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TRACER STUDY OF BACHELOR OF SCIENCE IN AGRICULTURE

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ABSTRACT This study was conducted to trace the Bachelor of Science in Agriculture graduates of Guimaras State College-Baterna Campus, College of Agricultural Sciences from 2017 to 2018. The descriptive research utilizing self-made instrument was used to collect information from the seventy-four (74) graduates. A self-made instrument was used to collect information from the respondents of the study. Statistical tools used were frequency, percentages, and mean. Results revealed that the majority of the graduates of Bachelor of Science in Agriculture of the Guimaras State College for the two consecutive years were already employed, and most were in their field of specialization. Those self-employed graduates were engaged in farming or managing their farms. Additionally, the agriculture program has reached its objective to produce graduates with across-the-board knowledge in green technology, organic and sustainable agriculture, and infused with well-founded values.

Keywords: agriculture, graduates, tracer

INTRODUCTION

Institutions involved in developing human resources through long and short-term programs must keep track of the performance of their graduates to determine accountability and whether or not their programs have impacted the individual, the institution, or the country. Tracer study constitutes one form of an empirical study that provides valuable information for the education and training of a specific institution of higher education (Hazaymeh & Dela Peña, 2015). This information could help educational institutions assess the attainment of its vision, mission, and goals (Banawan & Freires, 2014). A tracer study enables the institution of higher education to get information on possible deficits in a given educational program which can serve as a basis for curricular improvement.

One fundamental problem of education and training is that they must be geared to the current and future needs of the societies undergoing social and economic change. Educational and training cannot be planned to static specifications but must be planned flexibly within the dynamic process. It is and must always remain capable of change. It must also be ensured that the country's specific circumstances in question are taken into account, such that education and training are made effective and efficient to make the best possible use of scarce resources (Schomburg, 2003).

The researchers adopted the general system theory of Abraham Maslow, Hierarchy of Educational needs. In the mid-1950s, psychologist Abraham Maslow created the famous Maslow's Hierarchy of Needs. He explained that certain needs (in the lower levels of the hierarchy) must be met before a person will try to satisfy higher-level needs. Understanding and implementing Maslow's Hierarchy is in the best interest of both the teacher and the students. Without the lowest layer of the hierarchy met, students cannot reach the next level. Each level allows students the ability and motivation to increase. Each student can move up in the hierarchy with the proper support of the teachers and school staff who must focus on Maslow's hierarchy of needs in teaching and education.

In an attempt to respond to the key challenges related to the demographic changes in societies and the changing needs of the community, the Guimaras State College-Baterna Campus, College of Agricultural Sciences policies and programs have been encouraging reforms that aim to improve the education systems efficiency to decrease youth unemployment rates, and develop graduates social capital, as well as their knowledge, skills, and competencies needed in a competitive community guided by Commission on Higher Education Mission and Vision. The purpose of this study is to trace the current status of the alumni of this institution from year the 2017 to 2018 and determine the employed and unemployed respondents. With this, the researchers were interested to conduct this study in order to track the actual status of the graduates.

Statement of the Problem

This study was conducted to trace the students of Guimaras State College-Baterna Campus, College of Agricultural Sciences from the year 2017 to 2018. Specifically, this study sought to answer the following: What is the socio-demographic profile of the graduates of Guimaras State College-Baterna Campus, College of Agricultural Sciences from the year 2017 to 2018, in terms of their age, sex, civil status, year graduated, and honor received; What is the educational profile of the graduates of Guimaras State College-Baterna Campus, College of Agricultural Sciences from the year 2017 to 2018; and What is the socio-economic profile of the graduates of Guimaras State College-Baterna Campus, College of Agricultural Sciences from the year 2017 to 2018?

METHODOLOGY

This tracer study on Guimaras State College-Baterna Campus from 2017 to 2018 employed a descriptive evaluation research design. The descriptive research design was used in describing, explaining, and validating research findings. This study was conducted at the Municipality of San Lorenzo. San Lorenzo is one of the municipalities in Guimaras wherein Guimaras State College-Baterna Campus, College of Agricultural Sciences was located. The purposive random sampling (total enumeration) was used in order to identify the target respondents of the graduates of Guimaras State College-Baterna Campus, College of Agricultural Sciences from 2017 to 2018. The respondents were selected in terms of availability and readiness to participate in the conduct of the study. A total of 74 graduates participated in this study. A self-made instrument was used to collect information from the respondents. The researchers-made questionnaire was composed of two pages. The first page of the questionnaire shows the Profile of the respondents (Independent Variable) such as age, sex, and educational background. The second page of the questionnaire shows the present status of the respondents (Dependent Variable), such as economic status, nature of work, and civil status of the respondents. The questionnaire passed the validity and reliability testing. After establishing the validity and reliability of the research instrument, the researcher sent a formal letter to the school principal of Guimaras State College-Baterna Campus, College of Agricultural Sciences, to ask permission for the conduct of the study. With the help of the school registrar, the researchers determined the number of samples to whom the questionnaire was administered. Then, the researcher personally administered the instrument to the identified respondents approved by twhe management. The responses were encoded, tallied, tabulated, and subjected to data analysis using Statistical Package of Social Sciences (SPSS) v.17 software. Appropriate statistical tools were used to answer every specific stated problem. Frequency, percentages, and mean.

RESULTS AND DISCUSSIONS

Table 1 below shows the number of graduates and employment status of the BS in Agriculture of Guimaras State College. The total number of graduates was 74, wherein 44 (59.4%) graduated in 2017, and 30 (40.5%) were in 2018. On the employment status of the respondents, out of the 74 graduates of the college, 44 (59.5%) were employed, 2 (2.7%) were self-employed, and 28 (37.8%) were unemployed.

Table 1. Number of Graduates and Employment Status

Particulars	Frequency	Percent
School Year		
2016-2017	44	59.5
2017-2018	30	40.5
Total	74	100.0
Employment status		
Employed	44	59.5
Unemployed	28	37.8
Self employed	2	2.7
Total	74	100.0

Through tracer study, an institution can evaluate the quality of education given to their graduates by knowing the graduate's placements and positions in the society which later can be used as a benchmark in producing more qualified and competitive graduates (Banawan, 2014).

wwOut of the 44 employed graduates, they have already got a position in the workplace. Some of the positions were: account supervisor, admin assistant, agriculturist 1, agri-extension worker, agricultural technician, cashier, clerk, faculty, field staff, goat handler, herd supervisor, processing officer, project coordinator, research assistant, sales representative, secretary, office staff, statistical researcher, stockman, supervisor, and Technical Education and Skills Development Authority (TESDA) trainer.

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Table 3. Job Position

Posistion	Frequency	Percent
Acct. Supervisor	1	2.3
Admin Asst.	2	4.6
Agri 1	1	2.3
Agri Extension worker	3	6.8
Agri Tech 2	1	2.3
Agricultural Technologist	1	2.3
Cashier	1	2.3
Clerk	2	4.5
Faculty	1	2.3
Field Staff	1	2.3
Goat Handler	4	9.1
Herd Supervisor	1	2.3
MFO 4	1	2.3
Processing Officer	1	2.3
Project Coordinator	1	2.3
Research Staff/Assistant	6	13.6
Sales Rep	1	2.3
Secretariat	1	2.3
Staff	9	20.5
Statistical Researcher	1	2.3
Stockman	1	2.3
Supervisor	1	2.3
TESDA Trainer	2	4.5
Total	44	100.0

Some of the graduates of BS in Agriculture have already acquired government eligibility, such that 19 (25.7%) have already passed the licensure examination for agriculture, 6 (8.1%) were civil service passers, and 55 (74.3%) have no eligibility. Out of those 55 non-eligible graduates, 39 (70.9%) did not yet take any of the licensure examinations, while 16 (29.1%) did not able to pass the eligibility examinations.

Table 4. Eligibility status

Eligibity	Frequency	Percent
LEA	19	25.7
Civil service	6	8.1
None	55	74.3
Reason of none eligibility		
Does not take any Licensure examination	39	70.9
Did not passed	16	29.1
Total	55	100.0

The graduates spent time to be able to land their first job. However, it was noble to note that majority of them acquired their job less than six months after graduation, comprising 39 (88.6%) of the total employed graduates, while only 5 (11.4%) have landed their first job within 6-12 months after graduated the degree. As to the number of jobs taken, most of the graduates or 33 (75.0%) were still on their first job, while 9 (20.5%) were already on their second job, and 3 (4.5%) were already on their third job.

Table 5. Time Spent to Land the First Job and Number of Jobs Taken

Particulars	Frequency	Percent
Time Spent to Land the First Job		
Below 6 months	39	88.6
6 months to 1 year	5	11.4
Total	44	100.0
No. of Jobs Taken		
1	33	75.0
2	9	20.5
3	2	4.5
Total	44	100.0

CONCLUSIONS

The majority of the graduates of BS in Agriculture of the Guimaras State College for the two consecutive years were already employed, and most were in their field of specialization. Those self-employed graduates were engaged in farming or managing their farms. Additionally, the agriculture program has reached its objective to produce graduates with across-the-board knowledge in green technology, organic and sustainable agriculture, and infused with well-founded values.

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REFERENCES

Banawan, M. & Freires, J.M. (2014). The Ateneo de Davao University graduate tracer: An online tool for graduate tracer studies. University Research Council. https://research.addu.edu.ph/university-funded-researches/the-ateneo-de-davao-university-graduate-tracer-an-online-tool-for-graduate-tracer-studies/

Chen, A. (1996). A Comprehensive Typology for Program Evaluation American Journal of Evaluation 17:121-130. http://www.qtafi.de/handbook_v2.pdf

Gines, A.et al. (2008). Education Psychology. Quezon City: Rex Book store http://www.qtafi.de/handbook_v2.pdf

Gronlund, N.E. (1981). Measurement and Evaluation in Teaching. New York: Macmillan Publishing Company. http://www.qtafi.de/handbook_v2.pdf

Hazaymeh, E.N.M. and Dela Peña, M.K. (2015).A tracer study of La Salle University College of Engineering Graduates. /Lasallian Research Forum https://lsu.edu.ph/application/files/1114/7193/8568/Vol._18_No._1_-_A_Tracer_Study_of_La_Salle_UniversityCollege_of_Engineering_Graduates.pdf

Maslow, (1950). Hierarchy of Needs for Learners https://resources.eln.io/maslows-hierarchy-needs-learners/

Schomburg, It. (2003). Handbook for Graduate Tracer Studies: Centre for Research on Higher Education and Work, University of Kassel, Germany http://www.qtafi.de/handbook_v2.pdf

EMPLOYMENT STATUS OF GSC GRADUATES AS INFLUENCED BY I-PLANO MO INTERVENTIONS AS PERSONALITY DEVELOPMENT APPROACH

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ABSTRACT The study was conducted to determine the employment status of GSC graduates as influenced by I-PLANO MO interventions as Personality Development Approach. Descriptive and eclectic research designs were used to describe the data gathered for the study. The gathered data for the demographic profile of the respondents were analyzed using frequency count and percentages. The respondents of the study were represented by the purposively selected grantees of the Expanded Students' Grant-in-Aid Program (ESGP-PA) and their peers who were selected based on their academic performance. The academic performance was based on their general average for AY 2016-2017. The result of the study revealed that majority of the respondents were males, taking up Bachelor of Science in Information Technology and had a very good academic performance. In addition, all of the respondents need to join the job fair while most of them need training for personality development and career path planning. Moreover, an I-PLANO MO was designed by the college to address their needs. Furthermore, after one year of graduation, all of the respondents were hired but on a contractual or casual basis, with only 25 percent hired on the Local School Board by the Department of Education.

Keywords: Personality, Packaging, Needs, Employment, Students

INTRODUCTION

Guimaras State College, the only state college in the Province of Guimaras aimed to offer curricular offerings responsive to the community's needs. This aim brought an expectation that right after graduation, the students will find a stable job that is vertically aligned. It would be easier to get a job when the graduates were able to package themselves well. In today's world, where graduates faced a volume of competition, they need to project as the best graduates. Hence, it has been a common observation that most graduates of this college cannot find a job immediately after graduation. This is the reason why, prior to graduation, the college makes sure that the graduating students would be able to start planning for a better career path. Their personality packaging needs were identified during their 3rd year of stay in the college. For the past four academic years, specifically, AY 2014-2015, AY 2015-2016, AY 2016-2017, and AY 2017-2018, the college was one among the State Universities and Colleges in the Philippines which received a 2.7M grant for educating the grantees of the Expanded Students' Grant-in-Aid Program for Poverty Alleviation (ESGP-PA) who were the beneficiaries of the "Pantawid Pamilyang Pilipino Program" (4Ps). In the Memorandum of Agreement signed by various stakeholders and partner agencies for the said program, it was mentioned that one of their many functions is to provide the grantees with better opportunities to be hired after graduation. In order to be responsive to this function, the college makes sure that necessary trainings aside from those provided academically was given to the grantees prior to their graduation. Thus, the researchers came up with an Illumination for Postgraduate Labor Attainment and New Opportunities "I-PLANO" MO program for six sessions. These sessions were brought into the open discussion as inspired by the grantees. This study was anchored on Holland's Personality-Job Fit Theory. Personality-job fit theory revolves around the idea that every organization and individual has specific personality traits. The closer the traits between the person and the company match, the higher the chance of workplace productivity and satisfaction. The best personality fit will also decrease job turnover and stress, absenteeism, and poor job satisfaction. Personality-job fit theory or person-environment (P-E) fit is a match between a worker's abilities, needs, and values and organizational demands, rewards, and values (Great Essay, 2019). This theory further states that an employee's satisfaction with their job and the likelihood of leaving the job depends on the degree to which the individual's personality matches the job environment. He also identifies five (5) basic personalities: realistic, investigative, social, conventional, and enterprising.

In order to provide valuable information about the program, the researchers were inspired to come up with a qualitative report on their personality packaging needs, how these needs were addressed, and their employment status after a year of graduation.

Statement of the Problem

This study aimed to determine the personality packaging needs of college students. Specifically, this study sought answers to the following questions: What is the demographic profile of the college students when categorized as to sex, course, and academic performance; What are the personality packaging needs of the college students in terms of career planning, personality development, and exclusive job fair; What intervention program is offered by the college to address their needs; and What is the employment status of the students a year after graduation?

METHODOLOGY

A qualitative research design was used to describe the gathered data. The respondents of this study were purposively selected. This study was conducted the main campus of Guimaras State College. An interview sheet that contained a list of 5 priority needs based on the 7 Essential Skills which every graduate needs in 2017 was given individually to them to identify the personality packaging needs and employment status of the selected students. Then, after getting the summary of their needs, the researchers come up with a plan on how to address their needs. Thus, Illumination for Postgraduate Labor Attainment and New Opportunities "I-PLANO" MO comes into an open discussion with the US Peace Corps for funding purposes and technical assistance. A Module on Personality Packaging Needs was designed for a month with the help of the US Peace Corps Volunteer. When the module was finalized, the researchers invited speakers from different agencies to handle six (6) sessions to provide the necessary training for career path planning and personality development. During the last session, an exclusive gob fair was provided to the students. Statistical tools like frequency count and percentages were only used to identify the profile of the respondents. The statistical tools used were Frequency Counts and Percentages. These were only used to identify the demographic profile of the respondents.

RESULTS AND DISCUSSIONS

Profile of the Respondents

Table 1 shows the profile of the respondents in terms of sex, terms of course, and academic performance. Using the Frequency Count and percentage, the result showed that out of the 90 respondents, 69 0r 76.67 percent were males while 21 or 23.33 percent were females. In terms of course, out of 90 respondents, 47 or 52.22 percent were taking up Bachelor of Science in Information Technology; 25 or 27.78 percent were taking up Bachelor of Secondary Education major in English; 10 or 11.11 percent were taking up Bachelor of Secondary Education major in Mathematics, and 8 or 8.89 percent were taking up Bachelor of Industrial Technology. In terms of their academic performance, out of 90, 10 or 11.11 percent had a superior performance, 72 or 80 percent had a very good performance, and 8 or 8.89 percent had a good performance.

Table 1. Profile of Respondents in Terms of Sex, Terms of Course, and Academic Performance

Particulars	frequency	percentage
Sex		
Male	69	76.67
Female	21	23.33
Total	90	100.0
Terms of Course		
BSIT	47	52.22
BSED Math	10	11.11
BSED English	25	27.78
BIT	8	8.89
Total	90	100.0
Academic Performance		
1.1 to 1.5 (Superior)	10	11.11
1.5 to 2.0 (Very Good)	72	80.0
2.1 to 2.5 (Good)	8	8.89
Total	90	100.0

Personality Packaging Needs of the College Students in Terms of Career Planning, Personality Development, and Exclusive Job Fair

Through an individual interview sheet which the respondents answered, it was found that 90 or 100 percent of them need to join the job fair; 74 or 82.22 percent of them need training for personality development; 56 or 62.22 percent of them need career path planning; 45 or 50 percent of them need language and speaking skills development training, and 44 or 48.89 percent of them need Information and Communications Technology Applications Training.

Employability skills are needed to enable graduates to cope with the changes in the labor market. Therefore, graduates need to possess higher-order skills that will enable them to continuously recognize opportunities aiming at enhancing their employability prospects and integrate the same into their life aspects (Fulgence, 2015).

Table 2. Personality Training Needs

Particulars	Frequency	Percentage
Personality Development	74	82.22
Job Fair	90	100
Carrer Path Planning	56	62.22
Speaking Skills Development Training	45	50
Information and Communications Technology Applications Training	44	48.89

Intervention Program

Out of the findings in personality packaging needs and employment status of the college students as identified and stated in Table 2 of the Result and Discussion, the researcher had come up with a Module entitled I-PLANO MO, which contained three major trainings concentrating on the top three needs of the students namely the need for the job fair, personality development and career path planning. The I-PLANO MO module preparation was done through the technical assistance provided by the US Peace Corps in the Philippines. The trainings were done in six sessions and were provided by selected experts from different agencies. The first session was done on July 26, 2017; the second-day session was held on August 9, 2017; the third-day session was held on August 16, 2017; the fourth-day session was held on August 25, 2017; the fifth-day session was held on August 30, 2017, and the last session was held on September 6, 2017.

Employment Status of the Graduates after a Year of Graduation

The respondents graduated in 2018 and they were given one year to look for a job. After one year, they were monitored as to their employment status using social media in the form of a group chat. Results of the survey indicated that 90 or 100 percent of them were employed. However, only 32 or 35.56 percent of them worked in government offices, and 58 or 64.44 percent of them worked in private agencies. Among those employed in government offices, 8 or 25 percent were hired for the Local School Board in the Department of Education. Hence, none of them got a permanent job which means all of them were hired on a contractual or casual basis.

CONCLUSION

Majority of the respondents were males, taking up Bachelor of Science in Information Technology and had a very good academic performance. All respondents need to join the job fair, while most need training for personality development and career path planning. The College designed an I-PLANO MO was designed to address their needs. After one year of graduation, all of the respondents were hired but on a contractual or casual basis

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REFERENCES

Fulgence, K. (2015). Employability of Higher Education Institutions graduates: Exploring the influence of entrepreneurship education and employability skills development program activities in Tanzania. (Doctoral Dissertation). University of Siegen, Germany. Retrieved from https://core.ac.uk/download/pdf/56726645.pdf

Great Essay (2019). Personality-job fit theory definition. https://great-home-decorations.com/personality-job-fit-theory-using-traits-to-predict-workplace-behavior/

Malikah, S. (2017). An analysis of the use of modeled talk technique in speaking class at the seventh grade in SMPN 2 dawarblandong mojokerto. Other thesis, University of Muhammadiyah Malang.

NOTCHING THE TOP SPOT: STORIES OF GSC LET TOPNOTCHERS

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ABSTRACT The Licensure Examinations for Teachers (LET) in the Philippines is one of the measures of quality education among teacher education. This study explored the success stories of the three topnotchers of Guimaras State College during 2013 to 2015 LET. The purpose of this study was to discover the factors that influenced the success of GSC LET topnotchers through their stories, taking into account their socio-demographic profile, the support given by their families, the assistance of their teachers and friends, as well as their experiences and personal views in life. Additionally, the study intended to outline influences that have impacted the informants' education and delineate the identities they forge for themselves. As students, it revealed that GSC topnotchers were characterized as bookworms, silent type, persistent, happy-go-lucky, eager to learn new things, anxious, disciplined, and God-fearing. When preparing for the LET, they had a light experience like support given by their friends and professors and challenges like difficulties in managing their time, studying several subjects, financial constraints, and dealing with pressure. The factors that characterize their academic journey were family's financial condition, difficult experiences, unique personalities, and support from friends, parents, and teachers. These factors became their motivations and inspiration as they pursue their dream to become topnotchers. Further, they realized that in preparing for the LET, one should persevere, determine, and always ask for God's guidance.

Keywords: licensure, examination, topnotchers, GSC

INTRODUCTION

Background of the Study

Licensure Examination for Teachers (LET) is a national examination regulated by the Professional Regulation Commission (PRC) and administered by the Board of Professional Teachers (BPT). As mandated by RA 7836 or known as Philippine Teachers Professionalization Act, this examination must be taken by every graduate of education courses to be able to have a license to teach in elementary and high school. Note to mention, that the performance in the licensure examination is one of the determining factors of the institution's quality of education being offered to its students. Further, Antiojo (2017) believes that LET intends to distinguish between those capable of entering the teaching profession in terms of skills and competencies measured by the examination from those who are not.

