basic education levels, K to 10 are Critical Thinking and Problem Solving. For Filipino students, critical and analytical thinking cover the following skills such as: conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by observation, experience, reflection, reasoning, or communication, as a guide to belief and action. On the other hand, Filipino Problem Solvers encompass skills that can give reasoning and solutions to problems and making mathematical connections to real life. The vision is to achieve the focus goal through the teaching of a solid mathematical content, the development of strong cognitive skills and the promotion of desirable cognitive values to all Filipino students no matter their background. (https://www.slideshare.net/benzxui/k-to-12-math-curriculum)

According to Krohn (2015), as cited by Valdez (2019), some students tend to enjoy or appreciate Math, others find mathematics intimidating, difficult to understand, and most difficult to master. It is a common knowledge that most Filipinos tend to hate math, even claiming it is not one of their favorite subjects in school. This negative attitude of students towards Mathematics can bring about failure not only on the part of the students but also senior high school educators who should strive to demonstrate to their students that math can be useful, exciting, engaging and fun in order to inspire the world's next generation of logical thinkers and problem solvers. It is clear that we live in an ever increasingly scientific and technological world. Hence, changing demands from society and the continual development in the field of technology have led to a radical change in the aims and objectives of school mathematics since the beginning of 21st century.

According to the Department of Education (DepEd Order No.73, s. 2012) there are big factor in the academic achievement of students. Included under teacher skills and competencies are teaching effectiveness, professional recognition and awards, membership and participation in professional organizations, scholarly abilities and creative productiveness, and university and community service (Manual of Regulation for Private Schools, 2010).

A quality teacher is the major criterion for offering the quality education. Teacher has always been considered as one of the noblest human being and as second parent of students. Students are generally influenced by their teachers, because they spend most of their time under the guidance of teachers in schools. Having a well thought-out pedagogy can improve the quality of teaching and the way students learn, helping them gain a deeper grasp of fundamental material. Being mindful of the way you teach can help you better understand how help students achieve deeper learning. And it can, in turn, impact student perception, resulting in cooperative learning environments.

The primary emphasis in the study will be the Mathematics teachers of Public Senior High School, mainly because they are in charge in the delivery of their students' learning experiences. The effectiveness of their teaching is one of the factors that determine how well the students would fare in their journey towards knowledge acquisition. Basically, teachers play a vital role in the daily lives of their students. Instruction however is defined by various circumstantial determinations which are inescapable to teachers and administrators to give heed to. Very often the failure in the educative process is due to the passing attention given to these determinations thus defeating the objective of productivity and quality of education. These concerns are innate components of the instructional activity and these will extensively be dealt with in this research study.

The researcher is a senior high school teacher teaching Mathematics in the private school. His aspiration is to teach Mathematics effectively and efficiently so that learners will gain the desired skills set forth by the Department of Education (DepEd). Much to his desire is to spell out the difference he was confronted with on various concerns that were detrimental to the teaching Mathematics. This research intends to investigate extent of use of pedagogical approaches in Mathematics as perceived by the respondents in terms of constructivist, collaborative, inquiry-based, integrative, and reflective, and determine the difference between the pedagogical approaches and the profile of the Mathematics teachers. Findings of which may serve as benchmark to strengthen the instructional skills of Mathematics teachers in Isabela including City Divisions of Ilagan City, Cauayan City and Santiago City.

STATEMENT OF THE PROBLEM

Generally, this study attempted to appraise the pedagogical approaches in teaching and students' academic performance in Mathematics among public high schools in Isabela.

Specifically, it sought to answer the following questions:

1. What is the profile of the teachers based on the following:
   1.1 Sex
2. What is the extent of use of pedagogical approaches by the Mathematics in terms of:
   2.1 Constructivist
   2.2 Collaborative
   2.3 Inquiry – Based
   2.4 Integrative
   2.5 Reflective
3. Is there a significant difference on the use of pedagogical approaches when grouped according to the teachers' profile?

RELATED LITERATURE

Researchers presented various pedagogical approaches such as constructivism, collaborative, inquiry-based, integrative and reflective. Constructivism is an approach which attempts how learning is realized in a person's mind. Constructivist approach is a learning process which aids learners to make their knowledge meaningful and valuable in their mind (Fardanesh, 2006). This approach focuses on the learning environments which gives individuals a chance to create and construct knowledge by themselves or by discussing and sharing with other individuals. In learning by exploring, learners construct new knowledge by basing the knowledge around their surroundings (Saab et. al., 2005).

Collaborative learning is an umbrella term for a variety of educational approaches which involves joint intellectual effort by students, or students and teachers together. Usually, students are working in groups of two or more, mutually searching for understanding, solutions, or meanings, or creating a product. This approach matches with the philosophy of contemporary perspectives on learning and teaching aiming to promote higher achievement, more positive interpersonal relationships and greater psychological health, resulting in graduates being cooperative, caring, reflective, critical and creative (Yanhui Xia, 2015).

Inquiry based learning is often used as an approach to restructure aspects of teacher education and maximize the potential of learners. An inquiry-based approach to learning involves restructuring the manner in which the content is taught. Advocates of inquiry based learning argue that this restructuring will provide students with more authentic experiences into the practices of mathematics and science and will increase motivation and interest in science and mathematics. The move to inquiry based approaches requires a move from didactic teaching practices toward practices that engage students in observation, experimentation, planning and culminating in the construction of knowledge and understandings of the discipline (Engeln et.al., 2014).

Stinson et al. (2009) concluded that one of the less obvious advantages to using an integrated approach is that using a variety of forms of assessment becomes much easier than it would be using a traditional approach. Teachers should use a variety of assessment in their classrooms to engage students and to give students opportunities to show what they have learned in multiple ways rather than simply by testing.

Galvez-Martin (2000) proposed reflective teaching as the act of creating a mental space in which to contemplate a question or idea, such as, "What do I know now about teaching young children?" This of repeated questioning leads to mental transformation to a time and a situation that leads to a deeper perspective helping students

METHODOLOGY

This study used the descriptive method of research to appraise the pedagogical approaches in Mathematics used by Mathematics teachers among public high schools in Isabela. The respondents were taken from big schools in every municipality in the province of Isabela including cities of Ilagan, Cauayan and Santiago. Teacher - respondents were chosen using purposive sampling with 99% level of confidence and 5% margin of error. Out of the 123 senior high school teachers handling Mathematics in the selected big schools in the province of Isabela, a total of 104 teachers were proportionally distributed in each district.

