

**STUDENTS' PROBLEM-SOLVING DIFFICULTIES
IN THE NEW NORMAL EDUCATION**

**College of Teacher Education
BOHOL ISLAND STATE UNIVERSITY
Zamora, Bilar, Bohol**

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STUDENTS' PROBLEM-SOLVING DIFFICULTIES
IN THE NEW NORMAL EDUCATION

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The Faculty of College of Teacher Education
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In Partial Fulfillment of the Requirements for the Degree of
Bachelor of Secondary Education Major in Mathematics

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APPROVAL SHEET

This thesis entitled "STUDENTS' PROBLEM-SOLVING DIFFICULTIES IN THE NEW NORMAL EDUCATION", was prepared and submitted by Joan O. Busbuso, Roberto C. Caño Jr., Jumie E. Cabarrubias in partial fulfillment of the requirements for the degree Bachelor in Secondary Education major in Mathematics, has been examined and recommended for acceptance and approval for oral defense.


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The Researchers

DEDICATION

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ABSTRACT

The main thrust of this study was to determine if age, sex, year level and personality types are predictors of students' difficulties in problem-solving in the new normal education. Specifically, this study sought to find out the profile of the respondents in terms of their age, sex, and number of students per year level and their personality types in terms of the Big Five Personality Inventory such as extraversion, agreeableness, conscientiousness, neuroticism, and openness. There were thirty-four Second Year students and thirty-two Third Year students of Bachelor of Secondary Education Major in Mathematics of Bohol Island State University Bilar-Campus A.Y. 2021-2022. The researchers used a modified survey questionnaire to gather the data. The items of the instruments were pilot tested and item analyzed. For the statistical treatment of the study, simple percentage was used to describe the demographic profile of the students, the weighted mean was used to get the quantitative data of the level of difficulty of students' difficulties in problem-solving, the BFI scoring scale and the multiple regression used to analyze the predictors were employed. The result revealed that age, sex, year level, extraversion, agreeableness, neuroticism, and openness are not predictors of the students' learning difficulties in problem-solving. Among the personality types of the students, only conscientiousness showed as predictor of the learning difficulties met by the students. The personality types of the students rated as Moderate. Also, the level of difficulty of students' difficulties was rated as Moderate. Thus, the result showed that the learning difficulties met by the students moderately affect their academic performance. As for recommendation, since the result of the study revealed that the profile of the students and their personality types except only in conscientiousness were not predictors and the learning difficulties of the students moderately affect their academic performance, but still it should have a collaborative learning and effort between the teacher and the student to improve their way of learning and to lessen their difficulties in solving problems. In addition, it is also recommended that the future researchers who will conduct related studies covering other variables not present in this study may use the result of this study as a reference. The result of this study may also serve as a reference for other researchers to formulate strategies that will help in alleviating mathematics difficulties.

TABLE OF CONTENTS

TITLE PAGE	i
APPROVAL SHEET	ii
ACKNOWLEDGEMENT	iii
DEDICATION	v
ABSTRACT	vi
TABLE OF CONTENTS	vii
LIST OF TABLES	ix
LIST OF FIGURES	x
Chapter 1	Pages
THE PROBLEM AND ITS SCOPE	
Rationale	1
Literature background	4
THE PROBLEM	
Statement of the problem	16
Significance of the study	17
RESEARCH METHODOLOGY	
Design	19
Environment and Participants	19
Instrument	20
Data Gathering	22
Statistical Treatment	23

DEFINITION OF TERMS	25
Chapter 2	
PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA	
Profile of the respondents	27
Big Five Inventory of Personality Types	
Personality Types: Extraversion	28
Personality Types: Agreeableness	29
Personality Types: Conscientiousness	30
Personality Types: Neuroticism	32
Personality Types: Openness	33
Level of Difficulty of students' difficulties in Problem-Solving	
Teacher Factor	35
Student Factor	36
Flexible learning Factor	37
Chapter 3	
SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS	
Summary of findings	41
Conclusions	42
Recommendation	43
Proposed Action Plan	45
REFERENCES	52
APPENDICES.....	56
A. Letters	57
B. Instrument	60
A. Raw data	66
Frequency on the Personality Types	68
Frequency on the Learning Difficulties	69
CURRICULUM VITAE	70

LIST OF TABLES

1	Profile of the respondents	28
2.1	Personality Types of the Students in terms of Extraversion	29
2.2	Personality Types of the Students in terms of Agreeableness	30
2.3	Personality Types of the Students in terms of Conscientiousness	31
2.4	Personality Types of the Students in terms of Neuroticism	32
2.5	Personality Types of the Students in terms of Openness	34
2.6	Composite Mean of Each Personality Types of the Students	35
3	Level of Difficulty of Students' Difficulties in Problem-Solving	38
4	Predictors of Students' Learning Difficulties in Problem-Solving	39
5	Predictors of Students' Learning Difficulties in Problem-Solving in terms of Personality Types	40

LIST OF FIGURES

1	Theoretical and Conceptual Framework	15
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Chapter 1

THE PROBLEM AND ITS SCOPE

INTRODUCTION

Rationale

Mathematics is fun but a challenging one. It develops the critical thinking and problem-solving skills of the students. Most of the students find Mathematics as a complicated subject without knowing that it plays a crucial role in all walks of a person's life. It allows the student to think critically which improve their metacognition. It equips students with knowledge and skills to face the fast-changing world and globally-competitive society. These skills include logical reasoning, problem- solving skills and thinking skills in abstract ways.

However, a metamorphic change of the educational system in the Philippines due to COVID'19 gives another burden to the school administrators, teachers, parents and, of course, the students. At this trying point of time, education is still on its line but in a new normal way of teaching by means of technology.

According to Kurt (2010), technology can develop a learning environment that facilities higher-order thinking and have a significant advantage in education. In addition, Bulut & Delen (2011) mentioned that students who spent more time in technology were shown to perform better on mathematical skills.

In addition, Yu. Z. (2021) focused the effects of gender, educational level, and personality on online learning outcomes during the COVID 19 pandemic.

Findings regarding gender differences in online learning outcomes tend to be inconsistent and even paradoxical. Online female learners prove more perseverant and engaged than males (Richardson & Woodley, 2003), while males tend to hold more stable positive attitudes toward online learning (Nestor, 2013).

Problem-solving in Mathematics is an intricate process which calls for a mathematically gifted individual. Problem-solving, one of the hardest things to do, even in a face to face set up is now the most challenging and difficult subject content in this new normal education.

Most of the students have a hard times and difficulties in solving Mathematics problems. As stated by Rysdon (2010) the greatest reason why students are performing poorly in Mathematics is because they are still having a hard time finding the relevance of mathematics in their lives. This is probably the reason why a number of students really find Mathematics difficult, tedious, and even hate the subject. Many students believed that problem- solving is just another additional burden and can't even improve their Mathematical comprehension.

Students commonly encounter difficulties in problem-solving because they don't have sufficient mastery of basic knowledge and skills in Mathematics. This insufficiency of basic Mathematical concepts may lead to confusion and difficulties. Students may respond to this negatively if they lack confidence, motivation, and support morally and educationally.

Difficulties in problem- solving are worthy of serious instructional attention for these may hinder the growth of the students in this area. Mazzocco (2011)

stated that children have difficulty with Math for different reasons and that they need a single type of special instruction or an appropriate Math curriculum.

Furthermore, Rajkumar, R., & Hema, C. (2017) emphasized Dyscalculia which means the learning issues that gives great impact to Mathematics difficulties and the challenges show up everywhere with homework, class work, test and daily tasks. They may have trouble in doing some tasks which leads to negative result and low academic performance.

It is in regard that the researchers are motivated to conduct this study to know if age, sex, year level and personality types are predictors of students' difficulties in problem-solving and at the same time challenged by all their concerns when it comes to problem-solving which leads to difficulties in learning so that recommendations and action plan can be proposed to address the learning difficulties of the students.

Furthermore, the findings of the study would be utilized as a basis to plan activities that may help teachers find a solution to the learning difficulties met by the students.

LITERATURE BACKGROUND

The Philippine education never stops emphasizing that in the educational system, it is the quality education for the youth that serves as the pillars in nation building. Educators have to continue the fight for the right and for the privilege of each Filipino child to access to quality education because success is now close at hand (Hidalgo as cited by Urboda 2015).

Richard Jessor's "Problem- Behavior Theory", states that all behavior is the result of person- environment interaction. Behavior that is socially defined as a problem, as a source of concern, or as undesirable by the social and/or legal norms of conventional society and its institutions of authority. This states that the behavior of the students is acquired not only from his or her family but also the influences of their peer groups and all the people that surrounds him/her in the community.

Furthermore, "Achievement Motive Theory" (McClelland, D.C.) focuses on achievement motive rather than any other factors because he thought that it is the most important key for students to succeed in their study. Any student who has high achievement motive will have high concentration in learning and he will be then successful in his study. On the other hand, if one has low achievement motive, he lacks concentration, would have difficulties in problem-solving and he will not achieve in his study as a result. Problem solving is a motivated process and determined by human motivations and needs.

Based on the Basic Education Curriculum of 2002, the objective of Secondary Education Curriculum in Mathematics is to develop skills in higher

intellectual operations, critical and creative thinking, and more complex comprehension and expression activities in varied life situations.

As mandated in the DepEd Memorandum No. 13, s. 2012, the fourth Mathematics Association of the Philippines (MTAP) National Conference on Mathematics Education, aims to enhance the knowledge and skills of Mathematics teachers to produce graduates who are independent and life-long learners. This also acquaint the Mathematics teacher-educators from Teacher Education Institutions (TEIs) with the demands of this teachers in the field so as to align the preparation of pre-service elementary and secondary teachers to equip them with the knowledge and skills expected from them. It aims further to develop a network of Mathematics teachers and School Heads who will work together towards excellence in Mathematics education.