In the Philippines, all who seek to pursue teaching as a career and profession need to take the Licensure Examination for Teachers (LET) and formerly named as Philippine Board Examination for Teachers (PBET). This is a standard evaluation measure administered by the Professional Regulation Commission (PRC). PRC strongly believed that this examination would determine who among the graduates of teacher education courses are technically and academically fit to be considered 'professional teachers' (Diaz, 2013).

The LET was implemented in the Philippines by enacting Republic Act 7836, otherwise known as the "Philippine Teachers Professionalization Act of 1994. This aims to strengthen and improve not just the teachers but also the quality of education and the whole education system in general (Velasco, 2013).

This examination is given twice a year for graduates who will be teaching at the elementary or secondary levels. The examination for secondary levels consists of three (3) parts, namely: general education, professional education, and field of specialization, whereas LET for elementary level covers only the general education and professional education courses. The preparation of future teachers for both elementary and secondary education sectors is a very important function assigned to pre-service educators of Teacher Education Institutions (TEIs).

In addition, symbolic interaction theory is the construct of the "self." The self is the definition people create (through interacting with others) of who they are. It is thus also a social construction, the results of persons perceiving themselves and then developing a definition through the process of interaction (Luttrell, 2010 in de la Rama, 2014).

Guimaras State College envisions itself as the center of excellence in education and green technology generation. This vision motivates not only the people in the academe who are working hard to achieve this goal but also the students. Note to mention that the College of Teacher Education is persistent in exerting all efforts to produce topnotchers.

In 2013, the institution celebrated when Rhealyn F. Crispe got fifth place in the LET. This achievement followed when Raymund Nonato J. Alcubilla and Arlie May G. Espinosa were hailed as seventh and sixth placers respectively. In the succeeding years, the passing rates gradually decreased. Thus, the researchers were interested to study this case to determine the factors and experiences that contribute to topping the Licensure Examination for Teachers.

Objectives of the Study

This study explored the success stories of the three topnotchers of GSC during the 2013 and 2015 Licensure Examination for Teachers. Specifically, this study aimed to: (1) introduce the three LET topnotchers of GSC and delineate their characteristics; (2) discuss the experiences of the three topnotchers of GSC; (3) set out factors and how these characterized their academic journey to LET, and (4) present realizations they had as they journey in becoming topnotchers.

METHODOLOGY

This qualitative research which has taken the form of narrative inquiry, dealt primarily with the three topnotchers of GSC during the 2013 and 2015 Licensure Examination for Teachers. The purpose of this study was to discover the factors that influenced the success of GSC LET topnotchers through their stories, taking into account their socio-demographic profile, the support given by their families, the assistance of their teachers and friends, as well as their experiences and personal views in life. Additionally, the study intended to outline influences that have made an impact on the informants' education. Lastly, it is intended to delineate the identities they forge for themselves. This study involved the three (3) Licensure Examination for Teachers topnotchers: Rhealyn F. Crispe (5th Placer, 2013 LET), Raymund Nonato J. Alcubilla (7th Placer, 2015 LET), and Arlie May G. Espinosa (6th Placer, 2015 LET). The data gathered from the in-depth interview were used for the sole purpose of this research endeavor and will not be used for any other purposes. Objectivity on the part of the researcher was observed throughout this research study. The researcher initially met the informants and discussed the entire process of this research endeavor. Confidentiality of data and limitations set by the informants were agreed upon and taken into consideration. The instrument was formulated as soon as the chosen informants agreed to be a part of this research. When everything was set, the researcher scheduled a one-on-one interview with each informant to gather the desired data. The duration of this process was based on the spontaneity and responsiveness of the informants in disclosing themselves and the alertness of the researcher to derive supplementary questions to enrich the interview. As a guide to the kind of questions to be asked by the researcher regarding the areas of concern during the in-depth interview, a researcher-made interview schedule was organized. This instrument was validated by experts in the qualitative research design to assure that nothing had been omitted or altered during the conduct of the interview, a digital recorder was used upon the approval of the informants. This was also the source of the transcriptions of the narratives, which were essential for the reliability and credibility of the results of this study. The data gathered were not subjected to any computer processing. Analysis was not attempted to reduce the data to the numerical symbol but to portray what was recorded, studied, and analyzed. The recorded in-depth interview of the informants was transcribed in the actual language used. As soon as all the recorded data were transcribed, a line-by-line analysis of informants' interviews was made. To make sense of these, codes were identified to form the needed themes. However, throughout the analysis, the formed themes were reformed; some were rejected and reassessed until a set of themes emerged that could best describe the concepts that were needed for the study. *Figure 1* shows the process of data analysis.

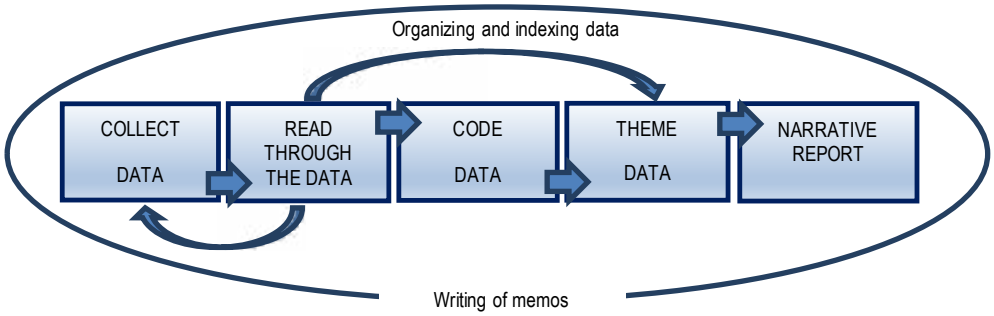

Figure 1. The procedure is undertaken in the data analysis.

RESULTS AND DISCUSSION

Who They Think They Are. This section introduces the three GSC LET topnotchers and delineates their characteristics as students and as teachers. As students, the GSC topnotchers revealed their characteristics, and these were validated by their classmates and professors. They defined themselves as bookworms, silent-type, and persistent persons. On the other hand, being happy-go-lucky, eager to learn new things, anxious, disciplined, and God-fearing are the other characteristics they think they possess.

The general idea of this unit is supported by the narrations:
"I always spend time reading books aside from the books being used in our class. Literature, history, and general reference are my favorite books to read." (RNA).
"I always spend time reading books in the library, especially general reference." (RFC)
"It does not mean that "more talk makes you brilliant and less talk no utok" I am a student who observed first before I talk." (RNA).
"I am a silent type of person. I am more on listening and observing rather than talking." (RFC)
"If they can do it, so do I. What our mind can conceive, our body can achieve. For me, goals can be achieved if you focus and be persistent even how hard it is." (RNA)
"As a student, I was disciplined, persevered and of course God-fearing." (AME)

Yearning for knowledge through reading is in consonance with the attributes set by the Philippine Professional Standards for Teachers (PPST), particularly in regards to having the ability to recognize the importance of content knowledge and interconnectedness within and across curriculum areas (D.O. No. 42, 2017).

Table 1. Characteristics of GSC LET Topnotchers

Raymund Nonato J. Alcubilla	Realyn F. Crispe	Realyn F. Crispe
Booklover/reader, Adventurous, Silent-Type, Confident and Persistent, and Happy-go-lucky	Silent-Type, Bookworm, Persistent, and Anxious	Disciplined, Persevered and God-Fearing

A Journey Worth Taking. This section outlines the experiences of the GSC topnotchers as education students and when they were preparing for the LET. These experiences are delineated as light and difficult moments. The informants' academic experiences were known to be one of the influences which equipped and motivated them to notch the top spot in the Licensure Examination for Teachers.

As students, the informants considered having opportunities to lead and gain more friends, accomplish the task, and attend the classes regularly and pass the examinations were considered as their light experiences. Likewise, the informants also experienced difficult moments like financial problems and time management.

When preparing for the LET, the informants had light experiences like support given by their friends and professors. While on this journey, they experienced challenges like difficulties in managing their time, studying several subjects, financial constraints, and dealing with pressure.
The narrations below will supplement the aforementioned ideas.

"Working and doing things/tasks as an ROTC Officer where I was trained to handle tasks and even more pressure." (RNA)

"Making and delivering my reports and doing assignments." (RFC)

"Delivering my lessons during practice teaching since I have my sister who is also a teacher who mentors me."(RFC)

"Those times when I had to attend my classes every day and pass my examinations are considered as my light moments." (AME)

"Gaining new friends. Being resourceful by borrowing reviewer to some LET passers." (RNA) and supportive instructors who gave us enjoyable review sessions make us lessen the pressure of LET." (RNA)

"I have to go back to our school library even though I am already an alumna just to read more books and do research works." (RFC)

Table 2. Academic Experiences of GS LET Topnotchers

Light Experiences	Difficult Experiences
As Student Having opportunities to lead and gain more friends, accomplish the task, and attending classes regularly, and pass the examinations. *When Preparing for LET* Support given by their friends and professors.	Having financial problems and time management. Difficulties in managing their time, studying several subjects, financial constraints, and dealing with pressure.

Agents of Academic Excellence. This section enumerates the factors that characterize the academic journey of the GSC topnotchers and how these factors influence their journey to LET. The informants identified that their family's financial condition, difficult experiences, unique personalities, and support from friends, parents, and teachers characterized their academic journey. These served as their motivations as they pursue their dream to become topnotchers.

The following narrations present us with insights of each informant about the above idea.

"I came from a family raised by a single mother. This motivated me even though how hard it is to finish my studies." (RNA)

"I don't want to see my parents doing hard labor just to buy our needs. I also don't want to be a helper for the rest of my life." (RFC)

"That is the reason why I try my best during the LET because I promise to myself that someday I will be a product that this college can be proud of." (RNA)

"My parents had inculcated in me the importance of education." (RFC)

"My personality is one of the factors that contributed to my journey as a student and as I prepare for the LET." (AME)

"It reached the point that my adviser, guidance and principal went to my house to convince me to go ba "When the opportunity came to me, I took the ALS exam without any hesitation and luckily I passed. They said the opportunity came only once so you must grab it."(RNA)

"The time I stopped schooling, I envy those who can go to college. I said to myself "If I've given a chance to enroll in college, I will do my best to graduate with honors." I do believe that intrinsic motivation is stronger than any other form of motivation. These factors motivated me to perform better in school as in preparing for LET."(RFC)

"Experiences also helped me because from those happy and hard experiences I was able to gain realizations and these realizations made me a better student and a better LET passer." (AME)

bakcck to school, but I dropped out. That is the reason why I try my best during the LET." (RNA)

"I want my teachers to be proud of me someday. My favorite teachers served as my inspiration." (RFC)

"Aside from my personality, my parents, friends, my Alma matter (GSC), and of course, my teachers had influenced me a lot. They never failed to remind me of the importance of education, and their expectations pushed me to do my best and reached my goal." (AME)

The summary of the codes is presented in Table 3.

Table 3. Factors that Characterize the Academic Journey of the GSC Topnotchers

Family's financial condition, difficult experiences, unique personalities, and support from friends, parents, and teachers

Life's Academic Dogma. This unit acquaints us with the realizations the informants had as they journey in becoming LET topnotchers. These realizations were the products of their experiences as students and when they are preparing for the LET.

As a student, the informants realized that a student should be ready and work hard in every challenge, opportunity, and education.

The narrations below will supplement the aforementioned ideas.

"Learning cannot only be found inside the classroom. Always do your best in every opportunity which came into your life. Lastly, be ready to face the challenges and never give up." (RNA)

"Education is expensive. Your lack of preparation will surely constitute an emergency on your part. Nothing in this world worth comes easy, so you have to work hard to get what you want." (RFC)

"When I was a student, it was my realization already that in order for me to finish my studies, I must bear all the unexpected circumstances that may come my way and that there is no easy way to get what you want. You really must work hard for it." (AME)

Preparing for the LET. The GSC topnotchers realized that in preparing for the LET, one should be persevere, determine, and always ask for God's guidance.
The narrations below supplement the aforementioned ideas:

"Do your best and ask for God's guidance. Triumph goes to the one who is persevered and determined." (RNA)

"Graduating with honors is not an assurance for passing the LET. If you want to pass, work for it. Your stored knowledge is very important in preparation for LET." (RFC)

"As when I prepare for the LET, I had put in my mind that in order for me to pass the LET, I must take each review session seriously, find time to review my notes, and always ask for the Lord's guidance," (AME).
Table 4 summarizes the codes.

This was similar to the finding of Albite (2019) that faith contributed to the success of the LET passers. Also, Abulon (2014) revealed that being spiritual is one of the inherent characteristics that could facilitate effective teaching in basic education.

Table 4. Informants' Realizations in Becoming LET Topnotchers

Realization in becoming LET Topnotchers
As student
A student should be ready and work hard in every challenge and opportunity and so as in education.
When Preparing for LET
One should be persevered, determined, and always ask for God's guidance.

CONCLUSIONS

The informants were known for their distinct characteristics that set them apart from the rest of the students. It could be inferred that these distinct traits were the products of developing themselves through their academic experiences. They may have realized that these characteristics are the main ingredients in their academic journey of what they want. The GSC LET topnotchers experienced light and difficult moments which makes them now one of the province's notable teachers. It could be delineated that along the way, they have acquired significant lessons that are essential in the practice of their craft. Quitting never entered their minds, despite all the adversities they have encountered, for they strongly believe that these experiences are very significant in the field of teaching. Therefore, regardless of what their experiences are, they embraced and learned from them. The informants' strong passion for teaching and their motivations could have been a great factor. With the various experiences, the informants could identify life goals and persist in their respective academic journeys. Their unique personalities and the support from their friends, parents, and teachers further motivated them and successfully made them topnotchers. The opportunities they had may have facilitated the informants to strive for academic excellence. These influences could be part and parcel of their lives, being topnotchers and good teachers. GSC LET topnotchers exhibited strong and unique identities that were honed by the varied factors that contributed to their academic journey. These ranged from their academic experiences, characteristics, personal views, and influences of the people around them. It could be inferred that these factors have directed the informants in passing the LET and eventually notch the top spot.

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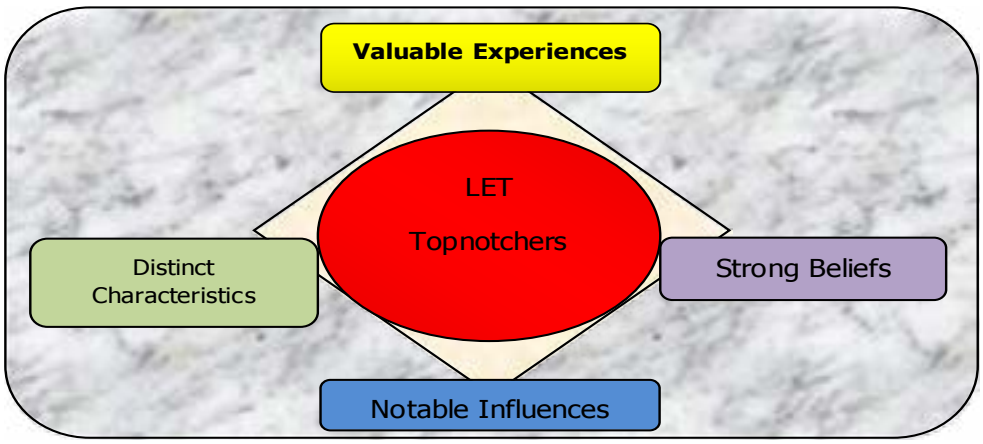

Fig. 2. Conclusions based on the findings

REFERENCES

Albite, R. P. (2019). A case study of topnotchers' preparations and contributory attributes in passing the licensure examination for teachers. *Southeastern Philippines Journal of Research and Development*, 24 (2). 45-68. https://doi.org/10.53899/spjrd.v24i2.19

Acosts A. & Acosta E. (2016).Does Teacher Licensure Matter? Basic Education Reform in the Philippine Education System. International Journal of Education ISSN 19485476 2016, Vol. 8, No. 4

Chua, P. (2018). Factors contributing to the success of Palawan State University's CPA licensure examinees. Retrieved from https://simplyeducate.me/2018/08/11/factorcontributing-to-the-success-of-palawan-stateuniversityscpa-licensure-examinees/

Estrada, M., Gascon, AJ & Lazalita LA (2015). What It Takes To Succeed In The Philippine Nursing Licensure Exam? A Retrospective Qualitative Inquiry on the Journey of Thomasian Board Topnotchers, College of Nursing, University of Santo Tomas. *American Research Journal of Nursing Original Article ISSN* 2379-2922

Guzak, K.L (2012). Engineering design motivations: a qualitative and quantitative analysis of university students, Dissertations, Master's Theses and Master's Reports. Retrieved from https://digitalcommons.mtu.edu/cgi/viewcontent.cgiarticle=1241&context=eds

Klinkenberg, LB (2013). A quantitative analysis of a mandatory student success course onfirst-time full-time student college academic progress and persistence, Graduate Theses and Dissertations. Iowa State University. Retrieved from https://lib.dr.iastate.edu/cgi/viewcontent.cgi?refererhttps://www.google.com/&htpsredir=1&article=4053&contet=etd

Professional Teaching Certification Advice (2014).Benefits of Teaching Certification. Retrieved from http://www.teachingcertificationhelp.com/benefits-of-teaching-certification.html

PRODUCTION PRACTICES OF POULTRY AND LIVESTOCK RAISERS IN THE PROVINCE OF GUIMARAS

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ABSTRACT This study was focused on investigating the production practices of poultry and livestock farmers in the Province of Guimaras. Thus, this was further to assess the following variables; poultry and livestock operation profile, sources of animals, livestock pasture feed and feed supplements, water, poultry and livestock living conditions, health management, manure management, and marketing. The farmers raised livestock animals such as cattle, pigs, carabaos, and goats, while they have also raised native and layer chickens. Livestock farmers were backyard raisers using a tethering system of owned animals. They utilized pelleted commercial feeds, but those using locally mixed feeds use rice bran, corn, and copra as feed ingredients, wherein they feed their animals on schedule. They used crossed breed, using the natural method of herd mating, wherein they considered the breed in the selecting stocks. The farmers commonly practiced vaccination, deworming, and vitamin/antibiotic supplementation for the health management of their animals. They sold their animals live as wholesale and cash on delivery basis. The common problems encountered by the farmers are diseases, adverse climatic conditions, capitalization, and marketing. Radio and television are the major sources of information. Farmers are not organic practitioners, especially on the introduction of feeds.

Keywords: production practices, poultry, livestock

INTRODUCTION

Populations of domesticated pigs, chickens, cattle, carabaos, goats, and ducks primarily represent the animal production sector of Philippine agriculture. In recent years, however, sheep, quails, and horses are gaining popularity. Except for carabaos which also provide a significant amount of draft power and its meat and milk, the primary products of the other farm animal species are for food: meat, milk, and eggs. (Medina, 2011).

The Philippines' production area reported in 2009 is 52,546 ha, employing around 70,000 producers/farmers scattered all over the country. The animal industry has been primarily in the private sector, non-governmental organizations (NGOs), and people organizations or cooperatives. These are generally produced by small-scale farmers under more diversified farming systems and are integrated with a few heads of livestock (pigs, goats, carabaos, cows, chickens, or ducks) (Lambio, 2011).

This study anchored to or led to support Executive Order 481 (EO 481) was approved by President Gloria Macapagal-Arroyo on December 27, 2005. It hopes to promote organic agriculture as a farming scheme, especially in rural farming communities; forge effective networking and collaboration with the stakeholders involved in the production, handling, processing, and marketing of organic agriculture products; guarantee food and environmental safety by means of an ecological approach to farming; and ensure the integrity of organic products through the approved organic certification procedures and organic production, handling and processing standards. This legal instrument also goes with the creation of the Bio-organic Farming Authority under the Office of the President. Other house bills have already been filed on various aspects like training programs at the barangay level to educate more farmers, extension services to groups practicing organic farming, establishing training facilities in every barangay, and granting special loans to farmers. At the municipal and barangay levels, Local Government Units are encouraged to engage in organic farming through various resolutions, master plans, and programs. Under Section 10 of the EO 481, the Department of Agriculture, through the Bureau of Agriculture and Fisheries Product Standards, shall formulate the implementing rules and regulations to carry out the provisions of the said Executive Order.

With most of its farms situated in rural areas, agricultural production and commerce are largely affected by the availability of transportation and communication facilities and other aspects of rural development. More often than not, the lack of post-harvest facilities and poor transportation and communication networks result in high postharvest losses. Losses due to inadequate transport facilities are prevalent in livestock (cattle and pigs) that are marketed to distant urban centers. Government and internationally–funded projects are being instituted to help improve these rural areas, especially when an economic potential is seen. Although the country is primarily agricultural, its food security is precarious. An increasing population within a continuously diminishing agricultural land area compounded with an increasing per capital consumption of livestock products leads to a decreasing food self-sufficiency index. (Molina, 2003). In particular, the researcher wanted to investigate further the production practices of poultry and livestock farmers in the Province of Guimaras.

Statement of the Problem

This research understanding investigated the production practices of poultry and livestock raisers in the Province of Guimaras. Specifically, this study aimed to answer the following questions:
What is the profile of the respondents when categorized to gender, civil status, age, educational attainment, monthly income (poultry and livestock), number of children, farm size/ownership, group affiliation, years in animal raising and stay in the community, other sources of income and religion; What is the profile inventory of poultry and livestock animals raised by farmers in the Province of Guimaras; What are the production practices of farmers on poultry and livestock raising in the Province of Guimaras when categorized to the type of operation, production system, sources of stocks, feeds/feed type, feed supplements, feed ingredients, feeding system, mating system, breeding methods, incubation, basis of selection, health herd management, waste disposal, sources of water, farm products produced, marketing/payment scheme, problems, and sources of information?