The Instrument of the Study

To gather the needed data, the researcher developed a self-made questionnaire which consists of two parts: part I comprised the profile of the teacher-respondents while part II focused on the pedagogical approaches utilized by the mathematics teachers such as the constructivist, collaborative, inquiry-based, integrative and reflective.

The questionnaire was designed based on literature reviews and in reference to questionnaires in the related studies. To establish its content validity, it was subjected for validation by experts. The experts' suggestions were well taken and incorporated in the finalized questionnaire.

It was administered to 30 teachers in Ramon District in both Public and Private School to determine the reliability of the questionnaire. Researcher's respondents are the subject area coordinator in Mathematics and Science, and teachers teaching Mathematics in the Junior and Senior High School. Each pedagogical approach contains five item statement-indicators that describe how teachers incorporate these pedagogical approaches in their classes.

The reliability test was assessed through computing Cronbach's Alpha, which shows the reliability value of 0.94 indicating the high consistency of the responses in the items used in the questionnaire.

Statistical Tools

The data gathered were computer processed using the Statistical Package for Social Sciences (SPSS) where: Frequency and percentage counts were used to describe the profile of the respondents in terms of gender, highest educational attainment, length of service, and field of specialization; Means were used in treating the data on the pedagogical approaches used by the Mathematics Teachers; and For the difference between the use of pedagogical approaches and respondents' gender, Mann - Whitney U test was utilized. Moreover, the difference between the use of pedagogical approaches and respondents' highest educational attainment, length of service, and field of specialization, Kruskal - Wallis H test were used.

FINDINGS

Profile of the respondents

Out of 104 sampled teachers, majority were female, composed of 59 participants (56.73%), while 45 (43.27%) were male. Most of the teachers were bachelor's degree holders (66, 63.46%). There were 34 teachers (32.69%) with master's degree while 4 teachers (3.85%) have doctorate. As regards to their experience, 51 of the participants (49.04%) already spent 1 to 5 years in the service. For the remaining participants, 29 teachers (27.88%) already served for 6 to 10 years, 5 teachers (4.81%) for 11 to 15 years, and 19 teachers (18.27%) for 16 to 20 years.

PROFILE	Frequency (n = 104)	Percent 100.00
Sex		
Male	45	43.27
Female	59	56.73
Highest Educational Attainment		
Bachelor's Degree	66	63.46
Master's Degree	34	32.69
Doctorate Degree	4	3.85
Length of service		
1 to 5	51	49.04
6 to 10	29	27.88
11 to 15	5	4.81
16 to 20	19	18.27
Field of specialization		
Mathematics	81	77.88
Mathematics related course	5	4.81
Non-mathematics related course	18	17.31

Extent of Use of Pedagogical Approaches by the Mathematics Teachers in terms of Constructivist and Collaborative

Table 2 presents the extent use of pedagogical approaches by the Mathematics teachers in terms of constructivist and collaborative. As perceived by the teachers, this approach is very oftenly used. In particular, teachers lead students to brainstorm an idea for to assess their prior knowledge (4.44), teachers focus on teacher-student interaction and give series of questions related to materials to facilitate students' grasp of one or more principles. (M = 4.37), lead students to a conceptual definition and examples are given (M = 4.36), define concept and lead students to give

examples and non-examples. (4.33), and focus on teacher-student interaction and give series of questions related to materials to facilitate students' grasp of one or more principles (M = 4.30).

For the collaborative approach, as perceived by the teachers themselves and the students, teachers used this approach very often. In particular, teachers would use the think/write, pair, and share strategy as technique to encourage individual participation (M = 4.30), use brainstorming to find a conclusion for a specific problem by gathering a list of ideas spontaneously (M = 4.25), use concept mapping that allows students working in groups a way of illustrating the connections that exist between terms or concepts covered in course material (M = 3.97), use the round table to allow students to assess prior knowledge, recall information and practice communication skills (M = 3.93), and use jigsaw that gives students practice in the acquisition and presentation of new material, in review, and in informed debate (M = 3.90).

Table 2. Extent of Use of Pedagogical Approaches by the Mathematics Teachers in terms of Constructivist and Collaborative

PEDAGOGICAL APPROACHES	Teachers		Students		Grand Mean	Desc.
	Mean	Desc.	Mean	Desc.		
CONSTRUCTIVIST						
1. I lead students to brainstorm an idea for me to assess their prior knowledge.	4.44	VO	4.55	A	4.54	A
2. I define concept and lead students to give examples and non-examples.	4.33	VO	4.35	VO	4.35	VO
3. I lead students to a conceptual definition and examples are given	4.36	VO	4.16	VO	4.19	VO
4. I focus on student-student interaction and facilitate discussion among students that explore different viewpoints.	4.30	VO	4.03	VO	4.07	VO
5. I focus on teacher-student interaction and I give series of questions related to materials to facilitate students' grasp of one or more principles.	4.37	VO	4.10	VO	4.13	VO
COLLABORATIVE						
1. I use the think/write, pair, and share strategy as a cooperative learning technique that encourages individual participation.	4.30	VO	4.32	VO	4.32	VO
2. I use round table as a collaborative learning technique that allows students to assess prior knowledge, recall information and practice communication skills.	3.93	VO	4.11	VO	4.08	VO
3. I use jigsaw as a collaborative learning technique that gives students practice in the acquisition and presentation of new material, in review, and in informed debate	3.68	VO	3.93	VO	3.90	VO
4. I use concept mapping as a collaborative learning technique that allows students working in groups a way of illustrating the connections that exist between terms or concepts covered in course material	3.97	VO	4.28	VO	4.24	VO
5. I use brainstorming as a group collaborative technique by which efforts are made to find a conclusion for a specific problem by gathering a list of ideas spontaneously	4.25	VO	4.25	VO	4.25	VO

A-Always *VO-Very often*

Extent of use of pedagogical approaches by the mathematics teachers in terms of inquiry-based, integrative, and reflective

Table 3 shows the extent of use of pedagogical approaches by the mathematics teachers in terms of inquiry-based, integrative, and reflective.