Moreover, DepEd order no. 49, s. 2002 also known as Operationalization of the DepEd and JICA Cooperation on "The Strengthening of Continuing School-based INSET for Science and Mathematics Teachers" aims to upgrade teaching skills and deepen understanding of subject matter content in science and mathematics through school-based inset as part of the overall national development agenda to improve the delivery of quality education particularly science and mathematics education. Furthermore, in the same reference, as embodied an Article VIII Section 2 Code of Ethics for Professional Teachers, a teacher shall recognize that the interest and welfare of learners are his first and foremost concern and shall handle each learner justly and impartially.

Pursuant to Section 17, Article III of Education Act 1982, it states that one of the duties and obligations of a school administrator is to develop and maintain a healthy school atmosphere conducive to the promotion and preservation of academic freedom and effective teaching and learning and in harmonious and progressive school personnel relationship.

Republic Act 7836, Article VIII, Section 9 in Code of Ethics for Professionals' Teachers, states that a teacher shall ensure that conditions to the maximum development of learners and shall extend needed assistance in preventing or solving learner's problem and difficulties.

The (NCTM) National Council of Teachers of Mathematics (2006) as cited by Bayetto (2015), said that effective Mathematics teaching requires understanding what students know and need to learn and then challenging and supporting them to learn it well.

Gross & Rutland, (2017); Specce, (2002) suggested that applying PBL (Problem-Based Learning) would make the students realize that there are differences between theory and practice, learning the theory alone would not be efficient to apply them in social life.

Furthermore, Woodin et al. (2010) examined all aspects of problem solving, it is very important that students learn and apply learning outcomes in order to develop more complex problem-solving skills to a higher level of intelligence. A person can be very intelligent when he can manage the information available to

solve a problem, (Caprioara, 2015). In addition, Prawita et al. (2019) stated that mastery of the problem-solving skills on the concept of materials can be an indicator of good analytical thinking skills and will ultimately influence the academic grades of students.

Moreover, Yeo (2009) found that some students have slow progress in solving problems due to their inability to translate the problem into Mathematical form. According to Rysdon (2010) the greatest reason why students are performing poorly in Mathematics is because they are still having a hard time finding the relevance of Mathematics in their lives.

Many students struggled to accomplish Mathematics especially in problem-solving, Ibrahim (1997); Garderen (2006); Zahrah et al. (2003); Tarzimah (2005); Aziz (2002); Kaufman (2008); Berch & Mazzoxxa (2007). They must be able to solve the problem because problem solving is important for the development of human competencies, Subahan (2007). In real life, students need to solve the problems because that is a basic way to survive in our daily life and Mathematics is seen as the language. The primary and secondary Mathematics curriculum emphasized on arithmetic, problem-solving, communication, manthic-thinking, connection-building and technology application skills (Curriculum Development Centre, Ministry of Education 2003;2001). Furthermore, students should have better problem-solving skills to understand the causal relationship of any biological phenomenon and to master the appropriate scientific reasoning skills for each phenomenon encountered, Asiye & Bilge, (2016).

Moreover, a study conducted by Hill (2008) found that Mathematics skills such as language, number fact, information and arithmetic are vital in problem-solving. Deficiency in any of these skills could cause difficult in Mathematics skills among students.

The study of the educators and psychologists revealed that students will have an effective problem-solving skill not depending on the Bloom's learning theory (Bloom, B.S. and Engelhart, M.D., 1956). According to them, there were three factors influencing students' learning achievement background knowledge and skills, effective domain such as attitude on the subject, school and learning processes, interest, motivation, self-efficacy, self-esteem and teaching quality factors namely; instruction acknowledgement, participation in class activities, teacher's sanction system and giving feedbacks.

In addition, Stendall (2009) stated that the abilities to give good concentration, to make meaningful perceptions, to think logically and to use memory effectively are important factors in learning skills and solving problems. These abilities vary among students.

Belieg (2004) stated that social environment is one of the factors that affects the academic performance of the students. It is a factor in learning based on a natural environment. Physical arrangement, situational, instructional and consistent favourable relationship between the teacher and students will be acquired if the teacher is creative and willing to take steps for its success. As mentioned by Neo et al. (2012) low problem-solving skills can be caused by

learning environments and media that do not allow the maximum use of problem solving.

Withal, Erdem-Keklik, (2013) said that toward effective teaching of problem-solving skills, one of the steps is to develop measurement instruments with well-established validity. In other words, in order to improve students' problem-solving skills, educators should not only determine the degree to which the students have these skills but also pinpoint to specific areas and skills in need of improvement.

Furthermore, Sherman et al. (2005), also cited by Bayetto (2015) reminded that Mathematics instruction must provide many opportunities for concept building, relevant challenging questions, problem solving reasoning, and connections within the curriculum and real-world situations.

According to Corpuz and Salandanan (2013), the principal elements that make teaching and learning possible and attainable are the teacher, the learner, and the conducive learning environment. Only when a positive relationship exists among them came teaching and learning occur with precision and predictability. The teacher serves as the prime mover of the educational wheel while the learner is the key participant in the learning process. The favorable environment provides essential features and ingredients that could make headway in guiding the teaching-learning process and methodologies needed for smooth linkages among the three.

As cited by Tulang et al., (2016) the teacher as facilitator of learning, (1) impart knowledge and provides the conditions for effective learning; (2) seeks to

meet the needs and interest of the learner; (3) helps to create conditions for openness, respect, trust, acceptance, confrontation, and self-evaluation; (4) places emphasis of the uniqueness and rights of the individual; and (5) seeks feedback which will improve his effectiveness as a facilitator of the learning process (Tulang, et al., 2016).

According to Dr. Rita Dunn (2008), Director of International Learning Styles Network: "Students are not failing because of the curriculum. Students can learn any subject matter when they are taught with methods and approaches responsive to their learning styles." Learners respond differently to stimuli. A stimulus that enhances learning for one may obstruct learning for another.

The learning environment as one of the basic components that makes teaching and learning events happen consists of an area where the physical structures are built for purposes of providing academic instruction to children. The various facilities are designed to fit the requirements of the different learning activities. The whole site offers the best opportunities for educating the youth, Salandanan (2012).

According to Pine and Horne in the year 1990, the learning environment consists of the physical, as well as psychological environment, that surrounds the learner and that influences his/her learning, Corpuz and Salandanan (2006).

Bayetto (2015) suggested in her research about students with learning difficulties in Mathematics that educators should: (1) use brief, mini-lessons for specific skills with the whole class or targeted groups; (2) provide opportunities to

work alone and together; (3) use problem solving with divergent questions; (4) use concrete materials; (5) confirm student understanding of Mathematical language; (6) have students keep math journals; (7) play games; (8) use technology; (9) to optimize learning, educators should have a robust pedagogical knowledge and positive attitude; (10) choose published materials carefully; and (11) assessment should support the learning of important Mathematics and furnish useful information to both teachers and students.

Sumampong et al. (2006) in their study on Learning Difficulties in Mathematics concluded that there was a significant relationship between the learning difficulties of the pupils and their academic performance in Mathematics. All the learning difficulties enumerated under pupil, teacher and classroom factors encountered by the respondents slightly affected them. They concluded further that the most pressing learning difficulty that affected the pupils' Mathematics academic performance is the classroom factor.

Another study that supports this query is "Learning Difficulties in Intermediate Algebra in Relation to Student's Academic Performance", Anub et al. (2013), found out that learning difficulties affect students' Mathematical achievement. Furthermore, they recommended that teachers should conduct a diagnostic test at the start of the school year to determine the weak points of the students specifically in their subjects.

The Big Five Model, also known as the Five-Factor Model, is the most widely accepted personality theory held by psychologists today. As stated by Lim A. (2020) the theory states that personality can be boiled down to five core factors:

(1) Conscientiousness describes a person's ability to regulate their impulse control in order to engage in goal-directed behaviors (Grohol, 2019); (2) Agreeableness refers to how people tend to treat relationships with others. Unlike extraversion which consists of the pursuit of relationships, agreeableness focuses on people's orientation and interactions with others (Ackerman, 2017); (3) Extraversion reflects the tendency and intensity to which someone seeks interaction with their environment, particularly socially. It encompasses the comfort and assertiveness levels of people in social situations; (4) Neuroticism describes the overall emotional stability of an individual through how they perceive the world. It takes into account how likely a person is to interpret events as threatening or difficult; (5) Openness to experience refers to one's willingness to try new things as well as engage in imaginative and intellectual activities. It includes the ability to "think outside of the box."

Furthermore, it has been supported by Yu Z. (2021) that personality plays an important role in the learning context. Learners with different personality traits prefer different educational approaches. Some might prefer a face-to-face traditional approach, while others might prefer an online learning approach or blended approach (Bolliger & Erichsen, 2013).

On the other hand, Drennan et al. (2005) stated that, in response to recent technological advances and the trend toward flexible learning in Education, they examined the factors affecting students' satisfaction with flexible online learning.

They identified two key student attributes of student satisfaction: (a) positive perception of technology in terms of ease of access and use of online flexible

learning material and (b) autonomous and innovative learning styles. They derived measures of perceptions of technology from research on the Technology Acceptance Model and used locus of control and innovative attitude as indicators of an autonomous and innovative learning mode.

According to the Commission on Higher Education (CHED), flexible learning “ensures the continuity of inclusive and accessible education when the use of traditional modes of teaching is not feasible, as in the occurrence of national emergencies.”

In the sphere of education according to ECLAC-UNESCO COVID -19 report (2020), as the coronavirus disease (COVID-19) pandemic has caused an unprecedented crises in all areas, many of the region's countries have adopted in response to the crises are related to the suspension of face-to-face classes at all levels, which has given rise to the three main areas of action, a) the learning distance modalities deploys various formats and platforms (with or without the use of technology) b) the support and mobilization of education personnel and communities c) and deep concern for the health and welfare of the students.

On the other hand, distance learning attempts to engage students in an active learning environment (Bhagat, et al. (2016). Today, most Universities utilized varieties of methods in delivering material to their students. Distance Learning which is now the new norms of educating young dreamers provide accessible education to all and impart the most effective strategies in the teaching learning process. Moreover, (Anderson, 2008; Dilbeck, 2008) introduced discovery learning where students practice and understand the concepts of self-learning,

individual learning and full access to instruction.