METHODOLOGY

The researcher employed the descriptive research design, specifically the descriptive correlational research method. The descriptive design is particularly appropriate in behavioral sciences and in finding out relationships, differences, or what prevails in the present situation, which holds opinions and beliefs, influences processes and effects, and contributes to trends and practices. This relational study allows the estimation of possible existing relationships among variables under study. This study focused on the Province of Guimaras, which is composed of five (5) municipalities. These are the Municipality of Buenavista, Jordan, San Lorenzo, Nueva Valencia, and Sibunag. The respondents of the study were all the identified farmers raising poultry and livestock animals categorized as small and large scale farmers in the entire Province of Guimaras. They were identified with the help of the Personnel from the Department of Agriculture in every municipality. The researchers used two kinds of sampling techniques. First is the purposive sampling technique since the respondents were already identified as raisers of poultry and livestock. Likewise, quota sampling was used to limit the actual number of respondents in every town in Guimaras Province. Thus, one hundred (100) farmers per town were selected, with a total of 500 farmers involved in this investigation in Sibunag. This study used the adopted questionnaire from the RI DEM Division of Agriculture and Resource Marketing (RICO Form 106, 2007) and the Livestock Farm. Practices Survey questionnaires designed by a project team made up of Statistics in Canada, 2005 entitled "Production Practices of Poultry and Livestock Animals" The instrument used was subjected to a face validation technique, also known as validation by jury opinion. This required that the test instrument is presented to a jury of experts for their opinion as to whether or not the instrument could gather the needed data as intended. The researchers developed a survey questionnaire with inputs based on interviews and feedback discussions. The researchers secured a letter of request for permission to conduct the said study to every respective office of every municipality which of having their own offices of the Department of Agriculture (DA); thus, the researchers also sent a letter to the respective raisers or farmers of poultry and livestock. Furthermore, to gather fair information from the farmers mentioned above, the researcher and trained enumerators translated the words according to the dialect spoken by the said animal raisers. Frequency count and percentage distribution to determine the socio-demographic profile of the respondents; profile inventory of poultry and
livestock animals raised by farmers in the Province of Guimaras and production practices of farmers on poultry and livestock raising the frequency count and percentage distribution were used.

RESULTS AND DISCUSSIONS

Profile of the Respondents

Table 1 presents the gender, civil status, age, and educational attainment. For gender, 57% were male and 43% were female. This implies that more males were involved in animal raising than females in San Lorenzo. As to the civil status, most of the respondents were married with 88%, 8% were widowed, and 4% were single. It has been noted that most married individuals are in animal raising because animal raising served as their additional source of income for their family.

As to age, 61 of the respondents were 51 years and older, 23 were 41-50 years old, 15 were aged of 31-40, and 2 were aged 21-30 age bracket. Data revealed that most of the animal raisers were old individuals in the community. Few young individuals were interested in animal raising.

As to educational attainment, there were 36% graduated elementary, 23% were high school graduate, 15% were elementary level, 9% were college graduate, 7% were high school level, 4% were college level, and 1% were vocational. It implies that more non-technical people are into animal raising. They have gained only knowledge in animal raising from their own experience or did not attend formal training.

Table 1. Gender, Civil Status, Age, and Educational Attainment.

Profile		Frequency	Percentage
Gender	Male	285	57
	Female	215	43
	Total	500	100
Civil Status	Single	20	4
	Married	440	88
	Widowed	40	8
	Total	500	100
Age	21-30	10	2
	31-40	75	15
	41-50	115	23
	51 & Older	300	60
	Total	500	100
Educational Attainment	Elementary Level	75	15
	Elementary Graduate	180	36
	HS Level	35	7
	HS Graduate	115	23
	College Level	20	4
	College Graduate	45	9
	Vocational	5	1
	No response	25	5
	Total	500	100

Respondents were interviewed about their monthly income from poultry and livestock production. Because of poultry production, 36% of the respondents have an income of below Php 5,000, 2% have Php 10,000 above and 1% for monthly income of Php 5,001 to Php 10,000. From livestock production, 51% have an income of below Php 5,000, 26% of the respondents for a monthly income of Php 5,001 to Php 10,000, and 1% have a monthly income of Php 10,000 or above. Data imply that respondents can have an additional income in a monthly basis for their family by engaging in animal raising. As to the number of children, we can see that 39% of the respondents have 0 to 1 child, 34% have 2 to 3 children, 13% with 4 to 5 children, 5% have 6 to 7 and only 2% have 8 to 9 children. It can be noted that most of the respondents belong to a small number of a family with 0 to 3 children.

The farm size and farm ownership were part of the respondents' profile, 79% have 1 hectare and above land, 12% of the respondents owned 0.50-0.99 hectare, and only 4% of them occupied below 0.49 hectare. Most of them owned the land they occupied (97%) and only 2% are renting. The data imply that the respondents have enough area for them to continue their engagement in animal raising. Moreover, not all animal raisers have attended formal schooling or trainings on animal raising. However, through their personal experiences based on the number of years, they develop skills and their own management system for their animals.

Table 2. Monthly Income from Poultry and Livestock Production, Number of Children, Farm Size, & Farm Ownership

Particular		Frequency	Percent
Monthly Income			
Poultry	Below Php 5,000	180	36
	Php 5,001 to Php 10,000	5	1
	Php 10,001 to above	10	2
Livestock	below 5,000	255	51
	5,001 to 10,000	130	26
	10,001 and above	5	1

Number of Children	0 to 1	195	39.0
	2 to 3	170	34.0
	4 to 5	65	13.0
	6 to 7	25	5.0
	8 to 9	10	2.0
	No Response	35	7.0
	Total	500	100
Farm Size	below 0.49 hectare	20	4.0
	0.50- 0.99 hectare	60	12.0
	1 hectare and above	395	79.0
	No response	25	5.0
	Total	500	100
Farm Ownership	Owned	490	98.0
	Rented	10	2.0
	Total	500	100

For the number of years of their engagement in animal raising, 92% of the respondents engaged for 21 years and above, 3% with 16-20 years, 2% for 1-5 years engagement, and 1% for 6-15 years respectively. Ninety-eight percent (98%) of the respondents are living more than 20 years in the community.
The sources of income of the respondents, aside from monthly income earned in animal raising, show that 88 respondents were also involved in rice and corn projects, and 58 were engaged in vegetables. This implies that respondents are not only involved in one production system, but they keep on engaging in other projects to earn more income.

Religion reveals that almost all of the respondents were Roman Catholics (93%), followed by IFI (4%), INC (1%), and Born Again (1%), respectively.

Table 3. Number of years of their engagement in animal raising and their stay in the community.

Particulars		Frequency	Percentage
Number of Years Engaged in Animal Raising	1-5 years	10	2
	6-10 years	5	1
	11-15 years	5	1
	16-20 years	15	3
Number Of Years In The Community	21 years and above	460	92
	10 to 20 years	10	2
	more than 20 years	490	98
Other Sources Of Income	Total	500	100
	Rice and corn	440	88
	Vegetables	290	58
Religion	Marine fishing	5	1
	Roman Catholic	465	93
	IFI	20	4
	INC	5	1
	Born Again	5	1
	Protestant	5	1
	Total	500	100

Inventory of the livestock and poultry animals raised by the farmers were conducted during the survey also. For the poultry, the highest population was the native chicken with 9,000, followed by layers with a total of 2,350, ducks 125, and turkeys 80 respectively. For livestock, the respondents have 830 cattle, followed by pigs with 395, carabaos with 375, goats with 235, and 5 horses. It implies that by population, the dominant group of animals raised by the respondents are the chickens, cattle, pigs, carabaos, and goats.

Table 4. Profile inventory of livestock and poultry animals raised by farmers in Guimaras.

Animal Raised		Total	Percentage
POULTRY	Layers	2,350	20.3
	Native chicken	9,000	77.9
	Ducks	125	1.1
	Turkeys	80	0.7
LIVESTOCKS	Pigs	395	21.5
	Goat	235	12.8
	Cattle	830	45.1
	Carabao	375	20.4
	Horse	5	0.3

Table 5 reveals the type of operation, production system, and sources of stocks. Most of the respondents were raising animals in a backyard operation, and 1% was commercial. These backyard raisers are practicing tethering (84%), semi-range (23%), intensive (7%), and range (6%). Although they were at a backyard level, they have already a system of managing the animals they raised because only 6% practice a range system. On the sources of stocks, 95% of them are raising stocks to produce by them, and only 5% purchased their stocks. It implies that the respondents are not used to introducing new stock to their farm for upgrading because keeping your own stocks was lead to a higher level of inbreeding.

Table 5. Type of operation, production system, and sources of stocks.

Particulars		Frequency	Percentage
Type of Operation	Backyard	495	99.0
	Semi-commercial	0	0.0
	Commercial	5	1.0
Production System	Range	30	6.0
	Semi-range	115	23.0
	Tethering	420	84.0
	Intensive	35	7.0
Sources of Stocks	Purchased	25	5.0
	Owned	475	95.0

Table 6 below reveals feeds, feed type, and feed supplements. In feeds, 58% use commercial feeds, 41% for locally mixed feed and 1% for adulterated, and most of them are using pelleted and mash feeds. Aside from feeds, respondents provided commercial supplements and organic supplements. In table 12, common feed ingredients used by the respondents are listed. Most of them are using rice bran, corn, and copra. Moreover, some are practicing scheduled feeding and the Ad libitum feeding system. However, using only three ingredients in feeding animals was limited also by the supply of nutrients.

Table 6. Feeds, feed type, and feed supplements.

Particulars		Frequency	Percentage
Feeds	Commercial	290	58.0
	Locally mixed feed	205	41.0
	Adulterated	5	1.0
Feed Type	Commercial	390	78.0
	Organic	10	2.0
	Both commercial and organic	100	20.0
Common Feed Ingredients	Rice bran	350	70.0
	Corn	225	45.0
Feeding system	Copra	50	10.0
	Ad libitum	85	17
	Scheduled feeding	320	34

Table 7 presents the breeds, mating system, breeding methods, and basis of selection. These are important to know because the data shows what type of animals the respondents are raising and the activities they have done to improve the animals under their care. On the type of breeds, most of the animals raised by the respondents are products of crossbreeding (88%) and there were upgraded animals (18%) noted during the survey. There were 77% practicing herd mating, 13% pen mating, and 1% hand mating. All of the respondents are practicing natural mating, with 92% of the respondents. Looking into the breeds of the animals, the presence of crossed animals is an indication that there are continuing efforts on animal improvement in the community. However, herd mating is very high; this is a practice of allowing the dam to be sired with other animals in the herd. This resulted from uncontrolled breeding, which causes difficulty in monitoring the bloodlines of individual animals. For poultry, almost all of the respondents are practicing natural mating. In selection, the respondents are looking at the breed with 97%, availability at 75%, growth rate at 37%, color and price at 14%, and body conformation at 12%. It is good to note that the respondents already have enough knowledge on how to select animals for breeding purposes, specifically on the breed and availability.

Table 7. Type of Breeds, mating system, breeding methods, and basis of selection.

Particulars		Frequency	Percentage
Type Of Breeds Of Animal Raised	Crossed	405	81.0
	Upgraded	90	18.0
	No response	5	1.0
Mating System	Hand mating	5	1.0
	Pen mating	65	13.0
	Herd mating	385	77.0
Breeding Methods	Natural	460	92.0
	No response	40	8.0
Incubation Of Eggs And Brooding	Natural	480	96.0
	Artificial	20	4.0
Basis Of Breeding Selection	Breed	97	97.0
	Color	14	14.0
	Body conformation	12	12.0
	Price	14	14.0
	Growth rate	37	37.0
	Availability	75	75.0

In animal raising, disease prevention is very important, because diseases may cause big losses to the farm operation. Animal raisers should have the capacity or knowledge about the activities that should be employed to prevent the presence of disease and infection or how to protect their animals from it. They must develop a herd health plan for this purpose.

The list of activities of the respondents on herd health management revealed that 77% of the raisers conducted vaccination, deworming 68%, vitamin and antibiotic supplementation 42%, provision of housing 15%, preventive medication 11%, immediate treatment and care 4%, rotational grazing 3% and 1% proper waste and dead animals disposal.

The higher percentage of vaccination and deworming were due to the efforts of local government units through their municipal agriculture office. However, it can be also noted that few of the respondents have housing for their animals, conducting preventive medication, immediate treatment and care, rotational grazing and they do not practice proper waste and dead animals disposal. These things should also be considered because these are important aspects to maintain the health condition of the animals.

On waste disposal, most of the respondents are practicing open dumping (65%), composting (17%), drainage canal (10%), and all of them do not have a septic tank for animal waste. However, almost all of the respondents take water from the onsite well for their animals.

In order to maintain the good health condition of the animals, raisers must also be responsible for waste disposal because dumping areas provide a better environment for disease-causing microorganisms to multiply and infect more animals. This was also harmful to the environment and the people living in the community.

Their sources of water for their animals are all from the site well. This is good to note that all of the raisers of San Lorenzo knew the importance of giving safe water to their animals.

Table 8. Herd health management, waste disposal, and sources of water.

Particulars		Frequency	Percentage
HERD HEALTH MANAGEMENT	Vaccination	385	77.0
	Preventive medication	55	11.0
	Provision of housing	75	15.0
	Deworming	340	68.0
	Proper waste and dead animals disposal	5	1.0
			4.0
	Immediate treatment and care	20	42.0
			3.0
	Vitamin/ Antibiotic Supplementation	210	
	Rotational grazing	15	
Waste Disposal	Drainage canal	250	10.0
	Composting	425	17.0
	Open dumping	325	65.0
Sources of Water	On site well	485	97.0
	Water district	15	3.0

Table 9 below presents the production and marketing aspect of animal production in San Lorenzo. For the animal products they produced, 93% of the respondents are marketing their animals on a live basis, 53% were involve in slaughtering and marketing fresh meat, and 25% were producing table eggs. Therefore, the raisers of San Lorenzo are much more focused on the production and marketing of animals on a live basis.

Like other agricultural enterprises, animal production is also facing problems in the operation. Moreover, the raisers should identify these to look for a possible way before those problems may arise.

On the problems in animal production of the animal raisers in the Province of Guimaras, there were 94% of the respondents answered that disease is a major problem, 90% considered the adverse climatic condition as their common problem in animal raising, 64% responded that they lack capital, 40% for marketing problem, 3% for transportation problem and 1% only for less technical knowledge.

One of the important aspects of animal production is the access of the animal raisers to information aside from attending formal training and seminars. This was a great help to them technically in the course of their operation. In marketing, 90 % of the respondents were in wholesale and only 6% were practicing farm retail. All of these were paid on a Cash-on-Delivery scheme. On the sources of information of the respondents on animal production, there were 96% of the raisers responded that they took information from the television and 88% from the radio

Table 9. Farm products, marketing, payment scheme, problems in animal production, and sources of information on animal production.

Particular		Frequency	Percentage
Farm Products Produced	Eggs	25	25.0
	Meat	53	53.0
	Live animals	93	93.0
Marketing	Wholesale	450	90.0
	Farm retail	30	6.0
Payment Scheme	Cash-on-Delivery	495	99.0
Problems in Animal Production			
	Transportation problems	15	3.0
	Adverse climatic condition	450	90.0
	Capital	320	64.0
	Marketing problem	200	40.0
	Less technical knowledge	5	1.0
	Diseases	470	94.0
Sources of Information on Animal Production			
	Radio	440	88.0
	Television	486	96.0

CONCLUSION

The livestock and poultry farmers who participated in the study were mostly male, married, 51 years old and above, elementary graduate, generated a monthly income of 5,000 and below from poultry and livestock raisings. Respondents have 1 to 3 children, having more than 1 hectare owned farm. They have already raised animals for more than 20 years since they were residing in the area. They also engaged in rice and corn farming. The farmers raised livestock animals such as cattle, pigs, carabao, and goats, while they have also raised native and layer chickens. Livestock farmers were backyard raisers using a tethering system of owned animals. They utilized pelleted commercial feeds, but those using locally mixed feeds use rice bran, corn, and copra as feed ingredients, wherein they feed their animals on schedule. They used crossed breed, using a natural method of herd mating, wherein they considered the breed in selecting stocks. The farmers commonly practiced vaccination, deworming, and vitamin/antibiotic supplementation for the health management of their animals. They sold their animals live as wholesale and cash on delivery basis.

The common problems encountered by the farmers are diseases, adverse climatic conditions, capitalization, and marketing. Radio and television are the major sources of information. Farmers are not organic practitioners, especially on the introduction of feeds.

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REFERENCES

Badgley C., Moghtader, J., Quintero, E., Zakem, E., Chappell, J., Avilés- Vázquez, K., Samulon, A and Perfecto, I. (2007). Organic Agriculture and the Global Food Supply. Renewable Agriculture and Food Systems.

Castro, A.D. (2011). Paper presented during the Roundtable Discussion on "How Sustainable is Organic Agriculture ?", NAST, PHL. Hyatt Hotel and Casino, Manila.

Lambio, A. (2011). Prospect for sustainable organic chicken and egg production in the Philippines. Paper presented during the Roundtable Discussion on "How Sustainable is Organic Agriculture?", NAST, PHL. Hyatt Hotel and Casino, Manila.

Lazo, S. H. and Gutierrez, Jr., O. (2011). Health Concerns on Organic Food: Food Safety Assurance. Paper presented during the Roundtable Discussion on "How Sustainable is Organic Agriculture?"

Maghirang, R., Dela Cruz, R., and Villareal, R. (2016). How sustainable is organic agriculture in the Philippines. Trans. Nat. Acad. Sci. & Tech. (Philippines), Vol. 33 No. 2. http://www.nast.ph/images/pdf%20files/Publications/NAST%20Transactions/NAST%202011%20Transactions%20Volume%2033%20Issue%20 No.%202/4%20How%20Sustainable%20is%20Organic%20Agriculture%20in%20the%20Phils%20 Rodel%20G.%20Maghirang%20et%20al.pdf

Medina, C. (2011). Paper presented during the Roundtable Discussion on "How Sustainable is Organic Agriculture." NAST, PHL. Hyatt Hotel and Casino, Manila.

Risku-Norja, H. And M. Mikkola. (2009). Systemic sustainability of organic farming: A review. Agronomy Research 7(Special issue II), 728–736

Scialabba, N. E. (2007). Organic Agriculture and Food Security. International Conference on Organic Agriculture and Food Security. 3-5 May. FAO, Italy

Uychiat, E. S. (2011). Paper presented during the Roundtable Discussion on "How Sustainable is Organic Agriculture?", 14 March 2011, NAST, Hyatt Hotel and Casino, Manila.

GROWTH AND YIELD PERFORMANCE OF UPLAND RICE VARIETIES APPLIED WITH GUIMARAS BOKASHI AT DIFFERENT LEVELS

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ABSTRACT

The study was conducted in Sitio Progreso, Barangay Constancia, San Lorenzo, Guimaras from June to October 2019. The split-plot design with two (2) factors replicated three (3) times was used, wherein Mainplot served as the main plot bearing the upland rice varieties such as V1-black rice and V2-red rice, and Subplot as the subplot contains the levels of bokashi as the treatments applied such as A–Positive Control (Commercial Organic Fertilizer), B–5 tons of bokashi/ha, C–10 tons of bokashi/ha, D–15 tons of bokashi/ha, and E–Negative Control (Synthetic Fertilizer). Representative plant samples per treatment were taken for the data gathering using the following parameters: in growth performance are plant height (cm), number of tillers per plant, number of leaves, and for the yield performance are the number of panicles per tiller, number of grains per panicle, yield per treatment (kg), 1000 seed weight (g), and biomass (kg). As to the growth performance of Variety 1, there were significant differences in the no. of tillers and leaves, while Variety 2 was on plant height. On the yield performance, a significant effect was observed in the weight of 1000 seeds (grams) of Variety. There is a significant difference in the number of tillers applied with treatment C (10 tons of Bokashi/ha). On the yield performance, treatment B (5 tons of Bokashi/ha) has a significant effect on the no. of panicle per tiller. Rice varieties and bokashi application interacted only on the number of tillers on the 30th day after transplanting, as supported by a significant difference.

Keywords: Growth, yield, performance, upland rice, varieties, Guimaras, bokashi,

INTRODUCTION

Background of the Study

Rice is the staple food of more than half of the world's population – more than 3.5 billion people depend on rice for more than 20% of their daily calories. Asia accounts for 90% of global rice consumption, and total rice demand continues to rise. Global rice consumption remains strong, driven by both population and economic growth, especially in many Asian and African countries (CGIAR, 2018).

Traditional rice varieties, which include pigmented and aromatic rice, possess excellent eating qualities. They have export potential but the production and utilization of these varieties are limited because of their lower yield than modern rice varieties (Anies et.al., 2014).

Organic farming and organic products are gaining momentum in the agricultural sector as they are widely promoted by the Department of Agriculture nationwide (Taguiling, 2013). Efforts to increase crop productivity must be in synergy with the improvement of soil fertility through organic fertilizer.

Bokashi is a type of fermented organic fertilizer in which the organic materials are steamed, taking advantage of the heat generated by aerobic fermentation. It is also understood as a pre-digestion of organic matter through the heat generated by the decomposition process (Orihuela, 2017). It is a natural soil amendment that can be prepared using farm-based, locally derived materials. It focuses on the preparation of organic soil and plant amendments using microbiological processes as inspired by the Nature Farming approach, first advocated by the Japanese philosopher Mokichi Okada in 1935 (R.E.A.P. Canada, 2018).