For the inquiry-based approach, teachers used this approach very often. In particular, the teacher would facilitate of students' learning where students have the opportunity to fulfill their potential for intellectual, emotional, physical and psychological growth (M = 4.47), encourage them to explore the problems or scenarios, ask questions, and share ideas (M = 4.45), use the students' interests as a guide when constructing my lessons (M = 4.32), provide them with inquiry experiences that are balanced between developing their mathematical skills and concept understanding (M = 4.13), and encourage students to seek answers to their own questions (M = 4.25).

For the integrative approach, teachers used it very often. In particular, the teacher would foster an atmosphere that welcomes and encourages creativity in the classroom (M = 4.38), use appropriate mathematical concepts and real-life contexts to solve problems in both familiar and unfamiliar situations (M = 4.30), incorporate the thematic and integrated curriculum in the daily schedule and daily or weekly lesson plan (M = 4.25), use age-appropriate materials and techniques in teaching (M = 4.17), and use techno-logical and mathematics application for learning (M = 4.06).

Finally, for the reflective approach, teachers always discover what strategies works best in the classroom to enhance learning for all students, (M = 4.51). It is also used this approach very often. In particular, teachers acknowledge what students bring to the learning process (M = 4.47), they analyze the impact of task structures, such as cooperative learning groups, partner, peer, or other groupings, on students' learning (M = 4.42), adjust methods and strategies based on students' relative performance (M = 4.38), and have the genuine curiosity about the effectiveness of teaching practices, leading to experimentation and risk-taking (M = 4.36).

Table 3. Extent of use of pedagogical approaches by the mathematics teachers in terms of inquiry-based, integrative, and reflective

INQUIRY – BASED						
1. I am a facilitator of students' learning where students have the opportunity to fulfill their potential for intellectual, emotional, physical, and psychological growth.	4.47	VO	4.34	VO	4.36	VO
2. I encourage students to explore the problems or scenarios, ask questions, and share ideas.	4.45	VO	4.28	VO	4.31	VO
3. I encourage students to seek answers to their own questions	4.25	VO	4.08	VO	4.10	VO
4. I use students' interests as a guide when constructing my lessons	4.32	VO	4.08	VO	4.11	VO
5. I provide students with inquiry experiences that are balanced between developing their mathematical skills and concept understanding.	4.30	VO	4.10	VO	4.13	VO
INTEGRATIVE						
1. I incorporate the thematic and integrated curriculum in the daily schedule and daily or weekly lesson plan.	4.25	VO	4.30	VO	4.29	VO
2. I foster an atmosphere that welcomes and encourages creativity in the classroom.	4.38	VO	4.19	VO	4.21	VO
3. I used age-appropriate materials and techniques in teaching	4.17	VO	4.01	VO	4.03	VO
4. I used techno-logical and mathematics application for learning	4.06	VO	4.02	VO	4.02	VO
5. I used appropriate mathematical concepts and real-life contexts to solve problems in both familiar and unfamiliar situations.	4.30	VO	4.12	VO	4.15	VO

REFLECTIVE						
1. I am constantly discovering what strategies works best in the classroom to enhance learning for all students	4.51	A	4.38	VO	4.39	VO
2. I have genuine curiosity about the effectiveness of teaching practices, leading to experimentation and risk-taking	4.36	VO	4.22	VO	4.24	VO
3. I adjust methods and strategies based on students' relative performance	4.38	VO	4.07	VO	4.11	VO
4. I analyze the impact of task structures, such as cooperative learning groups, partner, peer, or other groupings, on students' learning	4.42	VO	4.07	VO	4.12	VO
5. I acknowledge what students bring to the learning process	4.47	VO	4.15	VO	4.19	VO

A-Always VO-Very often

Difference in the mathematics teachers' extent of use of the constructivist and collaborative pedagogical approaches according to their sex

Table 4 disclosed that there was no significant difference in the extent of use of the constructivist approach for male and female teachers since the z values with their corresponding significant values are greater than the critical values leading to the acceptance of the null hypothesis at 0.05 level of significance. This means that male and female teachers lead students to brainstorm an idea for me to assess their prior knowledge, z = 1.55, p = .12, defined concept and lead students to give examples and non-examples, z = 0.14, p = .89, lead students to a conceptual definition and examples are given, z = 0.64, p = .52, and focused on student-student interaction and facilitate discussion among students that explore different viewpoints, z = 0.25, p = .80, on the same extent. However, they differ on the extent to which they focus on teacher-student interaction and give series of questions related to materials to facilitate students' grasp of one or more principles, z = 2.11, p = .04 since it recorded a z value with its corresponding significant value lesser than 0.05 leading the rejection of the null hypothesis. This implies that under the constructivist approach, male teachers focus on teacher-student interaction and they give series of questions related to materials to facilitate students' grasp of one or more principle compared to female.

Further, it shows that there was no significant difference in the extent of use of the collaborative approach for male and female teachers since the recorded p values are greater than the critical values signifying the acceptance of null hypothesis at 0.05 level of significance. This means that male and female teachers used the think/write, pair, and share strategy as a cooperative learning technique that encourages individual participation, z = 1.10, p = .27, used round table as a collaborative learning technique that allows students to assess prior knowledge, recall information and practice communication skills, z = 0.46, p = .64, used jigsaw as a collaborative learning technique that gives students practice in the acquisition and presentation of new material, in review, and in informed debate, z = 0.36, p = .72, used concept mapping as a collaborative learning technique that allows students working in groups a way of illustrating the connections that exist between terms or concepts covered in course material, z = 0.02, p = .99, and used brainstorming as a group collaborative technique by which efforts are made to find a conclusion for a specific problem by gathering a list of ideas spontaneously, z = 0.17, p = .87, on the same extent.