Furthermore, Abdous & Yoshimura (2010) emphasized that it is essential to assess the effectiveness of different distance learning delivery methods in terms of overall students' performance and satisfaction. Moreover, in distance learning teachers should understand how students are affected by exposure to different delivery methods in a technological learning environment. Naai, et al. (2011) strengthen the connection and emphasized the relationship between students' learning outcome and the different methods of distance learning.

Moreover, De Vera (2020) said that Universities and colleges have the freedom to choose what mode would be effective for them. He stressed the three modes of flexible learning these are: (a) Online, a flexible learning mode which is electronic-based, and which uses available online classrooms for the delivery of instruction; (b) Offline, this does not use internet connectivity at all; (c) Blended, it is a combination of online and offline modes.

The theoretical-conceptual framework of the study is presented in Figure 1 on the next page. The study is anchored on the theories and legal bases that support the study and the students learning difficulties in terms of teachers, students, and flexible learning. In addition, the figure illustrates the profile of the respondent and the personality types of the students in the new normal education and the proposed action plan based from the findings of the study that may help teachers to find solution to the learning difficulties met by the students.

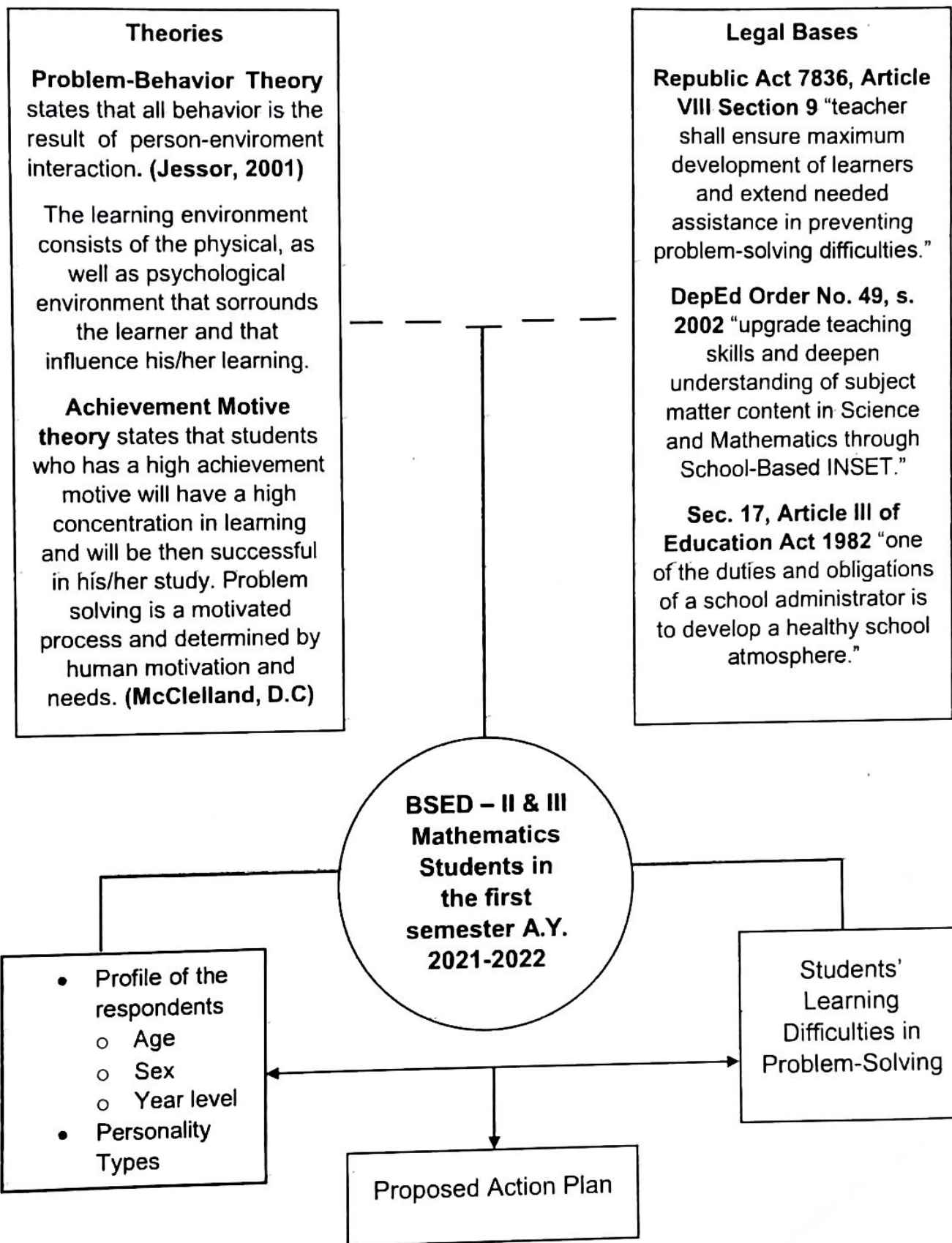


Figure 1. Theoretical - Conceptual Framework of the Study

THE PROBLEM

Statement of the Problem

The main thrust of this study was to determine if age, sex, year level and personality types are predictors of students' difficulties in problem-solving in the new normal education among all Second Year and Third Year Bachelor of Secondary Education Major in Mathematics students of Bohol Island State University – Bilar Campus, A.Y. 2021-2022.

Specifically, this study sought to answer the following questions:

1. What is the profile of the respondents in terms of:
 - 1.1 age;
 - 1.2 sex; and
 - 1.3 number of students per year level?

2. What is the personality types of the students in terms of the Big Five Personality Inventory in the areas of:
 - 2.1 Extraversion;
 - 2.2 Agreeableness;
 - 2.3 Conscientiousness;
 - 2.4 Neuroticism; and
 - 2.5 Openness?

3. What is the level of difficulty of the students' difficulties in problem-solving in the new normal education related to:

3.1 teacher factor;

3.2 student factor; and

3.3 flexible learning factor?

4. Are age, sex, year level and personality types predictors of students' difficulties in problem-solving?

5. What action plan can be proposed based on the findings of the study?

Null Hypothesis

Age, gender, year level and personality types are not predictors of students' difficulties in problem-solving.

Significance of the Study

The study was conducted to know if age, sex, number of students per year level and personality types of the students are predictors of students' difficulties in problem-solving in the new normal education.

The result of this study would be beneficial to the following:

Students. This study would help them evaluate their mathematical learning difficulties in problem solving and will encourage them to find solutions, develop learning styles and spend more time studying Mathematical concepts.

Teachers. This study would guide and motivate the teachers in improving their teaching designs, methods, approaches, strategies and techniques. This would encourage the teachers to look for possible interventions, such as, providing environment that support learning and facilitate students in overcoming these difficulties that will help them learn Mathematics more effectively.

Administrators. This study would give a view to the school administrators /school officials the significance of looking deeper into the innate qualities and abilities of the teachers who can handle both regular and special classes, especially in distance learning in the new normal which is adapted by schools and universities adapted today.

Parents. This would provide them an understanding why their children perform low in school most specifically in learning Mathematics. It will help them know how these corresponding factors affect the different learning difficulties of their children; thus, be able to help their children study at home and overcome these learning difficulties.

Future Researchers. This study would help the future researchers in conducting research, as well as they could improve this study by finding other predictions that affect student's difficulties in problem solving.

RESEARCH METHODOLOGY

Design

The researchers employed a descriptive-survey research design to achieve the objective of the study. It is a type of research design that describes the population, situation, phenomenon that is being studied. The goal of a descriptive research is to “describe” a certain phenomenon or event and its characteristics from a certain sample of a population (Nassaji, 2015). A descriptive design provides a profile of relevant concepts of a phenomenon from an individual, organization, on industry perspective (Sileyew, 2019). Since researchers intend to analyze a certain phenomenon, then the descriptive research design is appropriate for this study.

Through questionnaires the researchers assess the factors that affect the learning difficulties of the respondents in problem solving in terms of teacher, student and flexible learning among Bachelor of Secondary Education Major in Mathematics II and III students of Bohol Island State University Bilar-Campus.

Environment and Participants

The study was conducted at Bohol Island State University – Bilar Campus. It was formerly known as BAC (Bohol Agricultural College) until it was converted into CVSCAFT (Central Visayas State College of Agriculture, Forestry and Technology) and finally it turned up into Bohol Island State University (BISU) on October 14, 2009 by virtue of Republic Act No. 9722. It is a green university which offers lots of opportunities and provide higher quality of education.

The researchers chose the said institution in order to give remedies to the learning difficulties in problem-solving met by the student. This institution is located at Zamora, Bilar, Bohol which is 3 kilometers from the town proper.

Complete enumeration was used in getting the 66 total respondents of the study. There were 34 Second Year, and 32 Third Year Bachelor of Secondary Education Major in Mathematics students of Bohol Island State University Bilar-Campus, A.Y. 2021-2022.

The researchers chose the aforementioned respondents who are suitable for the study being enrolled in Mathematics discipline and are considered as direct beneficiaries.

YEAR LEVEL	FREQUENCY
Second Year	34
Third Year	32
Total Respondents	66

Instrument

The researchers used a modified survey questionnaire from the study conducted of Reyes, N. et al. (2016) which entitled "Mathematics Difficulties and Academic Performance in Mathematics" to gather the data. It consisted of three (3) parts, namely – the first part was on the personal profile of the respondents, and the second part was on the personality types of the students which the researchers got if from "The Big Five Trait Taxonomy: History, measurement and theoretical perspective" John, O.P., & Srivastara, S. (1999), and the last part was the factors affecting students' difficulties in problem-solving in terms of: (a) teachers; (b) student; and (c) flexible learning.

An indicator was provided to determine the level of difficulty of students' difficulties in problem-solving and the personality types of the students, 1 – Strongly Disagree if the problem is never experienced, 2 – Disagree if the problem is rarely experienced, 3 – Neutral if the problem is sometimes experienced, 4 – Agree if the problem is often experienced, 5 – Strongly Agree if the problem is always experienced.