Bokashi is ready for use after only two weeks of fermentation and preparation time and is composed of low-cost, locally available materials. The Bokashi organic soil amendment has proved extremely useful for reducing chemical fertilizer use, beginning the soil rehabilitation process on farms, and initiating the conversion to organic agriculture (Samson et.al., 2006).

Objectives of the Study

The aim of this study are the followings: (1) to determine the growth and yield performance of upland rice varieties in Guimaras; (2) to determine the growth and yield performance of upland rice varieties applied with the different levels of Guimaras bokashi; and (3) To determine the interaction between the rice varieties in Guimaras and the levels of bokashi application.

METHODOLOGY

This study was conducted in Sitio Progreso, Barangay Constancia, San Lorenzo, Guimaras. The study utilized the production area of the Egaran family and was facilitated by the fourth-year students of the Bachelor of Science in Agriculture, faculty, and staff. The study started in June 2019 after the approval of the proposal and procurement of the needed materials. The study was completed in four (4) months duration. Two (2) upland rice varieties (red rice and black rice) were utilized in this study. These were obtained from the farmers in the area.

Other materials used:

The following materials were also used during the conduct of the study: Bokashi fertilizer, sacks, record book, ballpen, meter stick, ribbons, camera, weighing scale, and thermometer.

Experimental Design and Layout

The experiment was laid out using a split-plot design with two (2) factors. The main plot served as the main plot, which consists of the two (2) upland rice varieties (black and red), and Subplot as the subplot, was the levels of bokashi. Each plot has a dimension of 4X5 meters. 1 meter was the distance between blocks, 0.5 meter between treatments and 1 meter is the dimension of the border canal with a total area of 896 square meters.

Table 1. Randomization of treatments.

V1			V2		
B1	B2	B3	B1	B2	B3
A	C	C	E	D	C
C	B	B	B	C	B
D	E	D	C	E	A
B	D	A	D	B	D
E	A	E	A	A	E

Legend:

Mainplot – Rice Varieties
V1 – Variety 1 (Black Rice)
V2 – Variety 2 (Red Rice)

Subplot –Levels of Bokashi
A – Positive Control (Commercial Organic Fertilizer)
B – 5 tons of bokashi/ha
C – 10 tons of bokashi/ha
D – 15 tons of bokashi/ha
E – Negative Control (Synthetic Fertilizer)

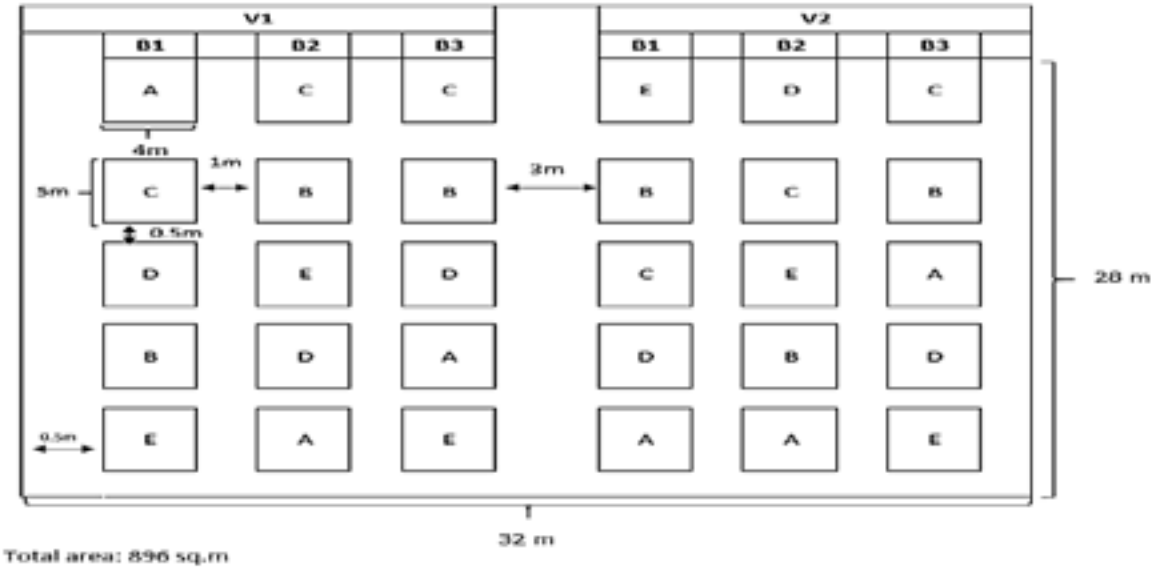

Figure 2.1 Experimental layout of the study arrange in a split-plot design.

Soil and Fertilizer Analysis. Soil samples were randomly taken in each area for testing soil content after land preparation. Ten (10) representative soil samples were collected and mixed to form one composite sample. This was air dried and 1 kg of it was packed and sent to the laboratory together with the Guimaras Bokashi.

Land Preparation and Plot Establishment. The land was plowed, harrowed, and leveled for a week. The field was made into thirty (30) plots, measuring 4x5 meters. Border canals are measured at 0.5 meter and drainage canals are 1 meter between blocks and 0.5 meter between treatments. Each plot was enclosed with a dike measuring 1 foot as a border to retain water, as well as the fertilizer.

Seed Preparation. Two (2) kilograms of each rice seed variety were soaked for 48 hours and were drained to allow seed germination. Separate plots were broadcasted with germinated seeds. Germinated seeds were grown for 20 days before transplanting to the main plots or the study area.

Transplanting. Seedlings were equally transplanted to the study area following the planting distance of 25x25 cm per plot.

Fertilization. The bokashi treatments were applied two weeks before transplanting. However, the negative control or the synthetic fertilizer was applied as basal fertilizer since it can easily be volatilized.

Pest and Disease Management. To prevent pests and disease infestation, the field was thoroughly prepared and sanitized by clearing and monitoring pests and diseases. Once there was a pest infestation, natural farming system concoctions, smoked vinegar, and other plant-based pesticides were used.

Harvesting. Rice was manually harvested within 100-120 days after transplanting using a scythe. It was manually threshed to determine the production level in each treatment as well as the overall production of the study.

There were representative plant samples per treatment that were taken within the net plot. This is located in the middle part of each plot and samples were marked using bamboo sticks. One (1) meter from both sides of the plot was used as the buffer zone. So, the net plot has an area of 3 sq.m. These sample plants served as experimental plants for the data gathering throughout the study.

The data were gathered using the following parameters:

Growth performance: There were ten (10) representative plant samples per replication that were taken within the net plot.

Plant height: The plant height was measured every 30, 45, and 60 days after transplanting using a meter stick. The plant was measured from its base to the tip of the tallest leaf.

Number of tillers per plant: The tillers were counted every 30, 45, and 60 days after transplanting.

Number of leaves: The leaves of each sample plant were counted every 30, 45, and 60 days after transplanting

Yield Performance: There were ten (10) representative plant samples per replication that were taken within the net plot.

Number of panicles per tiller: The number of panicle/tiller was counted and recorded.

Number of grains per panicle: The number of grains per panicle was counted and recorded.

Yield per treatment: The total harvested grains in each treatment were weighed in kilograms.

1000 seed weight: 1000 seed/grain was counted and weighed.

Biomass: Rice biomass per treatment was weighed after the study.

Yield per treatment: The total harvested grains in each treatment were weighed in kilograms.
1000 seed weight: 1000 seed/grain was counted and weighed.
Biomass: Rice biomass per treatment was weighed after the study.

The data gathered were sorted, tallied, tabulated, computed, and analyzed using two-way Analysis of Variance (ANOVA) of Split-Plot design at 1% and 5% levels to test its significance among treatments. If the data showed a significant effect, the means were compared using Duncan's Multiple Range Test (DMRT) to determine the most significant treatment.

RESULTS AND DISCUSSION

Plant Height

Table 2 shows the height of rice in Mainplot (rice varieties) on the 30th, 45th, and 60th day after transplanting (DAT) in centimeters. Column 2 presents the height of rice varieties on the 30th day after transplanting. Analysis of variance shows a significant difference in the height of rice. Variety 2 (Red rice) got the highest mean of 53.9 cm compared to variety 1 (Red rice) with a mean of 50.7 cm. This implies that black rice performs well on the 30th day after transplanting. The coefficient of variance is 6%.

Column 3 of Table 2 presents the height of rice in 45th days after transplanting. Analysis of variance shows a highly significant difference, wherein variety 2 (Red rice) got the highest mean of 76.8 cm, while variety 1 (Red rice) got a mean of 67.5 cm. This implies that black rice performs well on the 45th day after transplanting. The coefficient of variance is 5%.

Column 4 of Table 2 presents the height of rice varieties in 60th days after transplanting. Analysis of variance shows a highly significant difference wherein, variety 2 (Red rice) got the highest mean of 92.7 cm, while variety 1 (Red rice) got a mean of 85.1 cm. This implies that red rice performs well on the 60th day after transplanting. The coefficient of variance is 4%.

Table 2. Height of rice in Mainplot (Rice varieties) in 30, 45, and 60 days after transplanting (DAT) in centimeters.

Mainplot (Rice Varieties)	30DAT	45DAT	60DAT
V1 (Black rice)	50.7b	67.5b	85.1b
V2 (Red rice)	53.9a	76.8a	92.7a
f-test	*	**	**
cv%	6%	5%	4%

Table 3 shows the height of rice varieties in the Subplot (levels of bokashi) on the 30th, 45th, and 60th days after transplanting (DAT) in centimeters. Column 2 presents the height of rice varieties on the 30th day after transplanting. Analysis of variance shows no significant difference among treatment means. This implies that all treatments have the same performance in the height of rice varieties. The coefficient of variance is 7%.

Column 3 of shows the height of rice varieties on the 45th days after transplanting. Treatment E (Negative control-synthetic fertilizer) got the highest mean of 77.8 cm, followed by treatment D (15 tons of Bokashi/ha) with 90 72.9 cm, then treatment B (5 tons of Bokashi/ha) with 71.1 cm, treatment C (10 tons of Bokashi/ha) with 69.8 cm, and treatment A (Positive control-Commercial Organic Fertilizer) got the lowest mean of 69.2 cm.

Analysis of variance shows a highly significant difference among treatment means. This implies that synthetic fertilizer application brought the most significant effect compared to treatments treated with different levels of bokashi fertilizers and commercial organic fertilizers which have the same effects. The coefficient of variance is 4%. olumn 4 shows the height of rice varieties on the 60th days after transplanting. Treatment E (Negative control-synthetic fertilizer) got the highest mean of 95.4 cm, followed by treatment D (15 tons of Bokashi/ha) with a mean of 90 cm, then treatment B (5 tons of Bokashi/ha) with a mean of 86.9 cm, treatment C (10 tons of Bokashi/ha), and treatment A (Positive Control-Commercial Organic Fertilizer) got the lowest mean of 85.4 cm. Analysis of variance shows a highly significant effect among treatment means. The coefficient of variance is 5%.

Table 3. Height of rice varieties in Subplot (Levels of bokashi) in 30, 45, and 60 days after transplanting (DAT) in centimeters.

Subplot (Levels of Bokashi)	30DAT	45DAT	60DAT
A - Positive Control (Commercial Organic Fertilizer)	49.8	69.2b	85.4c
B - 5 tons of Bokashi/ha	51.5	71.1b	86.9c
C - 10 tons of Bokashi /ha	52.7	69.8b	86.7c
D - 15 tons of Bokashi/ha	52.8	72.9b	90.0b
E - Negative Control (Synthetic Fertilizer)	54.7	77.8a	95.4a
f-test	ns	**	**
cv%	7%	4%	5%

Table 4 shows the treatment interactions of Mainplot and 2 in 30, 45, and 60 days after transplanting (DAT) in terms of height in centimeters. Column 2 shows the height of rice varieties treated with different levels of bokashi 30 days after transplanting. Analysis of variance shows no significant difference among treatment means. This implies that levels of bokashi, commercial organic, and synthetic fetilizer has the same effect on the height of rice varieties 30 days after transplanting. The coefficient of variance is 7%.

Column 3 of Table 4 shows the height of rice varieties treated with different levels of bokashi 45 days after transplanting. Analysis of variance shows no significant difference among treatment means. This implies that levels of bokashi, commercial organic, and synthetic fertilizer have the same effect on the height of rice varieties 45 days after transplanting. The coefficient of variance is 4%.

Column 4 of Table 4 shows the height of rice varieties treated with different levels of bokashi 60 days after transplanting. Analysis of variance shows no significant difference among treatment means. This implies that levels of bokashi, commercial organic, and synthetic fertilizer have the same effect on the height of rice varieties 60 days after transplanting. The coefficient of variance is 5%.

Table 4. Treatment interactions in height of main plot and subplot in 30, 45, and 60 days after transplanting (DAT) in centimeters.

Mainplot * Subplot	30DAT	45DAT	60DAT
V1A1 – Black rice * Positive Control (Commercial Organic Fertilizer)	49.3	66.0	83.1
V1B1 - Black rice * 5 tons of Bokashi/ha	48.6	65.7	82.4
V1C1 - Black rice * 10 tons of Bokashi/ha	51.9	65.3	83.5
V1D1 - Black rice * 15 tons of Bokashi/ha	49.1	66.1	83.9
V1E1 - Black rice * Negative Control (Synthetic Fertilizer)	54.9	74.5	92.7
V2A2 – Red rice * Positive Control (Commercial Organic Fertilizer)	50.2	72.3	87.7
V2B2 – Red rice * 5 tons of Bokashi/ha	54.5	76.5	91.5
V2C2 – Red rice * 10 tons of Bokashi/ha	53.5	74.3	89.9
V2D2 – Red rice * 15 tons of Bokashi/ha	56.6	79.7	96.2

Mainplot * Subplot	30DAT	45DAT	60DAT
V2E2 – Red rice * Negative Control (Synthetic Fertilizer) f-test cv%	54.4 Ns 7%	81.1 Ns 4%	98.2 Ns 5%

Number of Tillers

Table 5 shows the number of rice tillers in Mainplot (rice varieties) in 30, 45, and 60 days after transplanting (DAT). Column 2 presents the no. of rice tillers 30 days after transplanting. Analysis of variance shows no significant difference among treatment means. This implies that all treatments have the same performance as to the no. of rice tillers 30 days after transplanting. The coefficient of variance is 9%.

Column 3 of Table 5 shows the number of rice tillers in Mainplot (rice varieties) 45 days after transplanting. Analysis of variance shows a highly significant difference in the number of tillers. Variety 1 (Black rice) has a better performance compared to variety 2 (Red rice) in terms of the no. of rice tillers 45 days after transplanting. The coefficient of variance is 20%.

Column 4 of Table 5 shows the number of rice tillers in Mainplot (rice varieties) 60 days after transplanting. Analysis of variance shows a highly significant difference in the number of rice tillers. Variety 1 (Black rice) performed well compared to variety 2 (Red rice) in terms of the no. of rice tillers 60 days after transplanting. The coefficient of variance is 17%.

Table 5. No. of rice tillers in Mainplot (Rice varieties) in 30, 45, and 60 days after transplanting (DAT).

Mainplot (Rice Varieties)	30DAT	45DAT	60DAT
V1 (Black rice) V2 (Red rice) f-test cv%	5.5 5.8 ns 9%	10.6a 8.4b ** 20%	9.7a 7.1b ** 17%

Table 6 shows the number of rice tillers in the Subplot (levels of bokashi) in 30, 45, and 60 days after transplanting (DAT). Column 2 presents the no. of rice tillers 30 days after transplanting. Analysis of variance shows the significant difference among treatment means. Treatment C (10 tons of Bokashi/ha) got the highest mean of 6.3, followed by treatment D (15 tons of Bokashi/ha) with a mean of 5.7, then treatment E (Negative control-synthetic fertilizer) with a mean of 5.6, treatment A (Positive Control-Commercial Organic Fertilizer) with a mean of 5.5, and treatment B (5 tons of Bokashi/ha) got the lowest mean of 5.3. This implies that the application of treatment C (10 tons of Bokashi/ha) brought a significant effect on the number of tillers 30 days after transplanting. The coefficient of variance is 10%.

Column 3 of Table 6 shows the number of rice tillers in Subplot (levels of bokashi) 45 days after transplanting. Analysis of variance shows no significant difference in the number of tillers. The coefficient of variance is 16%.

Column 4 of Table 6 shows the number of rice tillers in Subplot (levels of bokashi) 60 days after transplanting. Analysis of variance shows no significant difference in the number of tillers. The coefficient of variance is 20%.

Table 6. No. of rice tillers in Subplot (Levels of bokashi) in 30, 45, and 60 days after transplanting (DAT).

Subplot (Levels of Bokashi)	30DAT	45DAT	60DAT
A - Positive Control (Commercial Organic Fertilizer)	5.5b	10.8	9.4
B - 5 tons of Bokashi/ha	5.3b	9.4	8.4
C - 10 tons of Bokashi /ha	6.3a	8.8	7.4
D - 15 tons of Bokashi/ha	5.7b	8.9	7.7
E - Negative Control (Synthetic Fertilizer)	5.6b	9.9	9.2 ns
f-test	*	ns	
cv%	10%	16%	20%

Table 7 shows the treatment interactions of Mainplot and Subplot in 30, 45, and 60 days after transplanting (DAT) in terms of the number of tillers. Column 2 shows the tillers of rice varieties treated with different levels of bokashi 30 days after transplanting. Data shows that treatment V1C1 (Black rice * 10 tons of bokashi/ha) got the highest mean of 6.8, followed by treatment V2D2 (Red rice * 15 tons of bokashi/ha) with a mean of 6.3, treatment V2E2 (Red rice * Negative Control-Synthetic Fertilizer) got a mean of 6.1, then 5.8 was the mean of treatment V2C2 (Red rice * 10 tons of bokashi/ha), another is 5.5 which is the mean of treatment V2A2 (Red rice * Positive Control-Commercial Organic Fertilizer), both treatments V2B2 (Red rice * 5 tons of bokashi/ha) and V1A1 (Black rice * Positive Control-Commercial Organic Fertilizer) got a mean of 5.4, treatment V1B1 (Black rice * 5 tons of bokashi/ha) got a mean of 5.2, and both treatments V1C1 (Black rice * 10 tons of bokashi/ha) and V1E1 (Black rice * Negative Control-Synthetic Fertilizer) got the lowest mean of 5.1. Analysis of variance shows the significant difference among treatment means. This implies that black rice treated with 10 tons of bokashi/ha (V1C1), has the most significant performance among treatment means. The coefficient of variance is 10%.

Column 3 of Table 7 shows the tillers of rice varieties treated with different levels of bokashi 45 days after transplanting. Analysis of variance shows no significant difference among treatment means. This implies that levels of bokashi, commercial organic, and synthetic fertilizer have the same effect on the number of the tiller of rice varieties 45 days after transplanting. The coefficient of variance is 16%.

Column 4 of Table 7 shows the tillers of rice varieties treated with different levels of bokashi 60 days after transplanting. Analysis of variance shows no significant difference among treatment means. This implies that levels of bokashi, commercial organic, and synthetic fertilizer have the same effect on the tillers of rice varieties 60 days after transplanting. The coefficient of variance is 20%.

Table 7. Treatment interactions of Mainplot and Subplot as to the no. of tillers in 30, 45, and 60 days after transplanting (DAT) in centimeters.

Main plot*subplot	30DAT	45DAT	60DAT
V1A1–Black rice * Positive Control (Commercial Organic Fertilizer)	5.4c	11.2	11.2
V1B1 - Black rice * 5 tons of Bokashi/ha	5.2c	10.5	9.7
V1C1 - Black rice * 10 tons of Bokashi/ha	6.8a	10.5	8.2
V1D1 - Black rice * 15 tons of Bokashi/ha	5.1c	10.2	8.7
V1E1 - Black rice * Negative Control (Synthetic Fertilizer)	5.1c	10.7	10.9
V2A2 – Red rice * Positive Control (Commercial Organic Fertilizer)	5.5c	10.3	7.6
V2B2 – Red rice * 5 tons of Bokashi/ha	5.4c	8.3	7.2
V2C2 – Red rice * 10 tons of Bokashi/ha	5.8bc	7.0	6.6
V2D2 – Red rice * 15 tons of Bokashi/ha	6.3ab	7.5	6.6
V2E2 – Red rice * Negative Control (Synthetic Fertilizer)	6.1ab	9.0	7.6
f-test	*	ns	ns
cv%	10%	16%	20%

Number of Leaves

Table 8 shows the number of leaves in Mainplot (rice varieties) in 30, 45, and 60 days after transplanting (DAT). Column 2 presents the no. of leaves 30 days after transplanting. Analysis of variance shows no significant difference among treatment means. This implies that all treatments have the same performance as to the no. of leaves. The coefficient of variance is 19%.

Column 3 of Table 8 shows the number of leaves in Mainplot (rice varieties) 45 days after transplanting. Analysis of variance shows a significant difference in the number of leaves. V1 (black rice) has the highest mean of, 39 while V2 (red rice) has a mean of only 33.6. Variety 1 (Black rice) has a better performance compared to variety 2 (Red rice). The coefficient of variance is 11%.

Column 4 of Table 8 shows the number of leaves in Mainplot (rice varieties) 60 days after transplanting. Analysis of variance shows a highly significant difference in the number of leaves. Variety 1 (Black rice) performed well compared to variety 2 (Red rice). The coefficient of variance is 17%.