Table 4. Difference in the mathematics teachers' extent of use of the constructivist and collaborative pedagogical approaches according to their sex

PEDAGOGICAL APPROACHES	Z	Sig.
CONSTRUCTIVIST		
1. I lead students to brainstorm an idea for me to assess their prior knowledge.	1.55^{ns}	0.12
2. I define concept and lead students to give examples and non-examples.	0.14^{ns}	0.89
3. I lead students to a conceptual definition and examples are given	0.64^{ns}	0.52
4. I focus on student-student interaction and facilitate discussion among students that explore different viewpoints.	0.25^{ns}	0.80
5. I focus on teacher-student interaction and I give series of questions related to materials to facilitate students' grasp of one or more principles.	2.11*	0.04
COLLABORATIVE		
1. I use the think/write, pair, and share strategy as a cooperative learning technique that encourages individual participation.	1.10^{ns}	0.27
2. I use round table as a collaborative learning technique that allows students to assess prior knowledge, recall information and practice communication skills.	0.46^{ns}	0.64
3. I use jigsaw as a collaborative learning technique that gives students practice in the acquisition and presentation of new material, in review, and in informed debate	0.36^{ns}	0.72
4. I use concept mapping as a collaborative learning technique that allows students working in groups a way of illustrating the connections that exist between terms or concepts covered in course material	0.02^{ns}	0.99
5. I use brainstorming as a group collaborative technique by which efforts are made to find a conclusion for a specific problem by gathering a list of ideas spontaneously	0.17^{ns}	0.87

**Significant* *^{ns}Not Significant*

Difference in the mathematics teachers' extent of use of the inquiry-based, integrative, and reflective pedagogical approaches according to their sex

Table 5 displays the significant difference in the mathematics teachers' extent of use of the inquiry-based, integrative and reflective pedagogical approaches when grouped according to their sex.

It is revealed that the sex of the respondents has no significant difference on their pedagogical approaches when it comes to inquiry-based, integrative, and reflective since the recorded z values are greater than the critical value leading to the acceptance of the null hypothesis at 0.05 level of significance.

In particular, there was no significant difference in the extent of use of the inquiry-based approach for male and female teachers. This means that male and female teachers facilitated students' learning where students have the opportunity to

fulfill their potential for intellectual, emotional, physical, and psychological growth, z = 1.36, p = .17, encouraged students to explore the problems or scenarios, ask questions, and share ideas, z = 0.87, p = .39, encouraged students to seek answers to their own questions, z = 0.44, p = .66, used students' interests as a guide when constructing my lessons, z = 0.11, p = .91, and provided students with inquiry experiences that are balanced between developing their mathematical skills and concept understanding, z = 0.37, p = .71, on the same extent.

Also, there was no significant difference in the extent of use of the integrative approach for male and female teachers though they do it very often) since the established z values with their corresponding significant values are greater than 0.05 leading to the acceptance of the null hypothesis. This implies that male and female teachers incorporated the thematic and integrated curriculum in the daily schedule and daily or weekly lesson plan, z = 0.50, p = .62, fostered an atmosphere that welcomes and encourages creativity in the classroom, z = 1.49, p = .14, used age-appropriate materials and techniques in teaching, z = 0.65, p = .52, used techno-logical and mathematics application for learning, z = 0.66, p = .51, and used appropriate mathematical concepts and real-life contexts to solve problems in both familiar and unfamiliar situations, z = 0.28, p = .78, on the same extent.

Finally, the extent of use of the reflective approach for male and female teachers are done very often and it recorded not significant since the established z values with their significant values are greater than 0.05 leading to the acceptance of the null hypothesis. This means that male and female teachers discovered what strategies works best in the classroom to enhance learning for all students, z = 0.55, p = .58, had genuine curiosity about the effectiveness of teaching practices, leading to experimentation and risk-taking, z = 0.70, p = .48, adjusted methods and strategies based on students' relative performance, z = 0.11, p = .91, analyzed the impact of task structures, such as cooperative learning groups, partner, peer, or other groupings, on students' learning, z = 0.28, p = .78, and acknowledge what students bring to the learning process, z = 0.02, p = .98, on the same extent.

Table 5. Difference in the mathematics teachers' extent of use of the inquiry-based, integrative, and reflective pedagogical approaches according to their sex

PEDAGOGICAL APPROACHES	Z	Sig.
INQUIRY – BASED		
1. I am a facilitator of students' learning where students have the opportunity to fulfill their potential for intellectual, emotional, physical, and psychological growth.	1.36^{ns}	0.17
2. I encourage students to explore the problems or scenarios, ask questions, and share ideas.	0.87^{ns}	0.39
3. I encourage students to seek answers to their own questions	0.44^{ns}	0.66
4. I use students' interests as a guide when constructing my lessons	0.11^{ns}	0.91
5. I provide students with inquiry experiences that are balanced between developing their mathematical skills and concept understanding.	0.37^{ns}	0.71
INTEGRATIVE		
1. I incorporate the thematic and integrated curriculum in the daily schedule and daily or weekly lesson plan.	0.50^{ns}	0.62
2. I foster an atmosphere that welcomes and encourages creativity in the classroom.	1.49^{ns}	0.14
3. I used age-appropriate materials and techniques in teaching	0.65^{ns}	0.52
4. I used techno-logical and mathematics application for learning.	0.66^{ns}	0.51
5. I used appropriate mathematical concepts and real-life contexts to solve problems in both familiar and unfamiliar situations.	0.28^{ns}	0.78
REFLECTIVE		
1. I am constantly discovering what strategies works best in the classroom to enhance learning for all students	0.55^{ns}	0.58
2. I have genuine curiosity about the effectiveness of teaching practices, leading to experimentation and risk-taking.	0.70^{ns}	0.48
3. I adjust methods and strategies based on students' relative performance.	0.11^{ns}	0.91
4. I analyze the impact of task structures, such as cooperative learning groups, partner, peer, or other groupings, on students' learning	0.28^{ns}	0.78
5. I acknowledge what students bring to the learning process.	0.02^{ns}	0.98

^{ns}*Not Significant*

Difference in the mathematics teachers' extent of use of the constructivist and collaborative pedagogical approaches according to their highest educational attainment

Table 6 shows the difference in the mathematics teachers' extent of use of the constructivist and collaborative pedagogical approaches according to their highest educational attainment.