The result of the *Big Five Personality Types* of the students was interpreted using the following scale:

Scoring: BFI scale scoring ("R" denotes reverse-scored items):

<i>Extraversion:</i>	1, 6R, 11, 16, 21R, 26, 31R, 36
<i>Agreeableness:</i>	2R, 7, 12R, 17, 22, 27R, 32, 37R,
<i>Conscientiousness:</i>	3, 8R, 13, 18R, 23R, 28, 33, 38,
<i>Neuroticism:</i>	4, 9R, 14, 19, 24R, 29, 34R, 39
<i>Openness:</i>	5, 10, 15, 20, 25, 30, 35R, 40, 41R,

The questionnaire undergone a pilot testing at Bohol Island State University-Bilar Campus, specifically to Bachelor of Science in Agricultural and Biosystem Engineering (BSABE) students to test the reliability and internal consistency of the research instrument tool.

The researchers used Cronbach's Alpha for the instrument's validation. The responses of the respondents were used to validate and improve the instrument/tool. The following were the results of Cronbach's Alpha for every part of the questionnaire:

Questionnaire	Cronbach's Alpha
Personality Types	0.792
Teacher factor	0.962
Student factor	0.873
Flexible learning factor	0.833

With what is reflected above, it can be seen that the Cronbach's Alpha for every questionnaire is greater than 0.7. Therefore, there was an acceptable internal consistency of the questionnaire.

As soon as the result of the pilot test was integrated, the final circulation and distribution of the summary questionnaire to the respondents was done.

Data Gathering Procedures

The researchers conducted a pre-test before conducting the study. The research instrument tool was pretested to the Bachelor of Science in Agricultural and Biosystem Engineering students of Bohol Island State University-Bilar Campus. Request permission was sent to the Dean of the College of Agriculture Engineering and to the Chairperson of BSABE before the questionnaire was pretested. To ensure the safety and security of the students in conducting a pre-test, the researchers used a Google Forms as the alternative way in this new normal education. Safety protocols and measures were followed and prioritized.

After conducting the pre-test and the validation of the instrument, the researchers secured first the official permission from the Dean of the College of Education before conducting the study. Permission from the Campus Director was secured also in conducting the research and asked for the availability of the students. Request permission was sent to the respondents to secure their full cooperation at their most convenient time. The test questionnaires were administered through means of Google Forms since the researchers are strictly prohibited to enter in the campus due to the pandemic and should follow the safety

protocols and rules implemented in this new normal education.

The respondents were encouraged to ask clarifying questions if they find something confusing from the questionnaire through online. They were given for at least an hour to answer the questionnaire. The gathered data undergone systematic procedures of processing to ensure validity and reliability.

A statistical tool was used in treating the data using SPSS. Simple Percentage formula, Weighted Mean Score, Big Five Personality Inventory scoring scale, and Multiple Regression were used to treat the gathered data.

Statistical Treatment

The simple percentage was used to describe the demographic profile of the students.

$$P = \frac{f}{n} \times 100\%$$

Where:

P= percentage
f= frequency
n= number of cases

To get the quantitative data of the level of difficulty of students' difficulties in problem-solving and the personality types of the students, the weighted mean was computed using the formula below:

$$WMS = \frac{1(SDf) + 2(Df) + 3(Nf) + 4(Af) + 5(SAf)}{N}$$

N

Where:

WMS – Weighted Mean Score
N – Total Number of respondents

SDf – Frequency of Strongly Disagree
Df – Frequency of Disagree
Nf - Frequency of Neutral
Af – Frequency of Agree
SAf – Frequency of Strongly Agree

In the personality types of the students, these are the Big five personality inventory scale scoring (“R” denotes reverse-scored items):

Scoring:

Extraversion: 1, 6R, 11, 16, 21R, 26, 31R, 36
Agreeableness: 2R, 7, 12R, 17, 22, 27R, 32, 37R,
Conscientiousness: 3, 8R, 13, 18R, 23R, 28, 33, 38,
Neuroticism: 4, 9R, 14, 19, 24R, 29, 34R, 39
Openness: 5, 10, 15, 20, 25, 30, 35R, 40, 41R

To interpret the Weighted Mean Score, the following indicators were formulated:

Range	Response Category	Descriptive Interpretation
4.21 – 5.00	Strongly Agree	Very High
3.41 – 4.20	Agree	High
2.61 – 3.40	Neutral	Moderate
1.81 – 2.60	Disagree	Low
1.00 – 1.80	Strongly Disagree	Very Low

And to analyze the predictors of students’ difficulties in problem-solving, the Multiple Regression was used.

$$Y_i = B_0 + B_1 X_{1i} + B_2 X_{2i} + B_k X_{ki} + \epsilon_i$$

where:

Y_i = i th observation of the Students’ Learning Difficulties in Problem-solving
 X_j = i is the profile and personality types of the students
 X_{ji} = i th observation of the j th profile and personality types of the student
 B_0 = intercept term
 B_j = slope coefficient for each of the profile and personality types of the student
 ϵ_i = error term for the i th observation
 n = number of observations
 k = number of the profile and personality types of the student

DEFINITION OF TERMS

To facilitate the readers understanding of the content of the research, some of the following terms were identified and defined operationally.

Agreeableness. It refers to the personality dimension which most strongly related to trust versus the critical evaluation of information.

Conscientiousness. It refers to the personality dimension most strongly related to effort in information seeking and perseverance.

Extraversion. It refers to the personality dimension which strongly related to interpersonal information seeking.

Flexible Learning Factor. It refers to the online education or modular learning method affecting the students difficulties in problem-solving.

Learning Difficulties. This refers to the factors that affect students' difficulties in problem-solving in terms of teacher, students and flexible learning factors.

Level of Difficulty. This refers to the level of the learning difficulties met by the students.

Neuroticism. It refers to the personality dimension which is characterized by sadness, moodiness, and emotionally instability.

New Normal Education. It refers to the new normal way of teaching; online, offline and the combination of online and offline. (Flexible Learning)



Openness. It refers to the personality dimension which is related to exploration and joy of discovery.

Problem-Solving. It refers to an area of learning Mathematics.

Respondents. It refers to the Second Year, and Third Year Bachelor of Secondary Education major in Mathematics students of Bohol Island State University – Bilar Campus.

Student Factor. It refers to the behavior of the students affecting their learning difficulties in problem-solving.

Teacher Factor. It refers to the teacher's personal and professional competence affecting the students' difficulties in problem solving.

Chapter 2

PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

This chapter presents the findings, analysis and interpretation of the study. It presents the profile of the respondents in terms of age, sex, and year level. It includes the personality types of the respondents in terms of; extraversion, agreeableness, conscientiousness, neuroticism, and openness; level of difficulty of students' learning difficulties in the problem-solving in terms of teacher factor, student factor, and flexible learning factor; and analysis on the predictors between the profile of the respondents, personality types and students' learning difficulties of all 2nd year and 3rd year BSEd Mathematics students of Bohol Island State University Bilar Campus A.Y. 2021-2022.

Table 1 presents the profile of the respondents of the Mathematics students of Bohol Island State University- Bilar Campus.

Age. The result showed that most of the respondents were 20 years old composed of 23 (34.85%) of the respondents.

Sex. In terms of sex, out of 66 students, 48 (72.73%) were female and 18 or (27.27%) were male.

Year level. There were 34 (51.52%) second year students and 32 or (48.48%) third year student.

Table 1
Profile of the respondents
N=66

Category	Frequency	Percentage (%)
Age		
19	20	30.30 %
20	23	34.85 %
21	13	19.70 %
22	5	7.58 %
23	1	1.52 %
25	2	3.03 %
30	1	1.52 %
34	1	1.52 %
Total	66	100 %
Sex		
Male	18	27.27 %
Female	48	72.73 %
Total	66	100 %
Year Level		
2 nd	34	51.52 %
3 rd	32	48.48 %
Total	66	100%

Table 2.1 shows an item inventory that measures an individual on the Big Five Factors (dimensions) of personality (Goldberg, 1993) associated with self-rated Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness that reveals the personality types of the respondents.

Extraversion. It is strongly related to interpersonal information seeking. Base on the result, in statement 36 mostly they admit that they see their selves "*Get easily nervous*" with a weighted mean of 3.91 interpreted as "*Agree*". However, statement 6 "*is renewed*" got a weighted mean of 2.42 described as "*Disagree*". Among the personality dimensions, it has the lowest result with an overall weighted mean of 3.22 which was interpreted as "*Moderate*". Thus, they are neutrally extraverted which means a person who possess this kind of personality can socialize properly and willingly but in a moderate way.

The result is supported by the study of Diener & Lucas (2022) found that when personality psychologists traits like Extraversion, most people score somewhere in the middle, with smaller numbers indicating more extreme levels.

Table 2.1
Personality Types of the Students in terms of Extraversion
N= 66

BIG FIVE PERSONALITY INVENTORY				
	Item No.	W.M	R.C	Rank
EXTRAVERSION	I see myself as someone who ...			
	1. Is talkative	3.26	Neutral	5
	6. Is renewed	2.42	Disagree	8
	11. Is full of energy	3.53	Agree	4
	16. Generates a lot of enthusiasm	3.67	Agree	3
	21. Is emotionally stable, not easily upset	2.61	Neutral	6
	26. Can be moody	3.83	Agree	2
	31. Remains calm in tense situations	2.50	Disagree	7
	36. Gets nervous easily	3.91	Agree	1
	Composite Mean	3.22	Moderate	

Source: John, O.P., & Srivastava, S. (1999). The Big-Five trait taxonomy: History, measurement and, theoretical perspective. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research* (Vol.2, pp. 102 – 138). New York: Guilford Press.

Legend:

Parameters	Response Category	Interpretation
4.21 – 5.00	Strongly Agree	Very High
3.41 – 4.20	Agree	High
2.61 – 3.40	Neutral	Moderate
1.81 – 2.60	Disagree	Low
1.00– 1.80	Strongly Disagree	Very Low

Table 2.2 presents the agreeableness personality dimension which most strongly related to trust versus the critical evaluation of information.