Table 8. No. of leaves in Mainplot (Rice varieties) in 30, 45, and 60 days after transplanting (DAT).

Mainplot (Rice Varieties)	30DAT	45DAT	60DAT
V1 (Black rice)	17.8	39.0a	39.1a
V2 (Red rice)	20.4	33.6b	27.9b
f-test	ns	*	**
cv%	19%	11%	17%

Table 9 shows the number of leaves in the Subplot (levels of bokashi) in 30, 45, and 60 days after transplanting (DAT). Column 2 presents the no. of leaves 30 days after transplanting. Analysis of variance shows no significant difference among treatment means. This implies that all treatments have the same performance as to the no. of leaves. The coefficient of variance is 20%.

Column 3 of Table 9 shows the number of leaves in Subplot (levels of bokashi) 45 days after transplanting. Analysis of variance shows no significant difference among treatment means. This implies that all treatments have the same performance as to the no. of leaves. The coefficient of variance is 16%.

Column 4 of Table 9 shows the number of leaves in Subplot (levels of bokashi) 60 days after transplanting. Analysis of variance shows no significant difference among treatment means. This implies that all treatments have the same performance as to the no. of leaves. The coefficient of variance is 22%.

Table 9. No. of leaves in Subplot (Levels of bokashi) in 30, 45, and 60 days after transplanting.

Subplot (Levels of Bokashi)	30DAT	45DAT	60DAT
A - Positive Control	17.3	38.5	37.3
(Commercial Organic Fertilizer)	19.1	36.7	32.4
B - 5 tons of Bokashi/ha	19.8	31.9	27.4
C - 10 tons of Bokashi /ha	21.4	36.6	31.3
D - 15 tons of Bokashi/ha	18.0	37.7	39.3
E - Negative Control (Synthetic Fertilizer)	ns	ns	ns
f-test	20%	16%	22%
cv%			

Table 10 shows the treatment interactions of Mainplot and 2 in 30, 45, and 60 days after transplanting (DAT) in terms of the number of leaves. Column 2 presents the no. of leaves 30 days after transplanting. Analysis of variance shows no significant difference among treatment means. This implies that all treatments have the same performance as to the no. of leaves. The coefficient of variance is 20%.

Column 3 of Table 10 shows the number of leaves of rice varieties treated with different levels of bokashi 45 days after transplanting. Analysis of variance shows no significant difference among treatment means. This implies that all treatments have the same performance as to the no. of leaves. The coefficient of variance is 16%.

Column 4 of Table 10 shows the number of leaves of rice varieties treated with different levels of bokashi 60 days after transplanting. Analysis of variance shows no significant difference among treatment means. This implies that all treatments have the same performance on the number of leaves. The coefficient of variance is 22%.

Table 10. Treatment interactions of Mainplot and 2 as to the no. of leaves in 30, 45, and 60 days after transplanting (DAT).

Main plot*subplot	30DAT	45DAT	60DAT
V1A1 – Black rice * Positive Control (Commercial Organic Fertilizer)	17.0	39.2	41.0
V1B1 - Black rice * 5 tons of Bokashi/ha	17.0	39.4	39.2
V1C1 - Black rice * 10 tons of Bokashi/ha	20.0	35.8	31.7
V1D1 - Black rice * 15 tons of Bokashi/ha	19.4	40.4	37.3
V1E1 - Black rice * Negative Control (Synthetic Fertilizer)	15.8	40.2	46.6
V2A2 – Red rice * Positive Control (Commercial Organic Fertilizer)	17.5	37.9	33.6
V2B2 – Red rice * 5 tons of Bokashi/ha	21.2	34.0	25.5
V2C2 – Red rice * 10 tons of Bokashi/ha	19.6	28.1	23.2

V2D2 – Red rice * 15 tons of Bokashi/ha	23.4	32.7	25.3
V2E2 – Red rice * Negative Control (Synthetic Fertilizer)	20.2	35.2	32.0
f-test	ns	ns	ns
cv%	20%	16%	22%

Yield Performance

Table 11 shows the yield performance of rice varieties in terms of the no. of panicle per tiller, no. of grains per panicle, yield per treatment (kgs), 1000 seed wt. (grams), and rice biomass (kg). Column 2 presents the no. of panicles per tiller of rice varieties. Analysis of variance shows no significant difference among treatment means. This implies that both varieties have the same performance on the number of panicles per tiller. The coefficient of variance is 15%.

Column 3 of Table 11 shows the no. of grains per panicle of rice varieties. Analysis of variance shows no significant difference among treatment means. This implies that both varieties have the same performance as to the number of grains per panicle. The coefficient of variance is 31%.

Column 4 of Table 3 shows the yield of rice varieties. Analysis of variance shows no significant difference among treatment means. This implies that both varieties have the same performance in terms of yield. The coefficient of variance is 8%.

Column 5 of Table 11 shows the weight of 1000 seeds of rice varieties. Analysis of variance shows a highly significant difference among treatment means. V2 (red rice) got the highest mean of 36.3 grams while V1 (black rice) has a mean of 33 grams. This implies that the red rice variety has a better performance as to the weight of 1000 seeds. The coefficient of variance is 14%.

Column 6 of Table 11 shows the weight of rice biomass (kg) of the rice varieties. Analysis of variance shows no significant difference among treatment means. This implies that both varieties have the same performance in terms of rice biomass (kg). The coefficient of variance is 13%.

Table 11. Yield performance of (Mainplot) rice varieties in terms of the no. of panicles per tiller, no. of grains per panicle, yield per treatment (kgs), 1000 seed wt. (grams), and rice biomass (kg).

Mainplot (Rice Varieties)	Panicle	Grains	Yield	1000 seeds	Biomass
V1 (Black rice)	49.1	571.4	2.9	33.0b	2.5
V2 (Red rice)	53.1	567.7	3.1	36.3a	2.8
f-test	Ns	ns	ns	**	ns
cv%	15%	31%	8%	14%	13%

Table 12 shows the yield performance of rice treated with levels of bokashi (Subplot) in terms of the no. of panicle per tiller, no. of grains per panicle, yield per treatment (kgs), 1000 seed wt. (grams), and rice biomass (kg). Column 2 presents the no. of panicles per tiller of rice. Treatment E (Negative Control-Synthetic Fertilizer) has the highest mean of 57.7, followed by treatment A (Positive Control-Commercial Organic Fertilizer), then treatment B (5 tons of Bokashi/ha) with a mean of 53, treatment D (15 tons of Bokashi/ha) with a mean of 47.4, and treatment C (10 tons of Bokashi/ha) got the lowest mean of 40.

Analysis of variance shows a highly significant difference among treatment means. This implies that treatments A (Positive Control-Commercial Organic Fertilizer), B (5 tons of Bokashi/ha), and E (Negative Control-Synthetic Fertilizer) have the same performance among other treatments. The coefficient of variance is 17%.

Column 3 of Table 12 shows the no. of grains per panicle of rice treated with levels of bokashi. Analysis of variance shows no significant difference among treatment means. This implies that all treatments have the same performance as to the no. of grains per panicle. The coefficient of variance is 25%.

Column 4 of Table 12 shows the yield of rice treated with levels of bokashi. Analysis of variance shows no significant difference among treatment means. This implies that all treatments have the same performance in terms of yield. The coefficient of variance is 14%.

Column 5 of Table 12 shows the weight of 1000 seeds of rice treated with levels of bokashi. Analysis of variance shows no significant difference among treatment means. This implies that all treatments have the same performance as to the weight of 1000 seeds. The coefficient of variance is 7%.

Column 6 of Table 12 shows the weight of rice biomass (kg) as treated with levels of bokashi. Analysis of variance shows no significant difference among treatment means. This implies that all treatments have the same performance in terms of rice biomass (kg). The coefficient of variance is 17%.

Table 12. Yield performance of rice in Subplot (levels of bokashi) in terms of the no. of panicles per tiller, no. of grains per panicle, yield per treatment (kgs), 1000 seed wt. (grams), and rice biomass (kg).

Subplot (Levels of Bokashi)	Panicle	Grains	Yield	1000 seeds	Biomass
A - Positive Control (Commercial Organic Fertilizer)	57.3a	655.3	2.7	33.0	2.5
B - 5 tons of Bokashi/ha	53.0a	515.2	2.8	35.2	2.6
C - 10 tons of Bokashi /ha	40.0c	454.8	2.9	35.2	2.7
D - 15 tons of Bokashi/ha	47.4b	558.0	3.1	34.2	2.8
E - Negative Control (Synthetic Fertilizer)	57.7a	664.4	3.3	35.7	2.9
f-test	**	ns	ns	ns	ns
cv%	17%	25%	14%	7%	17%

Table 13 shows the treatment interactions of Mainplot and 2 as to the yield performance of rice in terms of the no. of panicles per tiller, no. of grains per panicle, yield per treatment (kgs), 1000 seed wt. (grams), and rice biomass (kg).

Column 2 of Table 13 presents the interaction of treatments as to the no. of panicles. Analysis of variance shows no significant difference among treatment means. This implies that all treatments have the same performance. The coefficient of variance is 17%.

Column 3 of Table 13 shows the interaction of treatments as to the no. of grains per panicle. Analysis of variance shows no significant difference among treatment means. This implies that all treatments have the same performance as to the no. of grains per panicle. The coefficient of variance is 25%.

Column 4 of Table 13 shows the interaction of treatments as to yield. Analysis of variance shows no significant difference among treatment means. This implies that all treatments have the same performance in terms of yield. The coefficient of variance is 14%.

Column 5 of Table 3.12 shows the interaction of treatments as to the weight of 1000 seeds. Analysis of variance shows no significant difference among treatment means. This implies that all treatments have the same performance as to the weight of 1000 seeds. The coefficient of variance is 7%.

Column 6 of Table 13 shows the interaction of treatments as to the weight of rice biomass (kg. Analysis of variance shows no significant difference among treatment means. This implies that all treatments have the same performance in terms of rice biomass (kg). The coefficient of variance is 17%.

Table 13. Treatment interactions of Mainplot and Subplot as to the yield performance of rice in terms of the no. of panicles per tiller, no. of grains per panicle, yield per treatment (kgs), 1000 seed wt. (grams), and rice biomass (kg).

Main plot* subplot	Panicle	Grains	Yield	1000 Seeds	Biomass
1A1 – Black rice * Positive Control (Commercial Organic Fertilizer)	56.7	635.9	2.5	31.7	2.2
*V1B1 - Black rice * 5 tons of Bokashi/ha	49.0	517.8	2.7	32.7	2.6

V1C1 - Black rice * 10 tons of Bokashi/ha	39.0	496.8	2.9	33.3	2.6
V1D1 - Black rice * 15 tons of Bokashi/ha	43.7	544.2	3.0	33.0	2.5
V1E1 - Black rice * Negative Control (Synthetic Fertilizer)	57.0	662.2	3.4	34.3	2.8
V2A2 – Red rice * Positive Control (Commercial Organic Fertilizer)	57.9	674.7	2.9	34.3	2.7
V2B2 – Red rice * 5 tons of Bokashi/ha	57.0	512.6	3.0	37.7	2.6
V2C2 – Red rice * 10 tons of Bokashi/ha	41.0	412.8	3.0	37.0	2.8
V2D2 – Red rice * 15 tons of Bokashi/ha	51.1	571.8	3.2	35.3	3.1
V2E2 – Red rice * Negative Control (Synthetic Fertilizer)	58.4	666.6	3.2	37.0	2.9
f-test	ns	ns	ns	ns	ns
cv%	17%	25%	14%	7%	17%

CONCLUSION

As to the growth performance of Variety 1, there were significant differences in the no. of tillers and leaves, while Variety 2 was on plant height. As to the yield performance, a significant effect was observed in the weight of 1000 seeds (grams) of Variety 2. There is a significant difference in the number of tillers applied with treatment C (10 tons of Bokashi/ha). On the yield performance, treatment B (5 tons of Bokashi/ha) has a significant effect on the no. of panicle per tiller. Rice varieties and bokashi application interacted only on the number of tillers on the 30th day after transplanting, as supported by a significant difference.

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REFERENCES

Anies, et.al. (2014). Traditional upland rice varieties in Mindanao [Philippines] with excellent quality and high antioxidant properties. http://www.uplb.edu.ph.

R.E.A.P. Canada. (2018). Bokashi Organic Fertilizer. https://www.reap-canada.com. http://www.uplb.edu.ph http://www.uplb.edu.ph http://www.uplb.edu.ph

CGIAR, (2018). The global staple. http://ricepedia.org/rice-as-food/the-global-staple-rice-consumers

Samson et.al. (2006). The Philippine Sustainable Seed and Agriculture Development Project. Resource Efficient Agricultural Production (REAP)-Canada Box 125 Centennial Centre CCB13

Sainte Anne de Bellevue, Quebec, H9X 3V9. https://www.researchgate.net/publication/310606812

Taguiling, M. G. (2013). Quality improvement of organic compost using green biomass. Ifugao State University Ifugao, Philippines European Scientific Journal, 9(36).

Orihuela, O. (2017). Bokashi Organic Fertilizer. https://www.fincafina.ec/single-post/2017/09/19/Bokashi-Organic-fertilizaer

ACCEPTABILITY LEVEL OF BANANA MUFFIN WITH MANGO JAM FILLING

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ABSTRACT The general objective of this study was to determine the level of acceptability of Banana Muffin with Mango Jam Filling in terms of color, aroma, taste, texture, palatability, appearance, and mouthfeel. As of today, there were a lot of pastry products that have been introduced to us. However, some of them were expensive; some people could not afford to buy one to develop a new bread product and determine its acceptability level. In the conduct of this study, the researchers used the convenience sampling technique. There were thirty (30) pieces of Banana Muffin with Mango Jam Filling for thirty (30) respondents. This study used the indirect method of collecting data. This was done using the survey instrument given to the thirty (30) respondent, which included the faculty, staff, and students who were available for the conduct of the assessment. Mean and standard deviation were used as statistical tools for data analysis and decision–making to determine the acceptability level of the bread product. The findings of this study revealed that Banana Muffin with Mango Jam Filling was highly acceptable in terms of color (Mean=4.60, SD=0.62), aroma (Mean=4.60,SD=0.67), taste (Mean=4.77, SD=0.43), texture (Mean=4.47, SD=0.51), palatability (Mean=4.77, SD=0.50), appearance (Mean=4.80, SD=0.41), and mouthfeel (Mean=4.87, SD=0.35). Therefore, Banana Muffin with Mango Jam Filling was highly acceptable as a bread product. This meant that banana muffin added with mango jam as its filling produced a highly satisfying color, aroma, taste, texture, palatability, appearance, and mouthfeel.
Keywords: *banana muffin, filling, level of acceptability*

INTRODUCTION

Background of the Study

The name "muffin" either comes from the German word "muffe" or the French word "moufflet," meaning soft bread. Muffins are called quick bread because they contain no yeast. According to Baking Industry Research Trust, muffins are small cup cake-like baked products, more elastic and less tender than cupcakes. They have bell-shaped tops, can be sweet or savory, and are leavened with baking powder or soda. A muffin's shape should have a uniform, well-rounded top, free from peaks, with no cracks, and be large in proportion to weight. The outside color should be an even golden brown and be tender, with a pebbly or slightly rough and shiny surface. The inside texture should be moist, tender, and light with an even, round-holed grain. The inside color should be creamy white or slightly yellow and free from streaks. Muffins may vary by adding fruits, nuts, herbs, cheese, chopped meats, or spices to the batter. Muffins are high in complex carbohydrates and B vitamins and are often a good source of fiber if they contain bran, fruits, and vegetables or are made with whole wheat flour.
(Retrieved from http://www.ndwheat.com/uploads/resources/412/muffins.pdf on December 10, 2017).

This study aimed to develop high-quality bread from banana and mango. Banana is one of the favorite fruits of Filipinos. Likewise, mango is well-known in Guimaras. Hence, the researchers developed and determined the acceptability level of banana muffin with mango jam filling to further validate the findings of this study.

Objective of the Problem

Generally, this study aimed to determine the acceptability level of banana muffin with mango jam filling in terms of color, aroma, taste, texture, palatability, appearance, and mouthfeel.

METHODOLOGY

The developmental research design was used in this study employing a survey instrument. It was administered using a research instrument and provided textual descriptions from the evaluated final product of banana muffin with mango jam filling. Developmental research had been defined as the systematic study of designing, developing, and evaluating instructional programs, processes, and products that should meet the criteria of internal consistency and effectiveness. It involved situations in which the product-development process was analyzed and described, and the final product was evaluated. Research instruments were given to the respondents of this study composed of thirty (30) faculty, staff, and students at Guimaras State College, Mclain, Buenavista, Guimaras who were requested to assess the acceptability level of banana muffin with mango jam filling in term of its color, aroma, taste, texture, palatability, appearance and mouthfeel using the 9-point hedonic scale. The respondents were chosen using convenience sampling. This sampling technique was a type of non-probability sampling in which people were sampled simply because they were convenient sources of data for researchers. Data were gathered using a research survey instrument. The validity of the research instrument of this study was established utilizing the expertise of three validators who assessed the bread product. The experts each reviewed the survey instrument and scored it according to its color, aroma, taste, texture, palatability, appearance, and mouth feel of banana muffin with mango jam filling. The scoring index was measured from 1 (poor) to 5 (excellent). Cronbach's alpha was used in this study to test the internal consistency, which was, how closely related a set of items was as a group. It was considered to be a measure of scale reliability.

When the research instrument was pilot tested, the reliability was computed using the Statistical Package for the Social Sciences (SPSS, Version 17) with Cronbach's alpha of 0.960. This meant very high reliability since it was greater than 0.70

Materials Used in Preparing Banana Muffin with Mango Jam Filling

The materials used in preparing Banana Muffin with Mango Jam Filling were the following:

Medium sized bowl	Oven	Cups	Teaspoons
Small bowl	Quart Pot	Masher	Stove
Muffin tins	Knife	Tablespoons	Pastry bag

Ingredients in Preparing Banana Muffin

The ingredients needed in preparing banana muffin were the following:

3 ½ cups of Whole Wheat Flour	3 pieces of eggs
3 teaspoons of Baking Powder	1 ½ cups of white sugar
3 teaspoons of Baking Soda	1 ½ teaspoons of salt
1 cup of melted butter	9 fingers of bananas (Saba

Directions in Preparing Banana Muffin

First, preheat the oven to 350 °F. Then, peel the fingers of bananas and mash them in the medium sized bowl. Add the melted butter, egg, and sugar, then mix well. In a separate bowl, combine the flour, baking powder, baking soda, and salt. Pour the flour mixture into the banana mixture, and mix well. Spoon mixture into muffin tins by filling the tins 3/4 full. Bake in the oven for 15 minutes or until golden brown

Ingredients in Preparing Mango Jam

The ingredients needed in preparing mango jam were the following:

2 cups of ripe mango	¼ teaspoon of butter
1 tablespoon of lemon juice	1 pouch of pectin
2-3 cups of white sugar	

Directions in Preparing Mango Jam

First, peel and pit mangoes. Measure exactly at 2 cups, and put it into a 2 or 4-quart pot. Second, grind or crush the fruit with a potato masher. Stir in lemon juice. Then, place the mixture on the stove and cook over medium heat, stirring regularly. After about 4 to 5 minutes, add sugar and butter to the pot. Bring mixture to a full rolling boil on high heat, while stirring constantly. Stir in pectin. Return to a full rolling boil, and boil for one minute, and stir constantly. Remove from the heat. Skim off any foam with a spoon. Ladle immediately into the storage container.

Procedures in Preparing Banana Muffin with Mango Jam Filling

The following steps in preparing the Banana Muffin with Mango Jam Filling were:
Step 1: Prepare all the ingredients and materials.
Step 2: Start with the muffin first.
Step 3: Then, work with the fillings.
Step 4: Fill a pastry bag with a small tip. Push tip through the bottom of the paper liner to fill each muffin.
Step 5: And lastly, make it more attractive and then serve.

In this study, when pieces of banana muffin with mango jam filling were prepared, the researchers provided the respondents with a research instrument to assess and evaluate the bread product. The respondents were given five (5) to do it. This study used the survey instrument in collecting data given to the thirty (30) respondents which includes the faculty, staff, and students in order to assess the acceptability level of banana muffin with mango jam filling. The respondents filled out the survey instrument to assess the level of acceptability of banana muffin with mango jam filling with the following indicators: color, aroma, taste, texture, palatability, appearance, and mouth feel. Results of the assessment were collected, organized, encoded, and interpreted into the data sheet and computed using the Statistical Package for the Social Science (SPSS, version 17) for data analysis. In this study, means and standard deviations were used to determine the acceptability level of the banana muffin with mango jam filling.

RESULTS AND DISCUSSION

Level of Acceptability of the Banana Muffin with Mango Jam Filling

Table 1 shows the acceptability level of Banana Muffin with Mango Jam Filling. Results revealed that Banana Muffin with Mango Jam Filling was highly acceptable in terms of color (Mean= 4.60, SD= 0.62), aroma (Mean= 4.60, SD= 0.67), taste (Mean= 4.77, SD= 0.43), texture (Mean= 4.47, SD= 0.51), palatability (Mean= 4.77, SD= 0.50), appearance (Mean= 4.80, SD= 0.41), and mouth feel (Mean= 4.87, SD= 0.35). This meant that Banana Muffin with Mango Jam Filling was a highly acceptable bread product with an overall mean of 4.70 and a standard deviation of 0.50. This also meant that Banana Muffin with Mango Jam Filing produced a highly satisfying color, aroma, taste, texture, palatability, appearance and mouth feel as a bread product.