It inferred in the table that there was no significant difference in the extent of use of the constructivist approach across teachers' highest educational attainment since the established x^2 values of all the statement-indicators are greater than the critical value signifying the acceptance of the null hypothesis at 0.05 level of significance. This means that, regardless of their highest educational attainment, teachers lead students to brainstorm an idea for them to assess their prior knowledge, defined concept and lead students to give examples and non-examples, lead students to a conceptual definition and examples are given, and focused on student-student interaction and facilitate discussion among students that explore different viewpoints, and focused on teacher-student interaction and I give series of questions related to materials to facilitate students' grasp of one or more principles, on the same extent.

Further, there was no significant difference in the extent of use of the collaborative approach across teachers' highest educational attainment though it was done very often and always. This was noted from the x^2 values of all the statement-

indicators with significant level greater than 0.05. This means that, regardless of their highest educational attainment, teachers used the think/write, pair, and share strategy as a cooperative learning technique that encourages individual participation, used round table as a collaborative learning technique that allows students to assess prior knowledge, recall information and practice communication skills, used jigsaw as a collaborative learning technique that gives students practice in the acquisition and presentation of new material, in review, and in informed debate, used concept mapping as a collaborative learning technique that allows students working in groups a way of illustrating the connections that exist between terms or concepts covered in course material, and used brainstorming as a group collaborative technique by which efforts are made to find a conclusion for a specific problem by gathering a list of ideas spontaneously, on the same extent.

Table 6. Difference in the mathematics teachers' extent of use of the constructivist and collaborative pedagogical approaches according to their highest educational attainment

PEDAGOCICAL APPROACHES	Chi-Square	Sig.
CONSTRUCTIVIST		
1. I lead students to brainstorm an idea for me to assess their prior knowledge.	2.75^{ns}	0.25
2. I define concept and lead students to give examples and non-examples.	2.89^{ns}	0.24
3. I lead students to a conceptual definition and examples are given	1.31^{ns}	0.52
4. I focus on student-student interaction and facilitate discussion among students that explore different viewpoints.	0.73^{ns}	0.69
5. I focus on teacher-student interaction and I give series of questions related to materials to facilitate students' grasp of one or more principles.	1.78^{ns}	0.41
COLLABORATIVE		
1. I use the think/write, pair, and share strategy as a cooperative learning technique that encourages individual participation.	2.36^{ns}	0.31
2. I use round table as a collaborative learning technique that allows students to assess prior knowledge, recall information and practice communication skills.	1.87^{ns}	0.39
3. I use jigsaw as a collaborative learning technique that gives students practice in the acquisition and presentation of new material, in review, and in informed debate	2.30^{ns}	0.32
4. I use concept mapping as a collaborative learning technique that allows students working in groups a way of illustrating the connections that exist between terms or concepts covered in course material	1.96^{ns}	0.37
5. I use brainstorming as a group collaborative technique by which efforts are made to find a conclusion for a specific problem by gathering a list of ideas spontaneously	0.40^{ns}	0.82

^{ns}*Not Significant*

Difference in the mathematics teachers' extent of use of the inquiry-based, integrative, and reflective pedagogical approaches according to their highest educational attainment

Table 7 displays the difference in the mathematics teachers' extent of use of the inquiry-based, integrative, and reflective pedagogical approaches according to their highest educational attainment.

The table disclosed that the extent of use of the inquiry-based approach was done very often and always by the mathematics teachers regardless of their highest educational attainment. It is noted that there was no significant difference in the inquiry-based approach across teachers' highest educational attainment since the established x^2 values of all the listed statement – indicators are greater than the value of critical value leading to the acceptance of the null hypothesis at 0.05 level of significance. This implies that regardless of their highest educational attainment, teachers facilitated students' learning where students have the opportunity to fulfill their potential for intellectual, emotional, physical, and psychological growth, encouraged students to explore the problems or scenarios, ask questions, and share ideas, encouraged students to seek answers to their own questions, used students' interests as a guide when constructing my lessons, and provided students with inquiry experiences that are balanced between developing their mathematical skills and concept understanding, on the same extent.

Mathematics teachers performed the integrative approach very often. It further inferred that there was no significant difference in the extent of use of the integrative approach across teachers' highest educational attainment. This was noted from the x^2 values of all the statement-indicators with significant level greater than 0.05 leading to the acceptance of the null hypothesis. This means that, regardless of their highest educational attainment, teachers incorporated the thematic and integrated curriculum in the daily schedule and daily or weekly lesson plan, fostered an atmosphere that welcomes and encourages creativity in the classroom, used age-appropriate materials and techniques in teaching, used techno-logical and mathematics application for learning, and used appropriate mathematical concepts and real-life contexts to solve problems in both familiar and unfamiliar situations, on the same extent.

Finally, mathematics teachers do the reflective approach very often and always. It is also reflected that there was no significant difference in the extent of use of the reflective approach across teachers' highest educational attainment since the established x^2 values of all the statement -indicators are greater than 0.05 leading to the acceptance of the null hypothesis. This means that, regardless of their highest educational attainment, teachers discovered what strategies works best in the classroom to enhance learning for all students, had genuine curiosity about the effectiveness of teaching practices, leading to experi-

mentation and risk-taking, adjusted methods and strategies based on students' relative performance, analyzed the impact of task structures, such as cooperative learning groups, partner, peer, or other groupings, on students' learning, and acknowledge what students bring to the learning process, on the same extent.

Table 7. Difference in the mathematics teachers' extent of use of the inquiry-based, integrative, and reflective pedagogical approaches according to their highest educational attainment