Agreeableness. It was revealed that the students have low assentation in the statement 37 "*Likes to reflect, play with ideas*" with a weighted mean of 1.94 with a response category of "*Disagree*". However, there were top 2 of the personality types of the students in terms of agreeableness, "*Is helpful and unselfish with others*" and "*Has a forgiving nature*" that have the same weighted mean of 4.18 with a response category of "*Agree*". In general, Agreeableness had

a composite mean of 3.45 with a descriptive interpretation of "High". This means that they are open minded and tend to get tremendous pleasure from serving others and taking care of them.

As a support in the result, Cherry K. (2021) stated that when the agreeableness level is high it means that they has a great deal of interest in other people, cares about others, feels empathy and concern for other people, enjoys helping and contributing to the happiness of other people and able to assist others who are in need of help.

Table 2.2
Personality Types of the Students in terms of Agreeableness
N=66

BIG FIVE PERSONALITY INVENTORY				
	Item No.	W.M	R.C	Rank
AGREEABLENESS	2. Tends to find fault with others	3.98	Agree	2
	7. Is helpful and unselfish with others	4.18	Agree	1
	12. Starts quarrels with others	3.94	Agree	4
	17. Has a forgiving nature	4.18	Agree	1
	22. Is inventive	3.42	Agree	5
	27. Values, artistic, aesthetic experiences	1.98	Disagree	6
	32. Prefers work that is routine	3.95	Agree	3
	37. Likes to reflect, play with ideas	1.94	Disagree	7
	Composite Mean	3.45	High	

Source: John, O.P., & Srivastava, S. (1999). The Big-Five trait taxonomy: History, measurement and, theoretical perspective. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research* (Vol.2, pp. 102 – 138). New York: Guilford Press.

Legend:

Parameters	Response Category	Interpretation
4.21 – 5.00	Strongly Agree	Very High
3.41 – 4.20	Agree	High
2.61 – 3.40	Neutral	Moderate
1.81 – 2.60	Disagree	Low
1.00– 1.80	Strongly Disagree	Very Low

Table 2.3 shows the conscientiousness personality dimension most strongly related to effort in information seeking and perseverance.

Conscientiousness. It was shown in the table that in statement 13 "Is

reliable worker" got a highest weighted mean of 4.02 with a response category of "Agree". On the other hand, statement 8 "*Can be somewhat careless*" got a lowest weighted mean of 2.62 with a response category of "*Neutral*". It showed that they are driven and hardworking and able to set a comfortable balance between work and fun.

According to Gordon S. (2021) everyone has a certain level of conscientiousness that exist on a scale. As a result, people tend to be very conscientious, very low, or somewhere in between, which measured using an inventory and regarded a personality dimension making it difficult to establish the prevalence of conscientiousness among the general public.

Table 2.3
Personality Types of the Students in terms of Conscientiousness
N=66

BIG FIVE PERSONALITY INVENTORY				
	Item No.	W.M	R.C	Rank
CONSCIENTIOUSNESS	3. Does a thorough job	3.48	Agree	5
	8. Can be somewhat careless	2.62	Neutral	8
	13. Is a reliable worker	4.02	Agree	1
	18. Tends to be disorganized	3.18	Neutral	6
	23. Has an assertive personality	2.64	Neutral	7
	28. Is sometimes shy, inhibited	3.89	Agree	2
	33. is outgoing, sociable	3.53	Agree	4
	38. Has a few artistic interests	3.65	Agree	3
	Composite Mean	3.38	Moderate	

Source: John, O.P., & Srivastava, S. (1999). The Big-Five trait taxonomy: History, measurement and, theoretical perspective. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research* (Vol.2, pp. 102 – 138). New York: Guilford Press.

Legend:

Parameters	Response Category	Interpretation
4.21 – 5.00	Strongly Agree	Very High
3.41 – 4.20	Agree	High
2.61 – 3.40	Neutral	Moderate
1.81 – 2.60	Disagree	Low
1.00– 1.80	Strongly Disagree	Very Low

Table 2.4 presents the neuroticism personality dimension whose characterized by sadness, moodiness, and emotional instability.

Neuroticism. Among the personality types of the students, it has the highest composite mean of 3.52 which was interpreted as "High". It reflects in the result that in statement 9 "*Neutrally relaxed, handle stress well*" and statement 24 "*Can be cold and aloof*" had a weighted mean of 2.79 and 2.89 with a response category of "neutral" respectively, which was positioned in the lowest rank. However, in statement 39 "Likes to cooperate with others" got a highest weighted mean of 4.35 with a response category of "Strongly Agree". The result of the study strongly suggest that neuroticism is more sensitive to threat. They tend to be not confident and unstable.

According by Cherry K. (2021) individuals who are high in this trait, trend to experience mood swings, anxiety, irritability, and sadness. This finding is supported by the study of kwon S. (2007) highly neurotic individuals tend to be labile anxious, tense and withdrawn.

Table 2.4
Personality Types of the Students in terms of Neuroticism
N=66

BIG FIVE PERSONALITY INVENTORY				
	Item No.	W.M	R.C	Rank
NEUROTICISM	4. Is depressed, blue	3.06	Neutral	6
	9. Is relaxed, handle stress well	2.79	Neutral	8
	14. Can be tense	3.47	Agree	4
	19. Worries a lot	4.02	Agree	3
	24. Can be cold and aloof	2.89	Neutral	7
	29. Is considerate and kind to almost everyone	4.29	Strongly Agree	2
	34. Is sometimes rude to others	3.32	Neutral	5
	39. Likes to cooperate with others	4.35	Strongly Agree	1
	Composite Mean	3.52	High	

Source: John, O.P., & Srivastava, S. (1999). The Big-Five trait taxonomy: History, measurement and theoretical perspective. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research* (Vol.2, pp. 102 – 139). New York: Guilford Press.

Legend:

Parameters	Response Category	Interpretation
4.21 – 5.00	Strongly Agree	Very High
3.41 – 4.20	Agree	High
2.61 – 3.40	Neutral	Moderate
1.81 – 2.60	Disagree	Low
1.00 – 1.80	Strongly Disagree	Very Low

Table 2.5 presents the openness personality dimension who's related to exploration and joy of discovery.

Openness. It was revealed that in statement 10 "*Is curious about many different things*" got a highest weighted mean of 4.35 with a response category of "Strongly Agree". However, it was reflected on the table that in statement 35 "*Make plans and follows through with them*" positioned in the lowest rank with a weighted mean of 2.08 with a response category of "Disagree". Generally, it has a composite mean of 3.46 which was interpreted as "High". This means that they tend to be open-minded, more willing to embrace new things, fresh ideas and novel experiences.

The result of the study based on the students' behavior on this trait is supported by Heinstrom J. (2010) that open persons tend to be curious, enjoy trying new things, and have a wide range of interests, including cultural ones. They are typically liberal, drawn to the unexpected, welcoming of cognitive challenges and questioning of old notions, Costa and McCrae (1992).

Table 2.5
Personality Types of the Students in terms of Openness
N=66

BIG FIVE PERSONALITY INVENTORY				
	Item No.	W.M	R.C	Rank
OPENNESS	5. Is original, come up with new ideas	3.70	Agree	4
	10. Is curious about many different things	4.35	Strongly Agree	1
	15. Is ingenious, a deep thinker	3.62	Agree	5
	20. Tends to be lazy	3.41	Agree	7
	25. Perseveres until the task is finished	3.97	Agree	2
	30. Does thing efficiently	3.88	Agree	3
	35. Make plans and follows through with them	2.08	Disagree	9
	40. Is easily distracted	3.50	Agree	6
	41. Is sophisticated in art, music, or literature	2.64	Neutral	8
		Composite Mean	3.46	High
	General Average	3.40	Moderate	

Source: John, O.P., & Srivastha, S. (1999). The Big-Five trait taxonomy: History, measurement and, theoretical perspective. In L. A. Pervin & D. P. John (Eds.), *Handbook of personality: Theory and research* (Vol.2, pp. 102 – 138). New York: Guilford Press.

Legend:

Parameters	Response Category	Interpretation
4.21 – 5.00	Strongly Agree	Very High
3.41 – 4.20	Agree	High
2.61 – 3.40	Neutral	Moderate
1.81 – 2.60	Disagree	Low
1.00– 1.80	Strongly Disagree	Very Low

Table 2.6 presents the overall composite mean of each personality types of the student which includes, Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness.

Generally, the personality types of the students are moderately described in the result with a general average weighted mean of 3.40. The result revealed that the respondents are moderately extraverted, moderately conscientious but more agreeable, more open to experience and more neurotic. As psychologists stated it is possible that person with moderate level of [five-factor analysis] traits will be better work and life outcomes.

Table 2.6
Overall Composite Mean of Each Personality Types of the Student
N=66

Personality Type	Composite Mean	Interpretation	Rank
Extraversion	3.22	Moderate	5
Agreeableness	3.45	High	3
Conscientiousness	3.38	Moderate	4
Neuroticism	3.52	High	1
Openness	3.46	High	2
General Average	3.40	Moderate	

Legend:

Parameters	Response Category	Interpretation
4.21 – 5.00	Strongly Agree	Very High
3.41 – 4.20	Agree	High
2.61 – 3.40	Neutral	Moderate
1.81 – 2.60	Disagree	Low
1.00– 1.80	Strongly Disagree	Very Low

Table 3 reveals the level of difficulty of the students' difficulties in problem-solving in the new normal education in terms of Teacher, Student, and Flexible Learning factors.

Teacher Factor. Among the learning difficulties in problem-solving met by the students in the teacher factor, *a teacher who does not report to the class regularly and on time* with a weighted mean of 2.92 which is "neutral" is the most felt by the students. However, *teacher who does not encourage class participation and critical thinking* with a weighted mean of 2.41 which is "Disagree" is less felt by the students and has the lowest value of interpretation in the teacher factor.

Generally, the average weighted mean score was 2.66 with a descriptive interpretation of "Moderate". This means that the learning difficulties in problem-solving met by the students in the teacher factor moderately affect their performance.

This finding is supported by the study of Sumampong, et al. (2006) which revealed that teachers can slightly affect and influence students' performance.

Also, in the study of Archaya (2017) revealed that teachers who has lack of regular assessment of school and lack linkage between new mathematical concept can affect the performance of the student and the main cause of difficulties in learning Mathematics.