This supports and conforms to the study of Ararilla,et.al. (2015), that the acceptability level of Native Banana Muffin was highly acceptable in terms of its color, aroma, taste, texture, palatability, appearance, and mouth feel. This meant that Native Banana Muffin was a highly acceptable bread product.

This also supports the study of Katie Cunningham, et al. (2016) on Apple Cinnamon Muffins with Flour Substitutes that increase and alter the fiber content in muffins without reducing the appeal of taste or texture negatively. The increasing amount of gastrointestinal issues because of not consuming enough fiber was the drive for this experiment. All muffins will be gluten-free and the control will be 100% all-purpose gluten-free flour. Three experiments will be conducted. The first will compare the control muffin to a muffin containing half oat bran and half gluten free flour. The second experiment compares the control muffin to a muffin with more than half coconut flour but less than half gluten-free flour. The last experiment compares the control muffin to a muffin made of half flaxseed meal and half gluten-free flour. Sensory evaluations were conducted using a 5-point hedonic scale to measure the acceptability of overall acceptability, texture, moisture, and flavor. A three-point hedonic scale measures the overall acceptability of appearance. Objective evaluations were recorded by using a Vulcan to measure weight, volume, and height. It was determined that the oat bran substitution muffin was the most liked overall, with the control muffin being a close second. The coconut flour muffins were the least overall liked based on appearance and control muffins were most liked based on appearance. The control muffins were liked overall based on the texture. The most liked sample based on flavor is oat bran with the control muffin following closely. The flaxseed meal muffins were most liked overall based on moisture.

Table 1. Acceptability Level of Banana Muffin with Mango Jam Filling

Indicators	N	Mean	Standard Deviation	Interpretation
Color	30	4.60	0.62	Highly Acceptable
Aroma	30	4.60	0.67	Highly Acceptable
Taste	30	4.77	0.43	Highly Acceptable
Texture	30	4.47	0.51	Highly Acceptable
Palatability	30	4.77	0.50	Highly Acceptable
Appearance	30	4.80	0.41	Highly Acceptable
Mouth feel	30	4.87	0.35	Highly Acceptable
Over-all	30	4.70	0.50	Highly Acceptable

Scale: 1.00-1.80, Not Acceptable; 1.81-2.60, Fairly Acceptable; 2.61-3.40, Acceptable; 3.41—4.20, Very Acceptable; 4.21-5.00, Highly Acceptable

CONCLUSIONS

The banana muffin added with mango jam as its filling produced a highly satisfying color, aroma, taste, texture, palatability, appearance, and mouthfeel. Therefore, Banana Muffin with Mango Jam Filling was highly acceptable as a bread product.

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REFERENCES

Abdelazim A., Nour, M., Khalid, S. M., & Gammaa A., M. O. (2014). Suitability of Some Sudanese Mango Varieties for Jam Making.

Alarilla, W. ,et al. (2015).acceptability level of native banana muffin. Unpublished Thesis. Guimaras State College.

Basu, S. & Shivhare , U. S.(2012). Rheological, Textural, Microstructural, and Sensory Properties of Sorbitol-Substituted Mango Jam.

Bordi, P. L.,et.al. (2006). Acceptability of soy protein in oatmeal muffins.

Busch, S. (2018). What are the benefits of banana nut muffins. SFGATE. http://healthyeating.sfgate. com/benefits-banana-nut-muffins-3578.html

Butler, N. (2019). What to know about mangoes. Medical News Today. https://www.medicalnewstoday.com/articles/275921.php

Cunningham, K., et al. (2016). The Acceptability of Apple Cinnamon Muffins with Flour Substitutes .

Javanmard, M., Chin, N.L., Yusof, Y. A. & Endan, J. Effect of Composition on Rheological Properties of Mango Jam Prepared With Sago Starch. Retrieved February 18, 2018.

Kumar, K.P.S., Bhowmik,D., Duraivel, S., & Umadevi, M. (2012). Pharmacognosy and Phytochemistry Traditional and Medicinal Uses of Banana. http://www.phytojournal.com/vol1Issue3/Issue_sept_2012/9.1.pdf

Lauricella , M., Emanuele, S., Calvaruso, G., Giuliano, M., & D'Anneo, A.(2017). Multifaceted health benefits of mangifera indical.(mango):The inestimable value of orchards recently planted in sicilian rural areas.

Li, Y. (2016).How to determine the validity and reliability of an instrument. https://blogs.miamioh.edu/discovery-center/2016/11/how-to-determine-the-validity-and-reliability-of-an-instrument/

Luciano, R.G., Alcantara, G.M., & Bauat, R. (2020). Design and Development of Alumni Tracking System for Public and Private HEIs. International Journal of Scientific and Technology Research, 9 (6). https://www.ijstr.org/final-print/jun2020/Design-And-Development-Of-Alumni-Tracking-System-For-Public-And-PrivateHeis.pdf

Ramcharitar, Anisa et. al. (2006). Consumer Acceptability of Muffins with Flaxseed
Wheat Foods Council (2008). Grains of truth about muffins. https://dstendahlculinaryarts1.weebly.com/uploads/2/2/7/6/22764148/muffins.pdf

North Dakota Wheat Commission. http://www.ndwheat.com/uploads/resources/412/muffins.pdf

Healthy Food House (2019). Throw the medications in the trash: This fruit heals better than any other medication. http://www.healthyfoodhouse.com/throw-the-medications-in-the-trash-this-fruit-heals-better-than-any-other-medication/
http://www.worldwatch.org/system/files/LCBananas.pdf

http://foodieguy.in/adios-mangoes/
https://www.care2.com/greenliving/10-health-benefits-of-mangos.html
https://www.dunkindonuts.com/en/food-drinks/bakery-snacks/muffins
https://www.oxforddictionaries.com/
http://www.cof14thcvi.com/Readings/The_Theory_and_Art_of_Bread_Making__E_N_Horsford.pdf
www.mango.org

GROWTH OF CLONED DAO (DRACONTOMELON DAO (L.) BLUME) AS AFFECTED BY DIFFERENT MIXTURES OF POTTING MEDIA AND LEVELS OF MYCORRHIZAL INOCULANT

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ABSTRACT This study was conducted inside the grown-out area of the Clonal Nursery Complex of the GSC Baterna Campus, San Lorenzo, Guimaras in January-February, 2019. This study aims to determine the growth of cloned dao seedlings as affected by different mixtures of potting media and evaluate the growth of cloned dao seedlings as affected by the different levels of mycorrhizal inoculant. A factorial experiment on a Completely Randomized Design (F-CRD) was used in this study. Factor A represented different mixtures of potting media: A1-Negative Control (Pure Garden Soil), A2- Positive Control (Pure Vermicompost), A3-50% garden soil + 50% vermin compost, and A4-75% garden soil + 25% vermicompost. Factor B represented the levels of mycorrhizal inoculant per pot: B1- Control, B2- 14 grams mycorrhiza/pot and B3-28 grams mycorrhizal/pot. There were twelve (12) treatment combinations replicated four (4) times, making a total of forty-eight (48) variates. Each variate had ten (10) cloned dao seedlings as experimental plants. The parameters used in this study were the following: plant height, number of leaves, length of leaves, width of leaves, number of branches, survival rate, and number of days to reach the plantable height (1 foot). Results show that the different mixtures of potting media and different levels of mycorrhizal inoculant have a highly significant effect on the growth of cloned dao seedlings in terms of plant height and number of days to reach the plantable height (1 foot). The researchers recommend using combination of 75% garden soil + 25% vermicompost with 28 grams mycorrhizal/pot which can hasten the number of days to reach the plantable height (1 foot) of dao seedlings.

Keywords: *dao, growth evaluation, mycorrhizal, soil media mixtures*

INTRODUCTION

In the Philippines, the municipality of Dao, Capiz and barangay of Dau in Mabalacat, Pampanga are named after the dao tree. Revered and called "Five Buddhas" in Thailand and Laos because of the intricate pattern of approximate five-fold symmetry on the seed surface and its rhombic protrusions that reminds of the primitive Buddha image.
Dao is a large tree, growing 30 meters or taller, with the trunk 1 meter or more in diameter. Leaves are alternate and pinnately compound. Leaflets are smooth, oblong, 5 to 7 pairs, up to 15 centimeters long, and 4 centimeters wide, pointed at the apex, and abruptly tapered at the base. Flowers are small, white, and fragrant, hanging in lax panicles. Fruit is globose, green turning yellow when ripe with oval markings on the upper side of the fruit, about 2 to 3 centimeters in diameter (Stuart, 2016).
Vermicompost improves soil texture and enhances the water-holding capacity of the soil. It may be low in NPK but contains essential nutrients (e.g. calcium, magnesium, manganese, copper, iron, and zinc) not found in inorganic fertilizers. Moreover, it has microbial activities that promote plant health and pest/disease resistance (Department of Agriculture, 2016).
Mycorrhizal not only enhances a plant's uptake of water even in arid or acidic soils but also releases powerful enzymes into the soil that dissolve hard-to-capture nutrients such as organic nitrogen, phosphorus, iron, and other "tightly bound" soil nutrients. Mycorrhizal fungus possesses symbiotic ties with plants. It attaches itself either on or inside the plant roots to tap into the sugars and carbohydrates present in the leaves for its sustenance. In turn, the fungal hyphae (filaments) grow out from the roots and bring water and soil nutrients back into the plant host (Que, 2016).
The nutrient problem is one of the reasons for the lower survivability of the newly potted clones. There should be readily available nutrients in the media for the young roots to absorb to boost their growth and to have a short recovery period.

Objectives of the Study

This study was conducted to (1) determine the growth of cloned dao seedlings as affected by different mixtures of potting media as to their: plant height, number of leaves, length of leaves, width of leaves, number of branches, survival rate, and number of days to reach the plantable height (1 foot), (2) evaluate the growth of cloned dao seedlings as affected with different levels of mycorrhizal inoculant as to their: plant height, number of leaves, length of leaves, width of leaves, number of branches, survival rate and number of days to reach the plantable height (1 foot), (3) know the significant difference of different mixtures of potting media to the growth of cloned dao seedlings, (4) determine the significant difference of different levels of mycorrhizal inoculant to the growth of cloned dao seedlings, and (5) to know the interaction effect of different mixtures of potting media and different levels of mycorrhizal inoculant to the growth of cloned dao seedlings.

METHODOLOGY

This study was conducted inside the grown-out area of the Clonal Nursery Complex of the GSC Baterna campus, San Lorenzo, Guimaras in January-February, 2019. Experimental design, treatments, and replication were utilized in the study. A factorial experiment on a Completely Randomized Design (F-CRD) was used in this study. Factor A represented different mixtures of potting media: A1- Negative Control (Pure Garden Soil), A2- Positive Control (Pure Vermicompost), A3- 50% garden soil + 50% vermin compost, and A4-75% garden soil + 25% vermicompost. Factor B represented the levels of mycorrhizal inoculant per pot: B1- Control, B2- 14 grams mycorrhizal/pot, and B3-28 grams mycorrhizal/pot. There were twelve (12) treatment combinations replicated four (4) times making a total of forty-eight (48) variates. Each variate had ten (10) cloned dao seedlings as experimental plants.

Table 1. Treatment combinations

Factor A (Mixtures of Potting Media)	B1	Factor B (levels of mycorrhizal B2	B3
A1	A1B1	A1B2	A1B3
A2	A2B1	A2B2	A2B3
A3	A3B1	A3B2	A3B3
A4	A4B1	A4B2	A4B3

Table 2. Experimental Layout

A2BI	A1B2	A1B3	A1B1
A3B1	A2B1	A2B1	A1B2
A4B2	A3B3	A4B3	A2B1
A1B1	A4B2	A4B3	A2B3
A4B1	A4B3	A1B1	A1B3
A3B2	A1B2	A1B3	A4B1
A2B2	A3B2	A3B3	A3B2
A4B2	A3B3	A2B3	A4B1
A3B1	A2B2	A2B3	A2B2
A3B2	A3B3	A4B2	A2B3
A1B1	A2B3	A3B1	A4BI
A2B2	A1B2	A4B2	A3BI

Legend: Factor A (Mixtures of the Potting Media)
A1- Negative Control (Pure Garden Soil)
A2- Positive Control (Pure Vermicompost)
A3- 50% garden soil + 50% Vermicompost
A4- 75% garden soil + 25% Vermicompost

Factor B (Levels of Mycorrhizal)
B1- Control
B2- 14 grams Mycorrhizal/pot
B3-28 grams Mychorrhizal/pot

Collection of Potting Media. The potting media was a combination of garden soil and vermicompost that were collected in the production area of the GSC Baterna Campus.
Source and collection of Planting Materials. Newly rooted ramets was collected from the rooting chambers of the nursery. Ramets with good root development and shoots were selected for the study. Seedlings were carefully uprooted to avoid root damage. They were directly placed inside a plastic pale with water to avoid transplant shock and were brought to the potting area.
Potting and Planting. Potting media was a combination of garden soil and vermicompost. After the collection, potting media was sieved to have a finer particle and to take away the debris and other biological remains. Before mixing and potting, it was disinfected by placing the media inside a wok over the fire to eliminate the fungi and other pathogens that may cause infection to the clones.

Disinfected media was mixed and was placed inside a plastic pot (polyethylene). The plastic was filled with potting media before applying the mycorrhizal. The rooted cuttings were placed at the top of inoculants and it was filled again with potting media. They were arranged according to experimental layouts in the elevated beds.
Water Management. Cloned seedlings were watered twice daily with installed overhead sprinklers inside a screen house.
Pest Management. To prevent pest infestation, the screen house was closed for the entire period of the study. The biosecurity procedure was strictly observed.

The following data were gathered to evaluate the growth of cloned dao as affected by different mixtures of potting media and levels of mycorrhizal inoculant: plant height, number of leaves, length of leaves, width of leaves, number of branches, survival rate, and number of days to reach the plantable height (1 foot). Data gathering was conducted every seven (7) days. All the data were analyzed using two (2) ways Analysis of variance (ANOVA). Significant means were tested using Duncan's Multiple Range Test (DMRT).

RESULTS AND DISCUSSION

Plant height

Table 3 presents the summary of means of plant height, number of leaves, length of leaves, width of leaves, number of branches, survival rate, and number of days to reach the plantable height (1 foot). The second column of Table 3 shows the plant height of dao. For factor 1 (mixtures of potting media), the highest mean was obtained by treatment A3 (50% garden soil + 50% vermicompost), which is 37.3 cm. Analysis of variance shows a highly significant effect among treatment means of factor 1. It shows that the use of different mixtures of potting media has a highly significant effect compared to pure garden soil. This implies that the use of 50% garden soil + 50% vermicompost can increase the height of dao seedlings.
For factor 2 (Levels of Mycorrhizal), the highest mean was obtained by treatment B3 (28 grams mycorrhizal/pot), which has 35.4 cm. Analysis of variance shows a highly significant effect among treatment means of factor 2. It shows that the levels of mycorrhizal have a highly significant effect on the growth of dao seedlings, specifically on its height. This implies that the use of 28 grams of mycorrhizal/pot can increase the height of dao seedlings.

Table 3. Summary of means on plant height, number of leaves, length of leaves, width of leaves, number of branches, survival rate, and number of days to reach the plantable height (1 foot).

Treatment	Plant height	Number of leaves	Length of leaves	Width of leaves	Number of branches	Survival rate	Number of days to reach the plantable height (1 foot)
Factor 1							
A1	32.7c	9	11.25	6.58	4	1.00	39.0a
A2	35.8b	9	12.17	6.92	3	1.00	32.8c
A3	37.3a	9	12.80	7.17	4	1.00	35.4b
A4	34.0b	10	12.08	7.08	4	1.00	37.7b
f-test	**	ns	ns	ns	ns	ns	**
Factor 2							
B1	34.4b	9	11.75	7.00	4	1.00	36.9a
B2	35.0ab	10	12.06	6.75	4	1.00	36.3ab
B3	35.4a	10	11.94	7.06	4	1.00	35.4b
f-test	**	ns	ns	ns	ns	ns	**
cv%	1%	19%	8%	11%	12%	N/A	1%

For the combination of treatments (Table 3.1), analysis of variance showed a highly significant effect on the plant height of dao. This implies that the use of 50% garden soil + 50% vermicompost with a higher amount of mycorrhizal has a highly significant effect on the plant height of dao seedlings. The coefficient of variance is 1%.

Table 3.1. Two-way table on plant height of dao at different mixtures of potting media and levels of mycorrhizal.

Levels of Mycorrhizal					
Mixtures of the Potting Media	B1	B2	B3	Total	Mean
A1	32.0	33.0	33.0	98	32.66
A2	35.0	36.0	36.5	107.5	35.83
A3	37.0	37.0	37.8	111.8	37.26
A4	33.8	34.0	34.3	102.1	34.03
Total	137.8	140	141.6	419.4	
Mean					139.78
f-test	**				
cv%	1%				

Number of leaves

The third column of Table 3.2 shows the number of leaves of dao seedlings. For factor 1 (mixtures of potting media), the highest mean which is 10 was obtained by treatment A4 (75% garden soil + 25% vermicompost). Analysis of variance showed no significant effect among treatment means of factor 1. It shows that the use of different mixtures of potting media has the same effect on the number of leavesW

For factor 2 (Levels of Mycorrhizal), the highest mean which is 10 was obtained by treatments B2 (14 grams mycorrhizal/pot) and B3 (28 grams mycorrhizal/pot). Analysis of variance showed no significant effect among treatment means of factor 2. It shows that the levels of mycorrhizal has the same effect on the growth of dao seedlings, specifically on the number of leaves.

For the combination of treatments (Table 3.2), analysis of variance shows no significant effect on the number of leaves of dao. This implies that different mixtures of potting media and levels of mycorrhizal have the same effect on the growth of dao seedlings, specifically on the number of leaves. The coefficient of variance is 19

Table 3.2. Two-way table on the number of leaves of dao at different mixtures of potting media and levels of mycorrhizal.

Levels of Mycorrhizal					
Mixtures of the Potting Media	B1	B2	B3	Total	Mean
A1	8.8	8.3	8.5	25.6	8.53
A2	10.5	8.5	10.0	29.0	
A3	9.0	9.3	11.0	29.3	9.66
A4	9.3	8.3	9.0	26.6	9.76
Total	37.6	34.4	38.5	110.5	8.86
Mean			v		
f-test	NS				36.81
cv%	19%				

Length of leaves

The fourth column of Table 3.3 shows the length of leaves of dao seedlings. For factor 1 (mixtures of potting media), the highest mean which is 12.80 cm was obtained by treatment A3 (50% garden soil + 50% vermicompost) and treatment A1- Negative Control (Pure Garden Soil) got the lowest mean of 11.25 cm. Analysis of variance showed no significant effect among treatment means of factor 1. It shows that the use of different mixtures of potting media have the same effect on the length of leaves.

For factor 2 (Levels of Mycorrhizal), the highest mean which is 12.06 cm was obtained by treatment B2 (14 grams mycorrhizal/pot). Analysis of variance showed no significant effect among treatment means of factor 2. It shows that the levels of mycorrhizal have the same effect on the growth of dao seedlings specifically on the length of leaves.

For the treatment combinations (Table 3.3), analysis of variance shows no significant effect on the length of leaves of dao. This implies that different mixtures of potting media and levels of mycorrhizal have the same effect on the length of leaves. The coefficient of variance is 8 %.

Table 3.3. Two-way table on the length of leaves of dao at different mixtures of potting media and levels of my-

Levels of Mycorrhizal				
Mixtures of the Potting Media	B1	B2	B3	Total
A1	11.8	12.5	12.0	36.3
A2	12.5	11.8	12.3	36.6
A3	11.0	11.5	11.3	33.8
A4	11.8	12.5	12.3	36.6
Total				143.3
Mean				
f-test	NS			
cv%	8%			

Width of Leaves

The fifth column of Table 3.4 shows the width of the leaves of dao seedlings. For factor 1 (mixtures of potting media), the highest mean which is 7.17 cm was obtained by treatment A3 (50% garden soil + 50% vermicompost) and treatment A1 (Negative Control-Pure Garden Soil) got the lowest mean of 6.58 cm. Analysis of variance showed no significant effect among treatment means of factor 1. It shows that the use of different mixtures of potting media has the same effect on the length of leaves.

For factor 2 (Levels of Mycorrhizal), the highest mean which is 7.06 cm was obtained by treatment B3 (28 grams mycorrhizal/pot) and treatment B2 (14 grams mycorrhizal/pot) got the lowest mean of 6.75 cm. Analysis of variance shows no significant effect among treatment means of factor 2. It shows that the levels of mycorrhizal have the same effect on the growth of dao seedlings specifically on the width of leaves.

For the treatment combinations (Table 3.4), analysis of variance shows no significant effect on the width of leaves of dao. This implies that different mixtures of potting media and levels of mycorrhizal have the same effect on the growth of dao seedlings, specifically on the width of leaves. The coefficient of variance is 11 %.

Table 3.4. Two-way table on the width of leaves of dao at different mixtures of potting media and levels of mycorrhizal.