PEDAGOCICAL APPROACHES	Chi-Square	Sig.
INQUIRY – BASED		
1. I am a facilitator of students' learning where students have the opportunity to fulfill their potential for intellectual, emotional, physical, and psychological growth.	0.49^{ns}	0.78
2. I encourage students to explore the problems or scenarios, ask questions, and share ideas.	0.03^{ns}	0.98
3. I encourage students to seek answers to their own questions	1.81^{ns}	0.40
4. I use students' interests as a guide when constructing my lessons	1.24^{ns}	0.54
5. I provide students with inquiry experiences that are balanced between developing their mathematical skills and concept understanding.	2.91^{ns}	0.23
INTEGRATIVE		
1. I incorporate the thematic and integrated curriculum in the daily schedule and daily or weekly lesson plan.	0.84^{ns}	0.66
2. I foster an atmosphere that welcomes and encourages creativity in the classroo	0.16^{ns}	0.92
3. I used age-appropriate materials and techniques in teaching	0.28^{ns}	0.87
4. I used techno-logical and mathematics application for learning.	1.50^{ns}	0.47
5. I used appropriate mathematical concepts and real-life contexts to solve proble in both familiar and unfamiliar situations.	0.60^{ns}	0.74
REFLECTIVE		
1. I am constantly discovering what strategies works best in the classroom to enhance learning for all students	0.37^{ns}	0.83
2. I have genuine curiosity about the effectiveness of teaching practices, leading t experimentation and risk-taking.	2.76^{ns}	0.25
3. I adjust methods and strategies based on students' relative performance.	0.59^{ns}	0.74
4. I analyze the impact of task structures, such as cooperative learning groups, partner, peer, or other groupings, on students' learning	0.72^{ns}	0.70
5. I acknowledge what students bring to the learning process.	0.01^{ns}	1.00

^{ns}Not Significant

Difference in the mathematics teachers' extent of use of the constructivist and collaborative pedagogical approaches according to their length of service

Table 8 displays the difference in the mathematics teachers' extent of use of the constructivist and collaborative pedagogical approaches according to their length of service.

It is revealed that the extent of use of the constructivist approach was performed very often and always as reflected in their means ranging from 4.11-4.80 and recorded no significant difference across teachers' length of service since the established x^2 values of the statements on "teachers lead students to brainstorm an idea for them to assess their prior knowledge", "defined concept and lead students to give examples and non-examples", "lead students to a conceptual definition and examples are given", and "focused on student-student interaction and facilitate discussion among students that explore different viewpoints", with their corresponding p – values are greater than 0.05 leading to the acceptance of the null hypothesis.

However, there was a borderline-significant difference on the way they focused on teacher-student interaction and in giving series of questions related to materials to facilitate students' grasp of one or more principles since the established x^2 value is less than the critical value. This implies that respondents who are in the service between 11-15 years would do this strategy from the constructivist approach more often compared to teachers serving 1 to 5 years and even those who already served 16 to 20 years.

Further, there was no significant difference in the extent of use of the collaborative approach across teachers' length of service though it was performed very often to always. This was noted from the x^2 values of all the statement-indicators with significant level greater than 0.05 signifying the acceptance of the null hypothesis. This means that, regardless of how long they've been teaching, teachers used the think/write, pair, and share strategy as a cooperative learning technique that encourages individual participation, used round table as a collaborative learning technique that allows students to assess prior knowledge, recall information and practice communication skills, used jigsaw as a collaborative learning technique that gives students practice in the acquisition and presentation of new material, in review, and in informed debate, used concept mapping as a collaborative learning technique that allows students working in groups a way of illustrating the connections that exist between terms or concepts covered in course material, and used brainstorming as a group collaborative technique by which efforts are made to find a conclusion for a specific problem by gathering a list of ideas spontaneously, on the same extent.

Table 8. Difference in the mathematics teachers' extent of use of the constructivist and collaborative pedagogical approaches according to their length of service

PEDAGOGICAL APPROACHES	Chi-Square	Sig.
CONSTRUCTIVIST		
1. I lead students to brainstorm an idea for me to assess their prior knowledge.	5.70^{ns}	0.13
2. I define concept and lead students to give examples and non-examples.	5.87^{ns}	0.12
3. I lead students to a conceptual definition and examples are given	5.32^{ns}	0.15
4. I focus on student-student interaction and facilitate discussion among students that explore different viewpoints.	3.79^{ns}	0.29
5. I focus on teacher-student interaction and I give series of questions related to materials to facilitate students' grasp of one or more principles.	7.79*	0.05
COLLABORATIVE		
1. I use the think/write, pair, and share strategy as a cooperative learning technique that encourages individual participation.	2.10^{ns}	0.55
2. I use round table as a collaborative learning technique that allows students to assess prior knowledge, recall information and practice communication skills.	1.54^{ns}	0.67
3. I use jigsaw as a collaborative learning technique that gives students practice in the acquisition and presentation of new material, in review, and in informed debate	3.62^{ns}	0.31
4. I use concept mapping as a collaborative learning technique that allows students working in groups a way of illustrating the connections that exist between terms or concepts covered in course material	1.90^{ns}	0.59
5. I use brainstorming as a group collaborative technique by which efforts are made to find a conclusion for a specific problem by gathering a list of ideas spontaneously	4.21^{ns}	0.24

**Significant* *^{ns}Not Significant*

Difference in the mathematics teachers' extent of use of the inquiry-based, integrative, and reflective pedagogical approaches according to their length of service.

Table 9 presents the difference in the mathematics teachers' extent of use of the inquiry-based, integrative, and reflective pedagogical approaches according to their length of service.

It is showed in the table that the extent of use of the inquiry based is done by the mathematics teachers very often and always and found no significant difference in their length of service particularly in the statements, "teachers facilitated students' learning where students have the opportunity to fulfill their potential for intellectual, emotional, physical and psychological growth", "encouraged students to explore the problems or scenarios, ask questions, and share ideas", "encouraged students to seek answers to their own questions", used students' interests as a guide when constructing my lessons" since the established x^2 values have a significant values greater than 0.05 leading to the acceptance of the null hypothesis.

However, there was a significant difference on the way they provided students with inquiry experiences that are balanced between developing their mathematical skills and concept understanding, since the established x^2 value is less than the critical value (0.05) leading to the rejection of the null hypothesis. This simply means that teachers who served for 6 to 10 or 11 to 15 years would do this strategy from the inquiry-based approach more often compared to teachers serving 1 to 5 years and even those who already served 16 to 20 years. This finding is in contradiction to Xie and Sharif (2014), who found out that attitudes toward Inquiry – based approach were not related to teaching experience. Thus, teachers' experience whether serving in a long period of time is not a guarantee to adopt the said approach.

Also, there was no significant difference in the extent of use of the integrative approach across teachers' length of service since the established x^2 values of all the statement – indicators are greater than 0.05 level of significance signifying the acceptance of the null hypothesis though it was used very often. This means that, regardless of how long they've been teaching, teachers incorporated the thematic and integrated curriculum in the daily schedule and daily or weekly lesson plan, fostered an atmosphere that welcomes and encourages creativity in the classroom, used age-appropriate materials and techniques in teaching, used techno-logical and mathematics application for learning, and used appropriate mathematical concepts and real-life contexts to solve problems in both familiar and unfamiliar situations, on the same extent.