Student Factor. The most felt learning difficulty of the students *is personal problem (eg. family, financially, etc.)* with a weighted mean of 3.56 with a response category of "Neutral". However, *abseentism/cutting of classes* is less felt by the students with a weighted mean of 1.97 with a response category of "Disagree". Most of the difficulties met by the students in problem-solving in student factor have the same response category of "Neutral" except only for *abseentism/cutting classes* which is "Disagree". In general, the average weighted mean score was 3.03 with a descriptive interpretation of "Moderate".

The result is supported by the study of Kpolouie, et al. (2014) asserted that students' attitude to school and their interest in learning influence their academic performance. In addition, Manoah et al. (2011) confirmed that in the case of Mathematics, students' attitude towards the subject has a direct impact on their academic performance. Also, the result is supported by Belieg (2004) which mentioned that social environment is one of the factors that can affect the academic performance of the students.

Flexible Learning Factor. The item that is most felt by the students in flexible learning factor is *"unstable internet connection"* with a weighted mean score of 3.98 with a response category of "Agree". However, there were top two of the learning difficulty in flexible learning factor that have the same response category

of "Neutral" while most of the other difficulties have the same response category of "Agree". *"I am not able to actively communicate online via email or discussion and I am not able to set goals and deadlines for myself"* with a weighted mean of 3.36 and 3.08 with a response category of "Neutral", respectively. In general, the weighted mean average score was 3.57 with a descriptive interpretation of "High". It showed that students really have a hard times and difficulties in this new normal education.

The result of the study is supported by Fabito, et al. (2020) revealed that one of the three barriers and challenges that students encountered in online learning was a poor internet connection. In connect with the empirical studies (Adedotun, 2015; Akonde and Bamise, 2017) reported that access to information can influence academic performance of the students. In addition, the result also supported with findings of Chung, et al. (2020) wherein internet connection is one of the great challenges of learning online among students.

Generally, the teacher, student, and flexible learning factors got a general average of 3.09 with a descriptive interpretation of "Moderate". This means that the learning difficulties met by the students in problem-solving moderately affect their academic performance.

Table 3
Level of Difficulty of Students' Difficulties in Problem-Solving
N=66

Learning Difficulties	W.M	R.C	Rank
A. Teacher Factor			
1. Insufficient knowledge of the subject matter	2.79	N	3
2. Lack of Teaching Strategies	2.77	N	4
3. Does not have mastery in delivering the lesson	2.52	DA	8
4. Does not clarify ideas in answer to student's questions regarding the lesson	2.88	N	2
5. Does not presents ideas or concepts in a clear and understandable manner	2.70	N	6
6. Does not give examples and challenging questions or problems for discussion	2.58	DA	7
7. Does not introduce the lesson with stimulating ideas about the subject	2.48	DA	9
8. Does not demonstrate concern of students with poor performance	2.88	N	2
9. Does not use appropriate instructional material	2.48	DA	9
10. Does not encourage class participation and critical thinking	2.41	DA	10
11. Does not guide students to accomplish learning goals	2.52	DA	8
12. Is not open minded and not approachable	2.71	N	5
13. Does not report to class on time and regularly	2.92	N	1
Composite Mean	2.66	M	
B. Student Factor			
1. Lack of interest on Problem Solving	2.91	N	9
2. Easily get bored when it comes to problem solving	2.88	N	10
3. Unable to cope up with the teacher's discussion	2.88	N	10
4. Unable to understand without the teacher's discus	3.35	N	3
5. Lack of motivation	3.06	N	7
6. Unable to recall the previous lesson	2.94	N	8
7. Having a hard time in understanding the given problems	3.21	N	5
8. Unable to understand the given example without further explanation	3.39	N	2
9. Personal problems (e.g. family, financially, etc.)	3.56	N	1
10. Health	2.76	N	11
11. Absentism/Cutting Classes	1.97	DA	12
12. Self-doubt	3.33	N	4
13. Insufficient knowledge	3.18	N	6
Composite Mean	3.03	M	
C. Flexible Learning Factor			
1. I have no access a reliable internet connection	3.56	A	5
2. I could not communicate actively online via email or discussion	3.36	N	8
3. I could not able to dedicate at least 46 hours per week, per online course	3.41	A	7
4. I could not able to set goals and deadlines for myself	3.08	N	9
5. I have unstable internet connection	3.98	A	1
6. I do not conducive learning environment	3.55	A	6
7. I am not totally convinced that I will get the same value of education from an online course	3.74	A	3
8. I can not easily understand concept notes and examples	3.55	A	6
9. I lack educational resources	3.65	A	4
10. I do not have internet load	3.86	A	2
Composite Mean	3.57	H	
General Average	3.09	M	

Legend:

Parameters	Response Category	Interpretation
4.21 – 5.00	Strongly Agree (SA)	Very High (VH)
3.41 – 4.20	Agree (A)	High (H)
2.61 – 3.40	Neutral (N)	Moderate (M)
1.81 – 2.60	Disagree (DA)	Low (L)
1.00– 1.80	Strongly Disagree (SD)	Very Low (VL)

Table 4 presents the predictors of students' learning difficulties in problem solving. It revealed that the profile of the respondents in terms of age, sex, and year level are not predictors of students' learning difficulties in the problem-solving with the p-value of 0.183, 0.453, and 0.674, respectively, which is greater than 0.05 level of significance. With this, the result showed that age, sex, and year level did not affect students' learning difficulties in problem-solving.

In the study of Abubakar and Bada (2014), they found out that age and gender were not predictors in the academic performance and learning difficulties of the students in Mathematics. It was suggested that some variables must be included so as to determine significant contributory effect of students' academic achievement of Mathematics students.

However, this might argue to the result of the study which found that age, sex, and year level have significant effects to the academic performance of the students (Khan, Igbal & Tasneem, 2015; Echete, 2014).

Table 4
Predictors of Students' Learning Difficulties in Problem-Solving
N=66

Model	Unstandardized Coefficient		Standardized Coefficient	T	P-value	Remarks
	B	Std. Error	Beta			
(Constant)	2.428	1.415		1.715	0.091	Not predictors
Year level	0.075	0.177	0.058	0.423	0.674	
Age	0.05	0.037	0.188	1.346	0.183	
Sex	-0.089	0.182	-0.095	-0.300	0.453	

*Significant at $p < 0.05$
Dependent Variables: Students' difficulties in Problem-Solving (SDPS)

Table 5 presents the predictors of students' learning difficulties in problem solving in the personality type of the students. It showed that extraversion,

agreeableness, neuroticism, and openness are not predictors of student learning difficulties in problem-solving with the p-value of 0.225, 0.185, 0.146, and 0.062, respectively, which is greater than 0.05 level of significance.

However, among the personality type of the students, conscientiousness revealed as a predictors of the students' learning difficulties in problem-solving with the p-value of 0.034, which is lesser than 0.05 level of significance. By using the regression model, it revealed that the lower the conscientiousness, the higher the learning difficulties met by the students.

The result of this study is supported by the study of D'Zurilla et al. (2011) revealed that conscientiousness was associated with higher problem-solving ability. In addition, it has been argued that conscientiousness is not always a good predictor of the performance of the students (Palmon, R. et al., 2009). Conrad N. and Patry M. (2012) presents a study supported through prior research that conscientiousness is a critical factor with regard to academic performance. Furthermore, the present study indicates that the effects of conscientiousness on academic performance are indirect.

Table 5
Predictors of Students' Learning Difficulties in Problem-Solving in terms
of Personality Types
N=66

Model	Unstandardized Coefficient		Standardized Coefficient	T	P-value	Remarks
	B	Std. Error	Beta			
(Constant)	2.428	1.415		1.715	0.091	
Extraversion	-0.397	0.294	-0.483	-1.353	0.225	Not predictor
Agreeableness	0.280	0.187	0.521	1.495	0.185	Not predictor
Conscientiousness	-0.719	0.263	-0.745	-2.737	0.034	Predictor
Neuroticism	-0.461	0.276	-0.564	-1.671	0.146	Not predictor
Openness	0.694	0.303	0.683	2.290	0.062	Not predictor

*Significant at $p < 0.05$
Dependent Variables: Students' difficulties in Problem-Solving (SDPS')

Chapter 3

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

This chapter deals with the summary of findings, the conclusions drawn and the recommendations based on the analysis of the data gathered. The outcomes of the study were the bases for teaching design to improve the students' performance in Mathematics.

Summary of findings

The main thrust of this study was to determine if age, sex, year level and personality types are predictors of students' difficulties in problem-solving in the new normal education among all Second Year and Third Year Bachelor of Secondary Education Major in Mathematics students of Bohol Island State University – Bilar Campus, A.Y. 2021-2022.

Based on the thorough analysis on the data of the study, the researchers came up with the following findings:

1. Profile of the Respondents

Most of the respondents were 20 years old, most of them were females and second year students.

2. Personality Types of the Students

The personality of the students was classified in a moderate level. The result revealed that the respondents was moderately extraverted, moderately conscientious but more agreeable, more open to experience and more neurotic.

3. Level of Difficulty of the Students' Learning Difficulties in Problem-Solving

The results revealed that the level of difficulty of the students' learning difficulties in problem-solving was moderately experienced. Mostly, a teacher who does not report to the class regularly and on time, moderately affect students in the teacher factor. On the other hand, the most felt learning difficulty factors of the students is personal problems (e.g. family, financially and etc.), as well as, in the flexible learning factor, unstable internet connection is highly concerned and drastically affect the students.

4. Significant predictors of students' learning difficulties in problem-solving

It was found out that age, sex, year level are not predictors of students' difficulties in problem-solving. Among the personality types, only conscientiousness revealed as a predictor of student difficulties in problem-solving.

Conclusion

Based on the results, the following conclusions were drawn:

The findings revealed that age, sex, and year level are not predictors of students' difficulties in problem-solving. However, among the personality types of the students, only conscientiousness revealed as a predictor. It means that the lower the conscientiousness level, the higher the learning difficulties in problem-solving met by the students. When it comes to age, it shows does not matter to the learning difficulties of the students in problem-solving as well as, year level.

learning difficulties of the students in problem-solving as well as, year level. In terms of sex, it does not mean that female has a higher level of comprehension in problem-solving than male and vice versa.