Levels of Mycorrhizal					
Mixtures of the Potting	B1	B2	B3	Total	Mean
Media	7.3	6.3	6.5	20.1	6.7
A1	6.5	7.3	7.5	21.3	7.1
A2	7.0	7.0	7.3	21.3	7.1
A3	7.3	6.5	7.0	20.8	6.93
A4				83.5	
Total					27.83
Mean	NS				
f-test	11%				
cv%					

Number of branches

The sixth column of Table 3.5 shows the number of leaves of dao seedlings. For factor 1 (mixtures of potting media), the highest mean which is 4 was obtained by treatment A1 (Negative Control-Pure Garden Soil), treatment A3 (50% garden soil + 50% vermicompost), and treatment A4 (75% garden soil + 25% vermicompost). Treatment A2 (Positive Control-Pure Vermicompost) got the lowest mean which is 3. Analysis of variance showed no significant effect among treatment means of factor 1. It shows that the use of different mixtures of potting media has the same effect on the number of branches.

For factor 2 (Levels of Mycorrhizal), all treatments got the same mean which is 4 in terms of the number of branches. Analysis of variance shows no significant effect among treatment means of factor 2. It shows that the levels of mycorrhizal have the same effect on the growth of dao seedlings specifically on the number of branches.

For the treatment combinations (Table 3.5), analysis of variance shows no significant effect on the number of branches of dao. This implies that different mixtures of potting media and levels of mycorrhizal have the same effect on the growth of dao seedlings specifically on the width of leaves. The coefficient of variance is 12 %.

Table 3.5. Two-way table on the number of branches of dao at different mixtures of potting media and levels of mycorrhizal.

Levels of Mycorrhizal					
Mixtures of the Potting	B1	B2	B3	Total	Mean
Media	3.5	4.0	3.8	11.3	3.76
A1	4.0	3.5	3.3	10.8	3.6
A2	3.3	3.8	4.0	11.1	3.7
A3	3.8	3.3	3.8	10.9	3.63
A4				44.1	
Total					11.02
Mean	NS				
f-test	12%				
cV%					

Survival rate

The seventh column of Table 3.6 shows the survival rate of dao seedlings. For factor 1 (mixtures of potting media), results show that all seedlings have a 100% survival rate. Analysis of variance showed no significant effect among treatment means of factor 1. It shows that the use of different mixtures of potting media has the same effect on the survival rate of dao seedlings.

For factor 2 (Levels of Mycorrhizal), all treatments show a 100% survival rate. Analysis of variance shows no significant effect among treatment means of factor 2. It shows that the levels of mycorrhizal have the same effect on the survival rate of dao seedlings.

For the treatment combinations (Table 3.6), analysis of variance shows no significant effect on the number of branches of dao. This implies that different mixtures of potting media and levels of mycorrhizal have the same effect on the growth of dao seedlings, specifically on the width of leaves.

Table 3.6. Two-way table on the survival rate of dao at different mixtures of potting media and levels of mycorrhizal

Levels of Mycorrhizal					
Mixtures of the Potting	B1	B2	B3	Total	Mean
Media	1.0	1.0	1.0	3	1
A1	1.0	1.0	1.0	3	1
A2	1.0	1.0	1.0	3	1
A3	1.0	1.0	1.0	3	1
A4				12	
Total					1
Mean					
f-fest	NS				
cv%	N/A				

Number of days to reach the plantable height (1 foot)

The seventh column of Table 3.7 shows the number of days to reach the plantable height (1 foot). For factor 1 (mixtures of potting media), the highest mean which is 39 was obtained by treatment A1 (Negative Control-Pure Garden Soil) and treatment A2 (Positive Control-Pure Vermicompost) got the lowest mean which is 32.8. Analysis of variance shows a highly significant effect among treatment means of factor 1. It shows that treatment A1 (Negative Control- Pure Garden Soil) got the longest days to reach plantable height (1 foot), while treatment A3 (50% garden soil + 50% vermicompost) and treatment A4 (75% garden soil + 25% vermicompost) have the same performance in the number of days to reach the plantable height. Treatment A2 (Positive Control-Pure Vermi compost) got the lowest days to reach the plantable height (1 foot). This implies that the use of pure vermicompost as potting media for dao seedlings can hasten the number of days to reach the plantable height (1 foot).

For factor 2 (Levels of Mycorrhizal), treatment B1- Control got the highest mean which is 36.9 while treatment B3-28 grams mycorrhizal/pot got the lowest mean of 35.4. Analysis of variance shows highly significant effect among treatment means of factor 2. It shows that B1- Control got the weak performance in terms of the number of days to reach the plantable height (1 foot), while B2 (14 grams mycorrhizal/pot) may have the same performance in either treatment B1 or B3. Treatment B3 (28 grams mycorrhizal/pot) got the lowest number of days to reach the plantable height of dao seedlings (1 foot). This implies that the use of a higher amount of mycorrhizal which is 28 grams may hasten the number of days to reach the plantable height of dao seedlings (1 foot).
For the treatment combinations (Table 3.7), analysis of variance shows a highly significant effect in the number of days to reach the plantable height (1 foot). This implies that 75% garden soil + 25% vermicompost with 28 grams mycorrhizal/pot may hasten the number of days to reach the plantable height (1 foot) of dao seedlings. The coefficient of variance is 1 %.

Table 3.7. Two-way table on the number of days to reach the plantable height (1 foot) of dao at different mixtures of potting media and levels of mycorrhizal.

Levels of Mycorrhizal					
Mixtures of the Potting	B1	B2	B3	Total	Mean
Media	40.0	39.0	38.0	117	39
A1	38.0	38.0	37.0	113	37
A2	36.0	35.5	34.8	106.3	35.43
A3	33.8	32.5	32.0	98.3	32.76
A4	147.8	145	141.8	434.6	
Total					144.19
Mean					
f-test	**				
cv%	1%				

CONCLUSION

The different mixtures of potting media did not affect the growth of dao seedlings in terms of number of leaves, length of leaves, width of leaves, number of branches, and survival rate, however, plant height and the number of days to reach the plantable height (1 foot) were highly affected. It implies that the use of 50% garden soil + 50% vermicompost can increase the height of dao seedlings and the use of pure vermicompost as potting media for dao seedlings can hasten the number of days to reach the plantable height (1 foot). The different levels of mycorrhizal inoculant did not affect the growth of dao seedlings in terms of number of leaves, length of leaves, width of leaves, number of branches, and survival rate, however, plant height and the number of days to reach the plantable height (1 foot) were highly affected. It implies that the use of 28 grams of mycorrhizal/pot can increase the height and hasten the number of days to reach the plantable height (1 foot) of dao seedlings. The different mixtures of potting media have a highly significant difference in the growth of cloned dao seedlings in terms of plant height and the number of days to reach the plantable height (1 foot). The different levels of mycorrhizal inoculant have a highly significant difference in the growth of cloned dao seedlings in terms of plant height and the number of days to reach the plantable height (1 foot). The different mixtures of potting media and different levels of mycorrhizal inoculant have a highly significant effect on the growth of cloned dao seedlings in terms of plant height and the number of days to reach the plantable height (1 foot). Plant height was highly affected using 50% garden soil + 50% vermicompost with 28 grams of mycorrhizal, and number of days to reach the plantable height (1 foot) was hastened using 75% garden soil + 25% vermicompost with 28 grams of mycorrhizal/pot.

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REFERENCES

Guerro, R. III (2004). "Handbook of Vermicompost & Vermimeal Production and Utilization. Aquatic Biosystems,. Bay, Laguna, Philippines. Retrieved last November 25, 2016 from ati.da.gov.ph.

Pakoy Que (2016). " Mycorrhiza, the Silent Miracle Worker". Department of Environment and Natural Resources, Visayas Avenue, Diliman, 1100 Quezon City, Philippines. Retrieved last November 25, 2016 from www.denr.gov.ph.

Department of agriculture (2016). Vermicomposting of Banana Trashes. Retrieved last November 25, 2016 from https://ati.da.gov.ph/rtc12/sites/default/files/Vermicomposting%20Leaflet.pdf

Stuart, G. (2019). Dao (Dracontomelon dao (Blanco) Merr. & Rolfe). Philippine Medicinal Plants. http://www.stuartxchange.org/Dao.html

FB MESSENGER GROUP CHAT CLASS LEARNING APPROACH EFFECTIVENESS: AUGMENTATION TO PEDAGOGY

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ABSTRACT This study aimed to discover the effectiveness of the Facebook (FB) Messenger Group Chat class interaction as a learning approach and augmentation to Pedagogy. Many higher education institutions use online instruction learning instruction to augment the teaching and learning process. Online education represents different forms of course delivery. It is subject to the same need for discussing, interacting, monitoring, and assessing as traditional forms of instruction. Students perceive the use of technology in their education, which would help faculty adjust pedagogy to increase student learning and satisfaction. Methods use in the study are research design, including why the chosen design is selected, personal profiles of the participants, researcher-made questionnaire, data collection, data monitoring, data analysis, and interpretation. Results revealed and analyzed that the overall level of effectiveness has a mean of 3.60, described as "more effective". The value of the total mean fell within the second highest scale, indicating that the level of effectiveness of the learning approach implemented was high. It was concluded and discovered the effectiveness of FB Messenger Group Chat class interaction as augmentation for pedagogy is more effective. This implies that FB chat class interaction adds a positive impact and augmentation to the student's way of learning, especially for millennial learners. They would feel convenience and enjoyment. They would also be aware of their sense of responsibility as they engaged in online activities. This is one of the teaching approaches that a teacher might use in class, especially when they were absent, for it is the simplest way that the students could manage and afford if technology is concerned, although; the obstruction that mostly hinders the involvement of students in technology is the internet connectivity issue.

Keywords: *effectiveness, group chat class, facebook*

INTRODUCTION

Background of the Study

Millennial education is in demand with the use of technology nowadays. It is coupled with expenses and skills. In the millennial era nowadays, the fact is, life becomes changes easily due to advances in technology. Since the 19th century, there is an increase in using web-based tools in economics, businesses, and many more. Today, many higher education institutions offer online instruction with integrated web-based instructional tools.
How about in the Guimaras State College setting? What do students think about online instruction as a way of learning? What makes students successful online with technology-aided education? Do they learn well through web-based instructional tools?

In this case, curiosity takes place on the part of the researchers, how it works and how to level up their teaching if they are going to use web-based instruction. Hence, the researchers responded to the call by introducing to the students the FB chat class interaction as an alternate to the classroom setting. With this, the researchers wanted to examine the augmentation of the Facebook online chat class interaction of students in the college, although there is Google classroom use by some professors, specifically in the College of Teacher Education. Online education represents different forms of course delivery, it is subject to the same need for discussing, interacting, monitoring, and assessing as traditional forms of instruction. At any institution, educators "should not only be concerned with the number of degrees awarded but also the quality of student learning obtained in achieving those degrees", Armstrong (2011). To that end, called for more research on how students perceive the use of technology in their education would help faculty adjust pedagogy to increase student learning and satisfaction (Warschauer, 2007).

The study was designed to address that gap. It was conducted to offer traditional classroom instruction, which is done in facebook online chat class interaction to level up the instructional teaching and learning process through online class interaction to avoid boredom on the part of the students by providing opportunities for students to access the course at their own pace and convenience.

This study was anchored to the e-Learning Model of Engelbrecht (2003), which states that the e-learning

model began as mere replication of classroom instruction but has evolved to those that integrate technology and pedagogy. Another one is the Mobile Learning Theory. In mobile learning, students learn both space and time and move from one topic to another topic. Like a blended environment, learners move in and out of engagement with technology. In mobile learning theory, it is the learner that is mobile, not the technology (Shuler, 2009). Mobile learning theory is essential when thinking of the role of mobility and communication in learning environments (Sharpes, Taylor, & Vavoula, 2005).

Objectives of the Study

The study wanted to find out the FB online chat class interaction in terms of its augmentation as another way of having a class, instead of doing it inside the classroom and facing each another in terms of topic discussion among fourth-year teacher education students of Guimaras State College for Academic Year 2018-2019, as respondents. It also wanted to know if there is a relationship between the personal profiles of the respondents and the FB online chat class interaction.

METHODOLOGY

The study discussed the methodology in accordance with the Teacher Education students' experiences with messenger FB online class interaction in relation to its effectiveness for augmentation of teaching and learning process. It covers research design, including why the chosen design is selected. It also includes personal profiles of the participants, data collection, data analysis, and interpretation. The study designed the constructivist-interpretative paradigm, which is based on hermeneutics (Wilhelm Dilthey) and relied on the participants being studied by generating data that reflect their profile and experiences that paradigm has also been prepared. This qualitative and quantitative study was anchored on the e-learning model and mobile learning theory.

Purposive sampling was used for the fourth-year education students represented by three class sections in one of the researchers' subjects. Each of the respondents was individually asked regarding his online learning experiences by answering the questionnaire prepared in relation to its augmentation to pedagogy. This study aimed to examine the FB online chat class interaction through messenger on the topics of the subject discussed instead of classroom class setting. The participants were asked by means of chatting and sending questions according to the topics presented and posted by the reporters on FB group chat for discussion. The total population of GSC fourth-year education students who have a subject under the researchers was 80. The researchers were participants in the topics discussed and interacted through FB online chat class interaction through messenger. Researchers' relationship with participants was done in respectful, cordial, honest, and impersonal. The relationship evolved, and participants were aware that they were gathering data from them to represent their ideas, knowledge, and understanding of the topics being discussed. Participants were becoming progressively more open and honest, sharing their ideas about the topics discussed online. Sometimes they used emoticons to express their thoughts and feelings toward the topics posted online. Participants were given questionnaires to be answered. Questions addressed how participants evaluated the FB group chat in messenger interaction as a learner. The questionnaires were sent to the participants online and in hard copy. All participants returned the questionnaires, filled out, after a week of classes for the first semester of the academic year 2018-2019. The FB Chat class interaction was piloted for the fourth-year education students of GSC–Mosqueda Campus first semester, academic year 2017-2018 as an alternative to the classroom class setting. The questionnaire was reviewed by three education professors with an extensive background in qualitative research from GSC. The questionnaire was administered and answered by the researcher students. The results of the pilot study were reviewed by the three education professors and found out the suitability for administration in the final study. It passed the process of reliability test by using Cronbach Alpha of 0.5 and content validity. Data of the FB Group Chat in Messenger class interaction were technologically and automatically stored in the group chat in relation to topics interaction. The researchers were considered as sole interviewers and data collectors in this study. The researcher's role in the study was that of the learner: listening to, observing, and learning from participants to capture their views and the meanings they would attach to the mobile way of learning instead.

RESULTS AND DISCUSSION

Table 1 summarizes the profiles of the respondents. The mean age of the respondents is 20 years old. The youngest is only 18 and the oldest is 24. Of the 80 respondents, 53 or 66.35% are female, 9 or 11.25% were male and the remaining 18 or 22.50% of respondents did not indicate their age. Most of the respondents are BSEd in course, more specifically in their following major: 28 or 35% are English, 15 or 18.75% are Mathematics, 10 or 12.50% are Social Science, and only 9 or 11.15% are Filipino. There were 18 or 22.50% were taking up the BEEd course. Their monthly household income is mostly in the range of Php 5,001–Php 10,000 (46 or 57.50%). The exact number of respondents had income ranging from Php 9,001 to Php 12,000, and with below Php 5,000 were 15 or 18.75%. Only 4 or 5% had income ranging from Php 13,000 and above. The respondents were also identified as to the distance of their home to school where majority of 20 (25%) were 5 to 15 kilometers far. Below 5 kilometers and more than 20 kilometers distance had the same number of respondents (15 or 18.75%), and 10 or 12.5% had distances ranging from 15 to 20 kilometers.

Table 1. Profile of the Respondents

Profile	F	%
Entire Group	80	100%
Age		
18 – 19	32	40.00
20 – 21	39	48.75
More than 21	9	11.25
Sex		
Male	9	11.25
Female	53	66.35
Did not indicate	18	22.50
Course		
BEED	18	22.50
BSEd English	28	35.00
BSEd Filipino	9	11.25
BSEd Social Science	10	12.50
BSEd Mathematics	15	18.75
Monthly Family Income		
Below Php 5,000	15	18.75
Php 5,001 – Pnp 8,000	46	57.50
Php 9,001 – Php 12,000	15	18.75
Php 13,000 and above	4	5.00
Distance of House	15	
Below 5 km	20	18.75
5.10 – 10.00 km	20	25.00
10.10 – 15.00 km	10	25.00
15.10 – 20.00 km	15	12.50
More than 20 km		18.75

Table 2 presents the level of effectiveness of the online learning approach using one of the social media sites. The effectiveness was measured in terms of the computed mean based on the respondents' rate on the effect of the method/approach used in their learning of the subject. Results revealed that the overall level of effectiveness has a mean of 3.60, described as "more effective." The value of the total mean fell within the second highest scale, indicating that the level of effectiveness of the learning approach implemented was high. As shown in Table 2, out of 25 items, 20 items had a mean which described as more effective and only 5 items were described as equally effective.

Table 2. Effectiveness of Online Learning Approach using Social Media Site

Online FB group chat class interaction is …	Mean	Description
offering convenience.	4.13	More Effective
meeting individual learning needs.	3.38	Equally Effective
contributing to effective communication in the class.	3.53	More Effective
increasing the sense of community with the instructor and fellow students.	4.03	More Effective
promoting greater student participation and interaction.	3.84	More Effective
supplying lots of information from various resources in the web.	3.94	More Effective
widening the sense of responsibility of a learner.	4.10	More Effective
making the learner to be lazy in doing his tasks on time.	3.66	More Effective
adding extra expenses in order to be online.	3.03	Equally Effective
updating oneself in the latest trend of learning.	3.96	More Effective
frustrating if the signal is not enough and couldn't get in right away in the interaction.	2.73	Equally Effective
delaying of getting information from professor and fellow students.	2.66	Equally Effective
interesting to learn more from fellow students interaction.	4.06	More Effective
exciting of knowing who are online regardless of not seeing each other.	3.93	More Effective
enhancing the knowledge gained.	3.86	More Effective
having fun with fellow students online by interacting pros and cons ideas.	4.10	More Effective
joining in the online education is hands-on.	4.06	More Effective
having online interaction and discussion is	3.41	Equally Effective
not the second-best alternative to face-to-face classes.	3.70	More Effective
encouraging lots of human interaction.	3.86	More Effective
building long relationship through online classes.	3.53	More Effective
doing not everything alone.	2.75	Equally Effective
to be online classes means also offline learning.	2.79	Equally Effective
needing not to read books.	3.29	Equally Effective
catering not one own style of learning.	3.74	More Effective
needing not to participate in the classroom activities.	3.60	More Effective
Total		

The FB Messenger Group Chat class interaction serves as another teaching approach for the learning experiences and perceptions of the fourth year education students of Guimaras State College. It allows for more efficiency and reflection in data analysis. Uploaded data were classified according to the study's research questions. Specifically, data were coded by using appropriate statistical tools. Analyzing each item, the most rated item garnered a mean of 4.13 was found in item no. 1, which indicates that online interaction is more convenient for them compared to traditional one. The second most rated garnered a mean of 4.10 where respondents believe that a non-face-to-face interaction with the teacher could widen their responsibility (item no. 7) and it gives fun by interacting pros and cons ideas together with their classmates (item no. 16). The third highest rated mean was 4.06, where respondents found it more interesting to learn (item no. 13) and were aware of joining an online education is hands-on with electronic devices (item no. 17). These highest rated items were all described as more effective or the effectiveness of the online interaction set to high. On the other hand, the lowest item garnered a mean of 2.66. When slow internet connectivity occurs, they experienced a delay in accessing information from their teacher and classmates (item no. 12). This occurrence resulted in disappointment because they could not do the task right away (item no. 11, M=2.73). The next lowest rated item garnered a mean of 2.75, which indicates that the students expressed that learning online was also the same way as learning offline, where most of them somewhat disagree (item no. 22). They also disagreed that learning through online interaction does not need to read books (item no. 23, M=2.79). Lastly, they expressed that online tasks give them additional extra expenses (item 9, M=3.03). These least rated items were all described as equally effective or just an average level. Moreover, the middle items garnered mean within 3-4, where it highlights the possible outcome where students could probably build a long relationship online and it promotes greater participation of everybody where they prefer to express thoughts confidently unlike the usual classroom interaction setting. The perceived effect is also noted that some students were taking advantage of not finishing the task on time because of unexpected occurrences, but then they have been given an opportunity to learn new things and develop skills.

CONCLUSION

The overall assessment of the effectiveness of FB online chat class interaction as augmentation for pedagogy is more effective. This implies that FB chat class interaction positively impacted and augmented the student's way of learning, especially in millennial education. Students felt convenience and enjoyment. They were also aware of the sense of responsibility as they engaged in online activity. This is one of the teaching approaches that a teacher might use in class especially in his/her absent, for it is the simplest way that the students could manage and afford if technology is concerned, although; the obstruction that mostly hinders the involvement of students in technology is the internet connectivity issue.

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REFERENCES

Allen, I. E., & Seaman, J. (2010). Class differences: Online education in the United Stat Allen,

I. E., & Seaman, J. (2011). Going the distance: Online education in the United States, 2011 Retrieved from http://www.onlinelearningsurvey.com/reports/goingthedistance.pdf

Allen, I. E., & Seaman, J. (2014). Grade change: Tracking online education in the United States. Babson Park, MA: Babson Survey Research Group and Quahog Research Group.
Retrieved from http://www.onlinelearningsurvey.com/reports/gradechange.pdf

Alden, J. (2010). Use of wikis to support collaboration among online students. In H. Yang, & S. Yuen, Collective Intelligence and e-learning 2.0: Implications of web-based communities and networking (pp. 110-126). New York, NY: IGI Global.