Finally, the extent of use of the reflective approach was done very often and always and found no significant difference across teachers' length of service since the established x^2 values of all the statement – indicators are greater than 0.05 level of significance leading to the acceptance of the null hypothesis. This means that, regardless of how long they've been teaching, teachers discovered what strategies works best in the classroom to enhance learning for all students, had genuine curiosity about the effectiveness of teaching practices, leading to experimentation and risk-taking, adjusted methods and strategies based on students' relative performance, analyzed the impact of task structures, such as cooperative learning groups, partner, peer, or other groupings, on students' learning, and acknowledge what students bring to the learning process, on the same extent.

Table 9. Difference in the mathematics teachers' extent of use of the inquiry-based, integrative, and reflective pedagogical approaches according to their length of service.

PEDAGOGICAL APPROACHES	Chi-Square	Sig.
INQUIRY – BASED		
1. I am a facilitator of students' learning where students have the opportunity to fulfill their potential for intellectual, emotional, physical, and psychological growth.	3.68^{ns}	0.30
2. I encourage students to explore the problems or scenarios, ask questions, and share ideas.	3.49^{ns}	0.32
3. I encourage students to seek answers to their own questions	2.36^{ns}	0.50
4. I use students' interests as a guide when constructing my lessons	1.14^{ns}	0.77
5. I provide students with inquiry experiences that are balanced between developing their mathematical skills and concept understanding.	9.06*	0.03
INTEGRATIVE		
1. I incorporate the thematic and integrated curriculum in the daily schedule and daily or weekly lesson plan.	3.32^{ns}	0.34
2. I foster an atmosphere that welcomes and encourages creativity in the classroom.	3.21^{ns}	0.36
3. I used age-appropriate materials and techniques in teaching	5.97^{ns}	0.11
4. I used techno-logical and mathematics application for learning.	2.16^{ns}	0.54
5. I used appropriate mathematical concepts and real-life contexts to solve problems in both familiar and unfamiliar situations.	4.48^{ns}	0.21
REFLECTIVE		
1. I am constantly discovering what strategies works best in the classroom to enhance learning for all students	5.70^{ns}	0.13
2. I have genuine curiosity about the effectiveness of teaching practices, leading to experimentation and risk-taking.	2.37^{ns}	0.50
3. I adjust methods and strategies based on students' relative performance.	4.87^{ns}	0.18
4. I analyze the impact of task structures, such as cooperative learning groups, partner, peer, or other groupings, on students' learning	3.11^{ns}	0.38
5. I acknowledge what students bring to the learning process.	7.34^{ns}	0.06

^{ns}*Not Significant*

Difference in the mathematics teachers' extent of use of the constructivist and collaborative pedagogical approaches according to their specialization.

Table 10 displays the difference in the mathematics teachers' extent of use of the constructivist and collaborative pedagogical approaches according to their specialization.

It is revealed that the extent of use of the constructivist approach is performed by the mathe-

matics teachers very often and always and found no significant difference across teachers' specialization since the established x^2 values of all the statement – indicators are greater than 0.05 level of significance leading to the acceptance of the null hypothesis. This implies that, regardless of their major, teachers lead students to brainstorm an idea for them to assess their prior knowledge, defined concept and lead students to give examples and non- examples, lead students to a conceptual definition and examples are given, and focused on student-student interaction and facilitate discussion among students that explore different viewpoints, and focused on teacher-student interaction and in giving series of questions related to materials to facilitate students' grasp of one or more principles, on the same extent.

Further, the extent of use of the collaborative approach are used by the mathematics teachers very often and always and found no significant difference across teachers' specialization particularly in the statements, "teachers used the think/ write, pair, and share strategy as a cooperative learning technique that encourages individual participation", "used round table as a collaborative learning technique that allows students to assess prior knowledge, recall information and practice communication skills", "used concept mapping as a collaborative learning technique that allows students working in groups a way of illustrating the connections that exist between terms or concepts covered in course Material", and "used brainstorming as a group collaborative technique by which efforts are made to find a conclusion for a specific problem by gathering a list of ideas spontaneously", since the established x^2 values have a significant level greater than 0.05 signifying the acceptance of the null hypothesis.

However, there was a significant difference on the way they used jigsaw as a collaborative learning technique that gives students practice in the acquisition and presentation of new material, in review, and in informed debate, since the established x^2 value is less than the critical values leading to the rejection of the null hypothesis at 0.05 level of significance. This implies that teachers with math-related specialization would do this strategy from the collaborative approach more often compared to teachers with math and non-math-related specializations. This finding corroborates the study of Tran (2016) which states that cooperative discussions improved the learners' skills of information exchange and sharing. The findings of his study revealed that the learners studying through Jigsaw technique found this technique more cooperative, more student-centered and less teacher-centered than teaching through traditional methods.

In addition, Zhan and Georgia (2011) also ascertained that the activities via Jigsaw technique made students more active learners, and these activities were more interesting for the students than a traditional class.

Table 10. Difference in the mathematics teachers' extent of use of the constructivist and collaborative pedagogical approaches according to their specialization

PEDAGOGICAL APPROACHES	Chi-Square	Sig.
CONSTRUCTIVIST		
1. I lead students to brainstorm an idea for me to assess their prior knowledge.	0.80^{ns}	0.67
2. I define concept and lead students to give examples and non-examples.	0.25^{ns}	0.88
3. I lead students to a conceptual definition and examples are given	1.01^{ns}	0.60
4. I focus on student-student interaction and facilitate discussion among students that explore different viewpoints.	0.74^{ns}	0.69
5. I focus on teacher-student interaction and I give series of questions related to materials to facilitate students' grasp of one or more principles.	0.74^{ns}	0.69
COLLABORATIVE		
1. I use the think/write, pair, and share strategy as a cooperative learning technique that encourages individual participation.	3.16^{ns}	0.21
2. I use round table as a collaborative learning technique that allows students to assess prior knowledge, recall information and practice communication skills.	0.63^{ns}	0.73
3. I use jigsaw as a collaborative learning technique that gives students practice in the acquisition and presentation of new material, in review, and in informed debate	6.03*	0.05
4. I use concept mapping as a collaborative learning technique that allows students working in groups a way of illustrating the connections that exist between terms or concepts covered in course material	4.42^{ns}	0.11
5. I use brainstorming as a group collaborative technique by which efforts are made to find a conclusion for a specific problem by gathering a list of ideas spontaneously	1.63^{ns}	0.44

Significant ^{ns}Not Significant

Difference in the mathematics teachers' extent of use of the inquiry-based, integrative, and reflective pedagogical approaches according to their specialization.