The learning difficulties that affect the students the most include teacher who does not report to the class regularly and on time, personal problems (e.g. family, financially and etc.), and unstable internet connection in terms of teacher, student, and flexible learning factors, respectively.

Generally, the result implied that the more the students exert some efforts on their studies, the easier they can handle their learning difficulties. Thus, this means that only their determination and hardship in studying could tell how they can make their study habits even easier most especially in problem-solving. It is in connection with the theory which is "Achievement Motive Theory" stated that students who has a high achievement motive will have a high concentration in learning and will be then successful in his/her study.

Recommendation

Anchored on the aforementioned findings and conclusions, the following recommendations are offered:

1. Since the result of the study revealed that the profile and personality types which include extraversion, agreeableness, neuroticism, and openness of the respondents are not predictors and the learning difficulties of the students are moderately affect their academic performance, but still, it should have a collaborative learning and effort between the teacher and the student to improve

their way of learning and lessen the difficulties of the students in problem solving.

2. Future researchers who will conduct related studies covering other variables not present in this study may use the result of this study as a reference. The result of this study may also serve as a reference for other researcher to formulate strategies that will help in alleviating mathematics anxiety.

3. Parents and Teachers should strengthen the adaptation, application, and consistency of school policy regarding absentism/cutting classes. Also, it should have an accurate monitoring of attendance to avoid absentism.

PROPOSED ACTION PLAN

PROPOSED ACTION PLAN FOR IMPROVED LEARNING OF STUDENTS' DIFFICULTIES IN PROBLEM-SOLVING

Rationale

Education is wealth. It is the most precious treasure that cannot be stolen. One of the basic thrusts of educators is to impart knowledge and facilitate their learnings most especially in Mathematics. Students often perceived Mathematics as one of the most incomprehensible and abstract subjects. Regardless of the significant role of Mathematics, students appear to have difficulties in learning the subject. Nowadays, students are facing complexities in life brought about by the fast-changing world. In addition, a metamorphic change of the educational system due to pandemic gives another burden of difficulties in acquiring knowledge and skills most especially in problem-solving. This existing circumstance suffocate the educational needs of the students that might be the reason of their learning difficulties in mathematics.

The school has the obligation to provide and maintain quality education to enhance the educational needs of the students and to ensure their learnings in its ability in order for them to be globally competent and well-skilled individual. One strategy to achieve this is to assist students in overcoming their learning challenges in problem-solving which hinders in acquiring good scholastic standing.

As young as they are, they have a tendency to be unable to cope up with the circumstances resulting in poor problem-solving abilities. For this reason, all components of students' educational process must initiate ways and means to

assist them in achieving their aim of improved performance and deep comprehension in problem-solving.

The findings of the study manifest the importance of tracking the root causes of the learning difficulties in problem-solving met by the students. With the researchers' findings of having moderate level of seriousness in students' difficulties in problem-solving and predictors that causes it, can still be improved and enhanced to its maximum level when remedied.

In this connection, the researchers propose an action plan for improved learning of students' difficulties in problem-solving of the Bachelor in Secondary Education Major in Mathematics of Bohol Island State University Bilar Campus.

OBJECTIVES

After the implementation of the proposed action for improved learning of students' difficulties in problem-solving, the researchers hope to attain the following objectives:

1. To determine appropriate teaching strategies to deepen the level of understanding of the students in problem-solving.
2. To identify the strength and weaknesses of the students.
3. To increase motivation in school work.
4. To enhance the personal and professional development of the teachers.

5. To develop a positive student-teacher relationship where they could be able to uplift each other and to apply collaborative effort to make the teaching learning process effective.

6. To establish an avenue for students to address their specific academic demands most especially in problem-solving.

7. To provide students with educational assistance in the form of financial support aid to be used in online classes.

8. To improve the teaching and learning process in problem-solving by enriching mathematics training.

MECHANICS OF IMPLEMENTATION

The findings of the research will be presented to all teachers for review and discussion of the recommended program for improving students' problem-solving abilities. The paper will be forwarded to the Math teachers, and to the Dean of the College of Education of Bohol Island State University Bilar Campus for further consultation. After the consultation, the researchers will submit a copy of the proposed action plan to the administration for endorsement to the Campus Director for careful study and approval. The revision and modification will be adopted after a series of validation and consultation.

SCHEDULE OF IMPLEMENTATION

The implementation of the proposed action plan for improved learning of students' difficulties in problem-solving will start on the 1st semester, A.Y. 2022-

2023. The success of this implementation would largely depend on the faculty members, school administrations, campus director, and the students.

EVALUATION MEASURES

Implementing Committee can be organized where the researcher is one of the members who will closely monitor the implementation.

To test the effectiveness of the proposed action plan, the following measures should be undertaken:

PROPOSED ENHANCEMENT PROGRAM IN MATHEMATICS

Areas of Concerns	Objectives	Suggested Activities	Person(s) involved	Time Frame	Success Indicators/Outcomes
Students Performance	To improve the learnings of the students in problem-solving.	Extension classes	Teachers Students	Whole semester (once a week)	Good scholastic standing of the students
Social- Mental Abilities	To develop social skills, increase motivation, enhance knowledge and to perform better.	Motivation session Formulation of engaging learning strategies Mathematical concept training	Class Adviser Instructor Dept. Head Students	September to October	Improved knowledge and skills Increase motivation in learning the subject
Skills in Mathematics	Determine the weak and strong points of the students in Mathematics. Improve the mastery level of the students on	Administer diagnostic test to students enrolled in Math subject. Conduct remedial classes to low achievers.	Teacher	1 st week of classes	Strong and weak point of determination Remedial classes conducted and improve math skills

	<p>the expected Math skills.</p> <p>To evaluate and assess the progress of the students' mathematics learning skills and retention of knowledge.</p>	<p>Conducting a summative test</p>	<p>Math instructor and students</p>	<p>Sept. to June</p>	<p>Knowledge and skills applied</p>
<p>Teacher</p>	<p>To find out effective strategies and areas of improvement.</p> <p>To determine the quality of teacher's instruction as evidenced by the students' performance.</p>	<p>Students evaluation toward teachers</p> <p>Regular report of achievements. (every end of semester) Seminars/Training /Workshop.</p>	<p>Students, Teacher, School administrator and Campus director</p>	<p>Every end of the semester</p>	<p>Effective strategies and technique in the teacher learning process</p> <p>Expertise development</p>
<p>Flexible Learning</p>	<p>To cater all students with a better understanding of the changes of the educational system that might added difficulties to their learning challenges in problem-solving.</p>	<p>Comprehensible orientation of flexible learning "modular and online classes".</p>	<p>Students</p>	<p>1st or 2nd week of Sept.</p>	<p>Deep comprehension towards concurrent situation in this new normal education</p>

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APPENDICES

**APPENDIX A – Letters
APPENDIX A.1**



Republic of the Philippines
BOHOL ISLAND STATE UNIVERSITY- BILAR
Zamora, Bilar, Bohol



October 14, 2021

NOEL LOMOSBOG, Ph.D.
Dean, College of Agriculture and Natural Resources
BISU-Bilar Campus
Zamora, Bilar, Bohol

Sir:

Greeting!

The undersigned BSEd IV students major in Mathematics of Bohol Island State University- Bilar Campus humbly request permission from your Office to conduct a preliminary survey in this institution specifically the BSABE III students of the College of Agriculture and Natural Resources to validate the instrument of our research entitled "**FACTORS AFFECTING STUDENTS' DIFFICULTIES IN PROBLEM-SOLVING IN THE NEW NORMAL EDUCATION**", in partial fulfillment of the requirements for the degree of Bachelor in Secondary Education (BSEd).

May this request merit this approval.

Thank you very much and God Bless!

Very respectfully yours,

(Sgd.) **JOAN O. BUSBUSO**

(Sgd.) **ROBERTO C. CAÑO JR.**

(Sgd.) **JUMIE E. CABRUBIAS**

Student Researchers

Noted:

(Sgd.) **REAL A. BAGUIN, MA.Ed.**
Research Adviser

Recommending Approval:

(Sgd.) **ENGR. ERWIN LUDEVESE**
Chairperson, Department of ABE

Approved:

(Sgd.) **NOEL LOMOSBOG, Ph.D.**
Dean, College of Agriculture and Natural Resource

APPENDIX A.2



Republic of the Philippines
BOHOL ISLAND STATE UNIVERSITY- BILAR
 Zamora, Bilar, Bohol



October 14, 2021

MA. QUIMAR Q. GAHIT, Ed.D.
 Dean, College of Teacher Education
 BISU-Bilar Campus
 Zamora, Bilar, Bohol

Ma'am:

The undersigned BSEd IV students major in Mathematics of this institution humbly request permission from your Office to conduct a research entitled "**FACTORS AFFECTING STUDENTS' DIFFICULTIES IN PROBLEM-SOLVING IN THE NEW NORMAL EDUCATION**", in partial fulfillment of the requirements for the degree of Bachelor in Secondary Education (BSEd).

In this regard we humbly request permission from your Office to allow us to conduct our study in this institution specifically the BSEd- Mathematics II and III students of the College of Teacher Education. Google form will be used to gather the needed data for the researchers and the respondent's safety.

May this request merit this approval.

Thank you very much and God Bless.

Very respectfully yours,

(Sgd.) **JOAN O. BUSBUSO**

(Sgd.) **ROBERTO C. CAÑO JR.**

(Sgd.) **JUMIE E. CABRRUBIAS**

Student Researchers

Noted:

(Sgd.) **REAL A. BAGUIN, MA.Ed.**
 Research Adviser

Recommending Approval:

(Sgd.) **LIBRADA S. QUILAS, Ph.D.**
 Chairperson, College of Teacher Education

Approved:

(Sgd.) **MA. QUIMAR Q. GAHIT, Ed.D.**
 Dean, College of Teacher Education

APPENDIX A.3

Republic of the Philippines
BOHOL ISLAND STATE UNIVERSITY- BILAR
Zamora, Bilar, Bohol



October 14, 2021

Dear Students,

We, Roberto C. Caño Jr., Jumie E. Cabarrubias, Joan O. Busbuso, BSEd Math VI students of Bohol Island State University- Bilar Campus are conducting an action researched entitled "Factors Affecting Students in Problem-Solving in the New Normal Education".