Association for the Advancement of Computing in Education (AACE). Retrieved December 20, 2017 from https://www.learntechlib.org/p/30504/

Baker, G. (2010). The impact of instructor immediacy and presence for online student affective learning, cognition, and motivation. The Journal of Educators Online, 7 (1), 1-30. Retrieved from http://www.anitacrawley.net/Articles/BakerPaper.pdf

Bernard-Brak, L., Lan, W. Y., & Paton, V. O. (2010). Profiles in self-regulated learning in the online learning environment. The International Review of Research in Open and Distance Learning, 11(1), 183-202.

Berridge, G. G., Penney, S., & Wells, J. A. (2012). eFACT: Formative assessment of classroom teaching for online classes. Turkish Online Journal of Distance Education, 13(1), 68-78

Bradley, W. E. (2011). A conceptual framework for the design and evaluation of online learning modules in professional training and academic education in business. Proceedings of the American Society of Business and Behavioral Sciences, 18(1),196-207. Retrieved from http:asbbs.org/files/2011/asbbs2011v1/pdf/b/bradleyw.pdf

Bullen, M., Morgan, T., & Qayyum, A. (2011). Digital learners in higher education: Generation is not the issue. Canadian Journal of Learning and Technology, 37 (1),np. Retrieved from: http://www.cjlt.ca/index.php/cjlt/issue/view/71

Clark,R C., & Mayer,R.E. (2016), E-learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning

Cole, J. I., Suman, M., Schramm, P., Zhou, L., Salvador, A. (2013). The digital future project 2013: Surveying the digital future. The World Internet Project. Retrieved from http://www.worldinternetproject.net/_files/Published/_oldis/713_2013_digital_future_report_usa.pdf

Dunston, J. & Albalawi, J. (2014). Improving satisfaction and delivery of graduate courses in an online program. Proceedings of the 2014 Midwest Section Conference of the American Society for Engineering Education

Fallon, G. (2011). Making the connection: Moore's theory of transactional distance and its relevance to the use of virtual classroom in postgraduate online teacher education. Journal of Research on Technology in Education, 43 (3), 187-209.

Galy, E., Downey, C., & Johnson, J. (2011). The effect of using e-learning tools in online and campus-based classrooms on student performance. Journal of Information Technology Education Research, 10 (1), 209-230.

Glesne, C. (2011). Becoming qualitative researchers: An introduction (4th ed.). Boston, MA: Pearson Education, Inc.

Grandzol, C. J., & Grandzol, J. R. (2010). Interaction in online courses: More is not always better. Online Journal of Distance Learning Administration, 13 (2), 12-18.
Retrieved from http://www.westga.edu/~distance/ojdla/summer132/GrandzolGrandzol132. Html

Kuo, Yu-Chun, Walker, A. E., Belland, B. R., & Schroder, K. E. (2013). A predictive study of student satisfaction in online education programs. The International Review of Research in Open and Distance Learning, 14(1), 35-50. Retrieved from: http://files.eric.ed.gov/fulltext/EJ1008076.pdf

Laaser, W. (2011). Economics of distance and online learning: Theory, practice and research. International Review of Research in Open and Distance Learning, 12(2), 138-142.

Lint, A. H. (2013). Academic persistence of online students in higher education impacted by student progress factors and social media. Online Journal of Distance Learning Administration, 16(4), 718-745.

Moore, M., & Kearsley, G. (2012). Distance education: A systems overview of online learning. Belmont, CA:Wadsworth.

Murray, M. C., Perez, J., Geist, D., & Hedrick, A. (2013). Student interaction with content in online and hybrid courses: Leading horses to the proverbial water. Informing science: The International Journal of an Emerging Transdiscipline, 16,9499-115. Retrieved from http://www.inform.nu/Articles/Vol16/ISJv16p099-115MurrayFT114.p

Nwankwo, A.A. (2015). Students' learning experiences and perceptions of online course content and interactions. Dissertation Thesis. Doctor of Education. Walden University. https://scholarworks.waldenu.edu/cgi/viewcontent.cgi?article=1187&context=dissertations

Simonson, M., Smaldino, S., Albright, M., & Zvacek, S. (2012). Teaching and Learning at a distance: Foundations of distance education. Boston, MA: Pearson.

Siti Sarah, M. J., & Issham, I. (2011). The effectiveness of e-learning portal in distance education as perceived by students in University Sains Malaysia. Malaysian Journal of Distance Education, 13 (1), 47-57. Df

Tsayang, G. (2011). Bachelor of education in educational management students'perceptions of their program study: Case of University of Botswana. International Journal of Scientific Research in Education, 4 (1), 17-26.

Vogt, W. P. (2010). Quantitative research methods for professionals. Boston, MA:Pearson Custom Publishing.

Russell, Jae-eun Lee. (2013). Supporting students' motivation in college online courses (Doctoral dissertation). Retrieved from: http://ir.uiowa.edu/cgi/viewcontent.cgi(4749).

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ECONOMIC STATUS OF THE MANGO INDUSTRY IN THE PROVINCE OF GUIMARAS

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ABSTRACT In the Philippines, mango ranks the third most important fruit croup based on export volume and value next to pineapple and banana. Majority of the mango traders were 38 years old to 47 years old, with 53.3%. Most of the mango traders were also female with, 56.7%. As to their civil status, most of them are married, with 80%. As to their educational attainment, most of them have undergone college, with 70%. As to their average monthly income, most of them have Php 20,001 to Php 45,000 monthly income, with 30%. As to their business capital, most of them have put up more than Php 30,000 for their business. Results revealed that (12 or 40%) of the respondents said that the supply of the mango industry in Guimaras is low and the demand is high, the supply is high and demand is low (8 or 26.7%), and both the demand and supply are low (7 or 23.3%). The factors that mostly affect the low supply and demand of the mango industry are bad weather/ continuous rainfall (25 or 83.3%), higher price of pesticides (21 or 70.0%), and off-season (20 or 66.7%). It is shown that (22 or 73.3%) believed that conducting lectures/seminars about mangoes, sponsoring mango plantations (18 or 60.0%), and exporting mango products (17 or 56.7%) are the best strategic options or interventions to improve the mango industry in Guimaras.

Keywords: *economic, mango, status*

INTRODUCTION

Mango fruit, "the king of fruits," is one of the most popular, nutritionally rich fruits with unique flavor, fragrance, taste, and health-promoting qualities, making it numero-uno among new functional foods, often labeled as "super fruits" (Nutrition-and–you.com, 2015).

As one of the sweetest mangoes in the world, known as Manila Super-Mango, the mangoes of Guimaras Island are considered as one of the best mango varieties in the world. In fact, in 1995 the Guimaras Book of World Records dubbed the Manila Super Mango as the sweetest of its kind. When we say the world's sweetest, these are the golden yellow mangoes with the enticing smell, sugary but somewhat tangy, succulent, meaty, and deliciously tempting mangoes specifically harvested from Guimaras Island (ARMMRBOI, retrieved on October 24, 2015).

Guimaras is an island province in the Philippines located in the Western Visayas region. Among the smallest province, its capital is Jordan. The province is situated in the Panay Gulf, between the island of Panay and Negros. To the northwest is the Negros Occidental. The Island is part of the Metro Iloilo-Guimaras, one of the twelve metropolitan areas of the Philippines (www.agropolis.org, 2015). Guimaras mangoes are touted as the sweetest in the world, thus the demand for it in local and international markets is high and it has become a centerpiece of the province of Guimaras' tourism (Iloilo Today, 2015).

With this, the researchers were interested in determining the status of the supply and demand of the mango industry in Guimaras and any underlying factors affecting the drop or the increase of the demand and supply.

Statement of the Problem

This study was conducted to analyze the status of the mango industry in the province of Guimaras. Specifically, this study sought answers to the following questions: (1) What is the business profile of the respondents in terms of age, sex, civil status, educational attainment, business capital, and average business monthly income; (2) What is the status of mango industry in Guimaras in terms of demand and supply (3) What are the factors affecting the supply and demand of mango industry in Guimaras, and (4) What are the strategic options or interventions to improve the mango industry?

METHODOLOGY

This study aims to analyze the economic status of the mango industry in the province of Guimaras. This quantitative study was employed descriptive content analysis to describe the nature of the situation as it exists at the time of the study and to explore the uses of a particular phenomenon. According to the Research Guides at the University of Southern California (2001), quantitative methods emphasize objective measurements and the statistical, mathematical, or numerical analysis of data to be collected through polls, questionnaires, and surveys, or by manipulating pre-existing statistical data using computational techniques. This study covered the whole province of Guimaras composed of five municipalities namely: Buenavista, Jordan, San Lorenzo, and Sibunag. The researchers choose to cover the whole province so that they would know the status of the mango industry in each municipality. The respondents of the study were mango farmers and traders based on the current list of registered mango traders taken from the Department of Trade and Industry, province of Guimaras. The data needed in the study were gathered using the researchers–made questionnaire. The questionnaire was composed of two (2) parts. Part 1 is dealing with the personal profile of the respondents. Part 2 was focused on the mango traders determining the status of the mango industry in terms of demand and supply. It is a list of questions which are intended to elicit answers to problems of the study. After validating the questionnaires, the same was revised, reproduced and distributed with an approved letter addressed to the respondents. The researchers themselves personally administer the survey questionnaires to the mango traders. Each respondent was given sufficient time to answer the question as honest as possible. Then, the researchers consolidated all the data gathered for analysis and interpretation. The researchers understood that people's consciousness might also affect their honesty and effectiveness in answering the survey, so the researchers gave people the option of being anonymous. The data tabulated were computed using excel, analyzed using the SPSS and treated using statistical tool. The data gathered were analyzed using the frequency count and percentage for descriptive analysis.

RESULTS AND DISCUSSIONS

Table 1 presents the profile of respondents when categorized as to age, sex, civil status, educational attainment, business capital, and average monthly income. As to age group of the business owners engaged in the mango business industry, only 3.3% or 1 respondent is 27 years old and below, 10% or 3 respondents are 28 to 37 years old, 53.3% or 16 respondents are 38 to 47 years old, and 33.3% or 10 respondents are 48 years old and above. This shows that the majority of the mango traders are 38 years old and above. Majority of the mango traders were 38 years old and above, married, and more businesswomen were involved into mango industry due to their competency in trading than men. College level was recorded as the highest education attained by the mango traders in Guimaras. Also, it indicated that almost half of the mango traders in Guimaras had a business capital of more than Php 30,000. However, statistics showed more mango traders had generated low monthly income than others.

Table 1. Profile of the Respondents

Particulars	Frequency	Percent	Rank
Age	1	3.3	
27 Years Old and Below	3	10.0	4
28 to 37 Years Old	16	53.3	3
38 to 47 Years Old	10	33.3	1
47 Years Old and Above	30	100.0	2
Total			

Sex	12	40.0	2
Male	17	56.7	1
Female	1	3.3	3
No Response	30	100.0	
Total			
Civil Status:	4	13.3	2
Single	1	3.3	3
Widow/Widower	24	80.0	1
Married	1	3.3	3
Separated	30	100.0	
Total			
Educational Attainment	21	70.0	1
College Level	7	23.3	2
High School Level	2	6.7	3
Elementary Level	0	100.0	
Total			
Business Capital			
Below Php 5,000.00	3	10.0	5
Php 5,001.00-Php 10,000.00	4	13.3	3
Php 10,001.00-Php 15,000.00	5	16.7	2
Php 15,001.00- Php 20,000.00	4	13.3	3
Php 20,001.00- Php 30,000.00	1	3.3	6
More than Php 30,000.00	13	43.3	1
Total	30	100.0	
Average Monthly Business Income:			
Below Php 5,000.00	7	23.3	3
Php 5,001.00- Php 10,000.00	8	26.7	2
Php 10,001.00- Php 20,000.00	4	13.3	4
Php 20,001.00- Php 45,000.00	9	30.0	1
Php 45,001.00- Php 75,000.00	1	3.3	5
More than Php 75,000.00	1	3.3	5
Total	30	100.0	

Factors affecting the Mango Industry and Strategic Options

Table 2 shows the factors affecting the mango industry and strategic options. In terms of the status of the supply and demand of the mango industry in Guimaras, almost half of the respondents, which is equivalent to 40% or 12 respondents, said that the current supply of the mango is low affecting the high demand of mangoes. While 8 (26%) respondents are experiencing high supply of mangoes because of its low demand. On the other hand, 7 (23.3%) respondents said that both the demand and the supply of mangoes are low and the remaining 7 (23.3%) respondents said that both the supply and demand of mangoes are high. This result indicated that the demand for Guimaras mangoes locally and internationally is high, causing the supply of the mangoes in the province to become low.

The relationship between the prices and the supply and demand, when the supply is high and the demand is low, the prices are most likely to decrease according to 23 (76.7%) respondents. When the supply is low and the demand is high, that the price of mango is likely to increase based on 21 (70%) respondents. When both the demand and supply are low, it is most likely that prices of mangoes would remain the same, according to 18 (60%) respondents. When both the demand and supply are high, 21 (70%) said the prices would remain the same.

The factors affecting the low supply of mango industry in Guimaras. Based on the multiple responses of the mango traders, the factor that mostly affects the low supply of mango industry in Guimaras is the Bad/Weather or the continuous rainfall with 25 respondents or an equivalent of (83.3%) followed by the higher price of pesticides with 21 responses or an equivalent of (70%), Off-season with 20 responses or an equivalent of (66.7%), fewer financers with 13 (43.3%) respondents, and oil price hike and mango plantation to subdivision/commercial land with each have 8 (26.7%) responses.

The factors that mostly affects the high supply of mango industry in Guimaras are the appropriate season and the good weather which has gotten 24 responses or 80%, respectively. In addition, 21 (70%) respondents said that the high supply of mango is also due to the mangoes being grown in the appropriate season. While 20 (66.7%) respondents said that the supply of mangoes would be high if less pests are consuming the mango plantation. Meanwhile, 12 (40%) respondents said that the high supply of mango is also due to more financers investing in this kind of business. Moreover, 9 (30%) respondents said the high supply of mango industry in Guimaras is due to the lower price of oil. The factors affecting the high demand of mango industry in Guimaras. All the respondents (30 or 100%) believed that the factor that affect the high demand of mango industry in Guimaras mostly is the good quality of mangoes. While (70% or 21) respondents said that the high demand of mango industry in Guimaras is because of the high number of tourists. Moreover, 66.7% or 20 respondents said that the high demand of mangoes is based on the good season. The other 43.3% or 13 respondents said that the high demand of mangoes is because of more markets or promotions and the other (30% or 9) respondents said that the high demand of mango industry in Guimaras is due to its high product exports.

Based on the responses of the mango traders, 22 (37.3%) of them said that the off-season for mangoes is the primary reason why there is a low demand for the mango industry in Guimaras. Meanwhile, 20 (66.7%) respondents said that the low quality of mangoes is affecting the low demand of mango industry in Guimaras, followed by low numbers of tourists with 17 (56.7%) responses, fewer markets/promotions with 12 (40%) responses and low product exports with 11 (36.7%) respondents.

As to the strategic options or interventions to improve the mango industry in Guimaras, 22 (73.3%) respondents believe that conducting lectures/seminars about mangoes is the best strategic option or intervention to improve the mango industry in Guimaras. Moreover, 18 (60%) respondents also believe that sponsoring mango plantations is also one strategic option or intervention to improve the mango industry in Guimaras, followed by exporting mango products with 17 (56.7%) responses, innovating mango products with 15 (50%) responses, online marketing/promotions with 10 (33.3%) responses and media broadcast with 6 (20%) respondents.

Table 2. Factors Affecting the Mango Industry and Strategic Options

Items	Frequency	Percent	Rank
Status of the Supply and Demand of the Mango Industry in	8	26.7	2
Guimaras	12	40.0	1
The Supply is High and the Demand is Low	7	23.3	3
The Supply is Low and the Demand is High	3	10.0	4
Both the Demand and the Supply are Low			
Both the Demand and the Supply are High			
Factors Affecting the Low Supply of Mango Industry	21	70.0	2
Higher Price of Pesticide	13	43.3	4
Less Financers	8	26.7	5
Oil Price Hike	25	83.3	1
Bad Weather/Continuous Rainfall	20	66.7	3
Off-Season	8	26.7	5
Mango Plantation to Subdivision/Commercial Land			
Factors Affecting the High Supply of Mango Industry in Guimaras			
More Financers	12	40.0	1
On-Season	24	80.0	1
Good Weather	24	80.0	6
Lower Price of Oil	9	30.0	3
Mangoes in Appropriate Weather	21	70.0	4
Less Pests	20	66.7	

Factors Affecting the High Demand of Mango Industry in Guimaras	21	70.0	2
Number of Tourist	30	100.0	1
Good Quality of Mango	9	30.0	5
High Product Exports	20	66.7	3
Good Season	13	43.3	4
More Market/Promotions			
Factors Affecting the Low Demand of Mango Industry in Guimaras			
Low Number of Tourist	17	56.7	3
Low Quality of Mango	20	66.7	2
Low Product Exportsw	11	36.7	5
Off-Season	22	73.3	1
Less Markets/Promotions	12	40.0	4
Strategic Options or Interventions to Improve the Mango Industry			
Exporting Mango Products	17	17	3
Sponsoring Mango Plantation	18	18	2
Processing New Mango Products	15	15	4
Conducting Lectures/Seminars about Mangoes	22	22	1
Online Marketing/Promotions	10	10	5
Media Broadcast	6	6	6

Status of the Supply and Demand

When the supply of mangoes is high and demand is low, majority of the respondents answered that the price decreased (23 or 76.7%), increased (3 or 10.0%), maintained (3 or 10.0%), and (1 or 3.3%) did not respond. When the supply is low and the demand is high, majority of the respondents answered that the price increased (21 or 70.0%), maintain (7 or 23.3%), decreased (1 or 3.3%), and overprices (1 or 3.3%). When both the demand and the supply are low, majority of the respondents answered that the price was maintained (18 or 60.0%), decreased (7 or 23.3%), and increased (5 or 16.7%). When both the demand and supply are high, majority of the respondents said that the price was maintained (21 or 70.0%), increased (5 or 16.7%), decreased (3 or 10.0%), and overpriced (1 or 3.3%).

Majority of the mango traders answered that the price decrease (23 or 76.7%) when the supply is high, and the demand is low. Majority of the mango traders answered that the price increased (21 or 70.0%) when the supply is low and the demand is high. Majority of the mango traders answered that the price was maintained (18 or 60.0%) when both demand and supply are low. Majority of the respondents answered that the price is maintained (21 or 70.0%) when the demand and supply are high.

Table 3. Status of Supply and Demand

Particulars	Frequency	Percentage	Rank
The Supply is High and the Demand is Low	3	10.0	2
Increase	23	76.7	1
Decrease	3	10.0	2
Maintain			
Overpricing		3.3	4
No Response	1	100.0	
Total	30		

The Supply is Low and the Demand is High		70.0	1
Increase		3.3	3
Decrease	21	23.3	2
Maintain	1	3.3	3
Overpricing	7		
No Response	1		
Both the Demand and the Supply are Low			
Increase			
Decrease	5	16.7	3
Maintain	7	23.3	2
Overpricing	18	60.0	1
No Response			
Total	30	100.0	
Both the Demand and the Supply are High			
Increase			
Decrease	5	16.7	2
Maintain	3	10.0	3
Overpricing	21	70.0	1
No Response	11	3.3	4
Total			
	30	100.0	

CONCLUSION

Majority of the mango traders are 38 to 47 years old and female dominantly mango traders. Most traders are married and have undergone college with an average monthly income of Php 20,001 to Php 45,000 and business capital of more than Php 30,000. The supply of mango industry in Guimaras is low and the demand is high. The factor that mostly affects the supply and demand of the mango industry is the season. Conducting lectures/seminars about mangoes is the best strategic option or intervention to improve the mango industry in Guimaras.

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REFERENCES

Arnaldo, T. S. (2016). Mangoes Boost Guimaras Economy and Tourism. A Day in September. http://www.tishaseptember.com/2016/05/mangoes-boost-guimaras-economy-and.html

Cobb, C.W. (1928). A theory of production. The American Economic Review, 18 (1) pp. 139-165. Retrieved November 17,2015.

Guimaras Island Blog (2015). About Guimaras. https://guimarasislandblog.wordpress.com/about-guimaras/, Retrieved on November 17, 2015

Centeno, M.G. (2016). The Guimaras Island. Explore Iloilo. https://mariegenecelacenteno.wordpress.com/2016/03/09/the-guimaras-island/

Detourist, M. (2016).
Guimaras Guide for First Time Traverlers.
https://www.exploreiloilo.com/guide/guimaras-philippines/www.agropolis.org (2010), retrieved on October 28,2015
Businessdictionary.com, retrieved on November 23,2015
www.britanica.com (2015), retrieved on November 20,2015
www.entrepreneur.com (2004), retrieved December 12,2015
Organic Facts.net (2001), retrieved on January 19,2016
www.freedictionary.com (2005), retrieved December 28,2015
guimaras.gov.ph, retrieves on November 22,2015
www.investppedia.com (2002)retrieved on December 20,2015
Lonely Planet.com, retrieved on January 27,2016
The Office of Research Integrity(2005)retrieved on March 2,2016
Medical News Today.com(2001)retrieved on January 24,2016
Pinoy Money Talks.com,retrieved on February 2,2016
Rboi.armm.gov.ph (2013), retrieved on October 24,2015
Truththeory.com (2013), retrieved on November 14,2015
Tourism.gov.ph, retrieved on January 8,2016