Table 11 presents the difference in the mathematics teachers' extent of use of the inquiry-based, integrative, and reflective pedagogical approaches according to their specialization.

It is disclosed in the table that the extent of use of the inquiry-based approach is performed very often and always and found no significant difference across teachers' specialization since the established x^2 values of all the statement – indicators are greater than 0.05 level of significance leading to the acceptance of the null hypothesis. This means that, regardless of their major, teachers facilitated students' learning where students have the opportunity to fulfill their potential for intellectual, emotional, physical, and psychological growth, encouraged students to explore the problems or scenarios, ask questions, and share ideas, encouraged students to seek answers to their own questions, used students' interests as a guide when constructing my lessons, and

provided students with inquiry experiences that are balanced between developing their mathematical skills and concept understanding, on the same extent.

Also, the extent of use of the integrative approach is used very often and always and found no significant difference in the extent of use of the integrative approach across teachers' specialization. where teachers fostered an atmosphere that welcomes and encourages creativity in the classroom, used age-appropriate materials and techniques in teaching, and used techno-logical and mathematics application for learning since the established x^2 values have significant values greater than 0.05 signifying the acceptance of the null hypothesis.

However, there was a significant difference on the integrative approach particularly on way they incorporated the thematic and integrated curriculum in the daily schedule and daily or weekly lesson plan since the established x^2 value is less than the critical value (0.05) leading to the rejection of the null hypothesis. This simply means that teachers with math-related specialization would do this strategy from the integrative approach more often compared to teachers with math and non-math-related specializations. Also, there was a significant difference on the way they used appropriate mathematical concepts and real-life contexts to solve problems in both familiar and unfamiliar situations. This means that teachers with math-related specialization would do this strategy from the integrative approach more often compared to teachers with math and non-math-related specializations.

Finally, the reflective approach was used very often and always and found no significant difference in the across teachers' specialization since the established x^2 values of all the statement – indicators are greater than 0.05 level of significance signifying the acceptance of the null hypothesis. This means that, regardless of their major, teachers discovered what strategies works best in the classroom to enhance learning for all students, had genuine curiosity about the effectiveness of teaching practices, leading to experimentation and risk-taking, adjusted methods and strategies based on students' relative performance, analyzed the impact of task structures, such as cooperative learning groups, partner, peer, or other groupings, on students' learning, and acknowledge what students bring to the learning process, on the same extent.

Table 11. Difference in the mathematics teachers' extent of use of the inquiry-based, integrative, and reflective pedagogical approaches according to their specialization

PEDAGOGICAL APPROACHES	Chi-Square	Sig.
INQUIRY – BASED		
1. I am a facilitator of students' learning where students have the opportunity to fulfill their potential for intellectual, emotional, physical, and psychological growth.	0.34^{ns}	0.84
2. I encourage students to explore the problems or scenarios, ask questions, and share ideas.	0.69^{ns}	0.71
3. I encourage students to seek answers to their own questions	0.34^{ns}	0.84
4. I use students' interests as a guide when constructing my lessons	0.24^{ns}	0.89
5. I provide students with inquiry experiences that are balanced between developing their mathematical skills and concept understanding.	0.98^{ns}	0.61
INTEGRATIVE		
1. I incorporate the thematic and integrated curriculum in the daily schedule and daily or weekly lesson plan.	5.86*	0.05
2. I foster an atmosphere that welcomes and encourages creativity in the classroom.	3.31^{ns}	0.19
3. I used age-appropriate materials and techniques in teaching	1.90^{ns}	0.39
4. I used techno-logical and mathematics application for learning.	1.29^{ns}	0.52
5. I used appropriate mathematical concepts and real-life contexts to solve problems in both familiar and unfamiliar situations.	7.06*	0.03
REFLECTIVE		
1. I am constantly discovering what strategies works best in the classroom to enhance learning for all students	1.61^{ns}	0.45
2. I have genuine curiosity about the effectiveness of teaching practices, leading to experimentation and risk-taking.	0.98^{ns}	0.61
3. I adjust methods and strategies based on students' relative performance.	0.83^{ns}	0.66
4. I analyze the impact of task structures, such as cooperative learning groups, partner, peer, or other groupings, on students' learning	0.52^{ns}	0.77
5. I acknowledge what students bring to the learning process.	0.23^{ns}	0.89

**Significant* *^{ns}Not Significant*

CONCLUSIONS

Based on the findings of the study, the following conclusions were derived:

1. Female teachers were dominant in this study. It is quite known that women dominate the teaching profession. Although in this study, the number of male mathematics teacher as respondent was quite high.
2. The most prevalent pedagogy as perceived by the teachers were the constructivist approach, followed by reflective, inquiry – based, collaborative and integrative approach, respectively. The status of educational attainment, experience, and training were not prevalent in the participants, which is alarming given that they are teachers who should be updated in content and pedagogy.
3. For the extent of used of pedagogical approaches, the most prevalent approach used by teacher is constructivist approach based on their perspective.
4. The difference on the extent of use of the pedagogical approaches across the profile variables was generally not significant. Therefore, the teacher-respondents use these approaches in the same extent regardless of sex, major, level of education, and teaching experience.

RECOMMENDATIONS

To further improve and strengthen the pedagogical approaches of the Mathematics teachers, the school administrators, as lead implementers, may develop or include in their implementation plan the strengthening of Mathematics teachers on pedagogical approaches through supervisory program and in –service trainings or Learning Action Cell (LAC) sessions. Also, they could widen their linkages and connections to involve more stakeholders so that instructional requirements can be met.

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