In view of this, we humbly request your help by answering the Google Form to give us the data needed in our study. Rest assured that any information will be kept confidential.

Thank you so much for your cooperation!

Respectively yours,
The Researchers

APPENDIX B
Research Instrument

Dear Respondents,

We humbly request for your kind help by sincerely and honestly answering the test questionnaire for the needed data of our study. Rest assured that your answers will be kept confidential.

Thank you very much for your time and cooperation.

-The Researchers

Name: (Optional) _____ Year level: _____

Age: _____ School: _____ Gender: _____

PERSONALITY QUESTIONNAIRE

Instruction: Please read each statement carefully and then mark check the appropriate response below. Use the following indicators that will corresponds your answer.

Indicators:

5 – Strongly Agree

4 – Agree

3 – Neutral or cannot decide

2 – Disagree

1 – Strongly Disagree

	Characteristic	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
	I see myself as someone who....					
1	Is talkative					
2	Tends to find fault with others					
3	Does a thorough job					
4	Is depressed, blue					
5	Is original, come up with new ideas					
6	Is reserved					
7	Is helpful and unselfish with others					
8	Can be somewhat careless					
9	Is relaxed, handle stress well					
10	Is curious about many different things					
11	Is full of energy					
12	Starts quarrels with others					
13	Is a reliable worker					
14	Can be tense					
15	Is ingenious, a deep thinker					
16	Generates a lot of enthusiasm					
17	Has a forgiving nature					
18	Tends to be disorganized					
19	Worries a lot					
20	Tends to be lazy					
21	Is emotionally stable, not easily upset					
22	Is inventive					
23	Has an assertive personality					
24	Can be cold and aloof					

25	Perseveres until the task is finished					
26	Can be moody					
27	Values artistic, aesthetic experiences					
28	Is sometimes shy, inhibited					
29	Is considerate and kind to almost everyone					
30	Does thing efficiently					
31	Remains calm in tense situations					
32	Prefers work that is routine					
33	Is outgoing, sociable					
34	Is sometimes rude to others					
35	Make plans and follows through with them					
36	Gets nervous easily					
37	Likes to reflect, play with ideas					
38	Has a few artistic interests					
38	Likes to cooperate with others					
40	Is easily distracted					
41	Is sophisticated in art, music, or literature					

QUESTIONNAIRE ON FACTORS AFFECTING STUDENTS' DIFFICULTIES IN PROBLEM-SOLVING

Instruction: Listed below are the Factors Affecting Students' Difficulties in Problem Solving. Please check the appropriate column that best describes the level of difficulty you have experienced.

Indicators:

SCALE	DESCRIPTION	RANGE	INTERPRETATION
5	Strongly Agree	4.20 – 5.00	If the problem is always experienced
4	Agree	3.40 – 4.19	If the problem is experienced often
3	Neutral or cannot decide	2.60 – 3.39	If the problem is sometimes experienced
2	Disagree	1.80 – 2.59	If the problem is rarely experienced
1	Strongly Disagree	1.00 - 1.79	(If the problem is never experienced

A. Teacher

	Learning Difficulties	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
1	Insufficient knowledge of the subject matter.					
2	Lacks teaching strategies.					
3	Does not have mastery in delivering the lesson.					
4	Does not clarify ideas in answer to students' questions regarding the lesson.					
5	Does not presents ideas or concepts in a clear and understandable manner.					
6	Does not give examples and challenging questions or problems for discussion.					
7	Does not introduce the lesson with stimulating ideas about the subject.					
8	Does not demonstrate concern of students with poor performance.					

9	Does not use appropriate instructional material.					
10	Does not encourage class participation and critical thinking.					
11	Does not guide students to accomplish learning goals.					
12	Is not open minded and not approachable.					
13	. Does not report to class regularly and on time.					

Others (please specify): _____

B. Student

	Learning Difficulties	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
1	Lack of interest in Problem Solving.					
2	Easily get bored when it comes to problem solving.					
3	Unable to cope up with the teacher's discussion.					
4	Unable to understand without the teacher's discussion.					
5	Lack of motivation.					
6	Unable to recall the previous lesson.					
7	Having hard times in understanding the given problems.					
8	Unable to understand the given example without further explanation.					
9	Personal problems (e.g. family, financially, etc.)					
10	Health					
11	Abseentism/Cutting classes					
12	Self-doubt					
13	Insufficient Knowledge					

Others (please specify): _____

C. Flexible Learning

	Learning Difficulties	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
1	I have no access a reliable internet connection.					
2	I could not communicate actively online via email or discussion.					
3	I do not able to dedicate at least 46 hours per week, on online course.					
4	I could not able to set goals and deadlines for myself					
5	I have unstable internet connection					
6	I do not have conducive learning environment					
7	I am not totally convinced that I will get the same value of education from an online course.					
8	I can not easily understand concept notes and examples					
9	I lack educational resources					
10	I do not have internet load					

Others (please specify): _____

APPENDIX C

Raw data

PROFILE OF THE RESPONDENTS				RESPONSES				
Respondent's Number	Age	Sex	Year Level	Personality Types	Teacher	Students	Flexible Learning	Mean
1	20	F	2	3.41	3.85	3.77	4.1	3.7825
2	19	F	2	3.76	2.31	2.38	1.9	2.5871
3	19	F	2	3.37	2.08	3.38	3	2.9568
4	20	M	2	3.15	3.08	4.00	4.7	3.7308
5	20	M	2	3.73	1.62	3.77	4	3.2791
6	19	F	2	3.27	2.77	2.85	3	2.9709
7	19	F	2	3.56	2.00	1.92	2.9	2.5960
8	20	M	2	3.46	1.54	2.15	3.8	2.7389
9	20	F	2	3.32	2.62	2.38	3.2	2.8793
10	20	F	2	3.54	4.23	3.15	3.8	3.6803
11	19	F	2	3.44	2.46	3.08	2	2.7444
12	19	F	2	3.39	2.54	2.92	3.6	3.1129
13	19	F	2	3.44	1.08	2.92	2.7	2.5348
14	19	F	2	3.44	1.85	2.69	2.9	2.7194
15	19	F	2	3.27	2.38	2.77	3.3	2.9305
16	20	M	2	3.41	3.15	3.00	4.1	3.4171
17	19	F	2	3.39	2.77	3.38	4	3.3860
18	19	M	2	3.88	3.69	1.85	4.3	3.4291
19	20	F	2	3.44	2.31	2.54	3.8	3.0213
20	21	M	2	3.24	3.00	4.00	4.6	3.7110
21	19	F	2	3.27	2.69	4.00	3.8	3.4402
22	20	F	2	3.46	2.46	2.54	2.7	2.7909
23	19	F	2	3.41	1.92	3.46	4	3.1998
24	19	F	2	3.20	2.46	3.38	3.2	3.0603
25	25	F	2	3.46	3.00	4.23	3.8	3.6235
26	20	F	2	3.51	2.08	3.54	3.1	3.0569
27	19	F	2	3.41	2.15	2.62	3.4	2.8960
28	19	F	2	3.51	1.69	2.92	2.8	2.7319
29	19	F	2	3.49	3.23	4.54	3.5	3.6893
30	20	F	2	3.41	2.92	3.31	4	3.4114
31	20	F	2	3.24	2.00	2.69	3.1	2.7591
32	19	F	2	3.46	1.23	1.00	1.4	1.7735
33	20	F	2	3.17	2.92	2.85	4.1	3.2600
34	21	M	2	3.27	3.46	2.85	4.8	3.5940
35	20	M	3	3.22	3.00	2.77	3.5	3.1222
36	21	M	3	3.46	4.15	4.23	4.6	4.1120
37	21	F	3	3.44	4.31	3.38	4.5	3.9078
38	20	F	3	3.54	1.46	2.38	3.6	2.7457
39	20	M	3	3.37	3.62	3.23	3.8	3.5030
40	21	M	3	3.29	2.08	3.15	3.5	3.0059

41	19	F	3	3.63	1.62	1.77	3.9	2.7297
42	20	F	3	3.29	4.00	4.00	4	3.8232
43	22	F	3	3.32	2.92	4.08	3.9	3.5543
44	21	F	3	3.32	4.46	3.92	4	3.9254
45	19	F	3	3.85	3.85	3.23	4.8	3.9326
46	21	F	3	3.41	1.38	1.77	2	2.1421
47	21	F	3	3.27	3.38	2.38	3.3	3.0844
48	30	F	3	3.27	3.46	3.38	4.3	3.6036
49	22	M	3	3.32	1.00	3.23	3.6	2.7870
50	20	F	3	3.44	3.77	4.23	4.1	3.8848
51	22	M	3	3.39	2.00	1.92	2	2.3283
52	20	M	3	3.37	2.38	3.15	4.2	3.2761
53	20	M	3	2.98	4.08	3.08	3.3	3.3574
54	22	F	3	3.07	3.15	3.00	3	3.0568
55	22	F	3	3.78	2.08	2.46	3.3	2.9047
56	21	F	3	3.29	2.31	2.38	3.9	2.9712
57	34	F	3	3.20	2.54	3.15	5	3.4719
58	20	F	3	3.46	3.54	1.62	3.8	3.1043
59	20	F	3	3.41	2.23	3.08	3.8	3.1306
60	21	F	3	3.41	1.54	2.38	3.5	2.7094
61	23	F	3	3.73	1.85	2.46	4.2	3.0598
62	25	M	3	3.24	3.08	3.00	4.6	3.4802
63	21	M	3	3.51	1.23	3.54	2.3	2.6454
64	21	F	3	3.37	4.92	5.00	3.4	4.1722
65	21	F	3	3.44	2.46	3.08	3.7	3.1694
66	20	M	3	3.51	2.46	2.85	3.1	2.9800

