Emilio Aguinaldo College-Cavite

STUDENT RESEARCH JOURNAL

EAC ORGANIZATIONAL CHART

Emilio Aguinaldo Educational Corporation
Emilio Aguinaldo College-Cavite
Organizational Chart
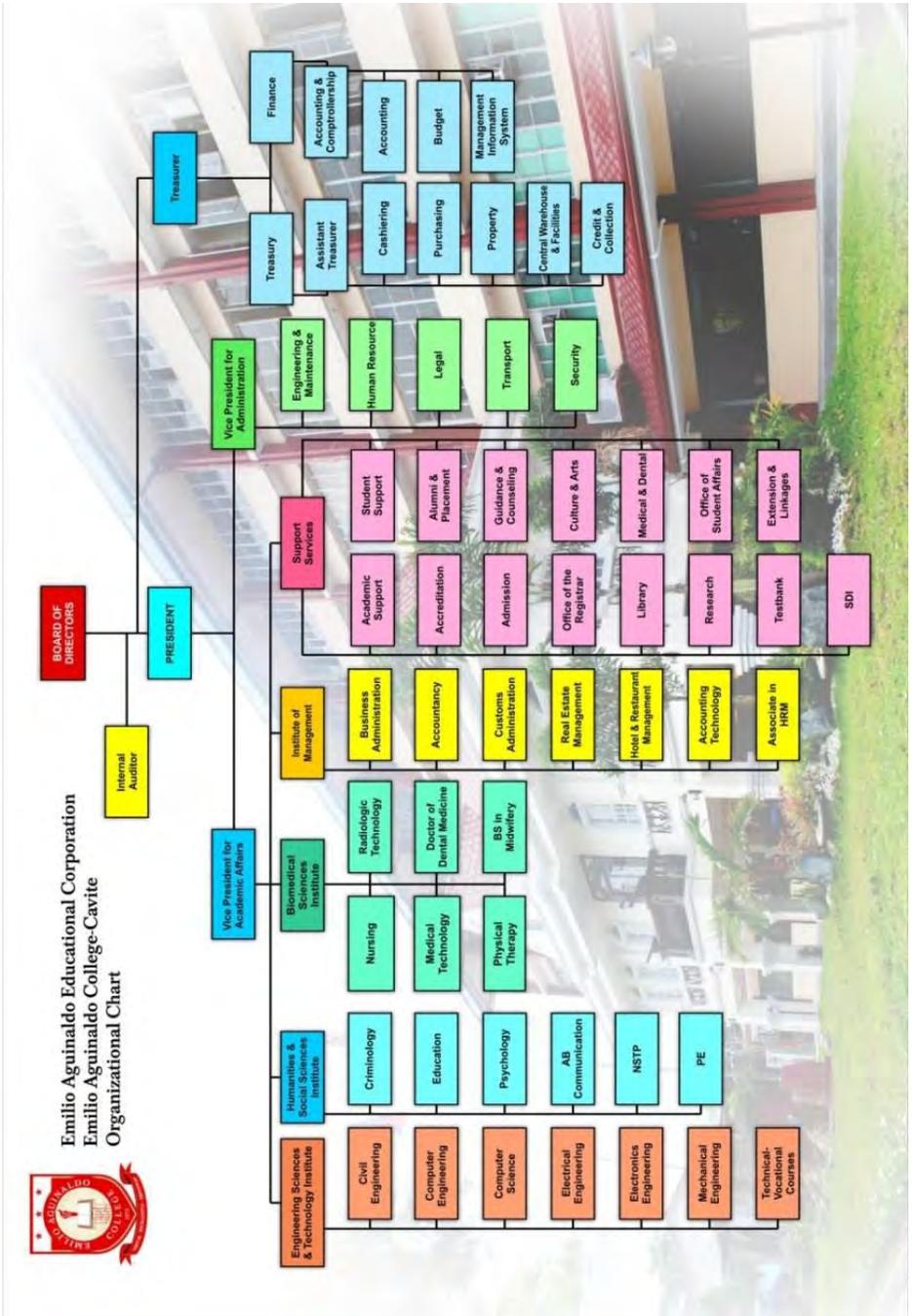
Brief History of Emilio Aguinaldo College

The beginnings of Emilio Aguinaldo College - Cavite are attributed to Dr. Paulo C. Campos, then President of the University Physicians Services Incorporated (UPSI), which acquired the Marian College in Manila in 1973. Eventually, the school became Emilio Aguinaldo College.

With the various socio-economic developments and related circumstances during the Marcos regime, UPSI decided to open a new campus in Dasmariñas, Cavite, which is the hometown of Dr. Campos. This is to support the government's policy on the dispersal and decongestion of the student population in Metro Manila, particularly in institutions of higher learning. The policy also aimed to introduce regional development and democratization of opportunities in the rural areas (Campos, 2008).

Emilio Aguinaldo College in Bagong Bayan, Dasmariñas, Cavite was opened on March 17, 1978. Its opening coincided with the efforts of the then President, Ferdinand E Marcos and wife Imelda Marcos, who was the Minister of Human Settlements and Community Development, to remove the slum dwellers from the streets and under bridges of Manila and relocate them to Cavite. Dr. Campos proposed to the government through the Secretary of Education, Juan L. Manuel, to offer a tertiary school in Dasmariñas, Cavite patterned after the Emilio Aguinaldo College that had been approved in Manila (Campos, 2008).

Consequently, a campus comprising 29 hectares was established. In 1976 to 1978, UPSI developed over a dozen school facilities including school rooms, laboratories, a library, social hall, an administration building, dormitories, an Olympic oval, a landscaped campus, and a man-made lake. They also built a network of roads that covered the whole campus and dormitories (Campos, 2008). A commitment to improve the lives of the underprivileged sectors of the community motivated EAC-Cavite to offer courses in Dressmaking, High Speed Machine Operation and Ceramics. All programs were structured either for six months or two years of intensive study and training.

In the following year, owing to the permit granted by Minister Juan Manuel of the Ministry of Education and Culture, EAC-Cavite opened the College of Criminology, listing among its students the police forces in Cavite as well as the members of the Philippine Constabulary and the security guards of the establishments in the vicinity. In addition, the Graduate Program leading to the degree of Master of Arts in Teaching was offered to provide the school teachers with professional and academic advancement and opportunities. Envisioned, too, were the programs for Master of Science in Nursing and Master of Arts in Education.

On October 21, 1979, General Emilio Aguinaldo Medical School Foundation Inc. (GEAMSFI) was established in Dasmariñas, Cavite, thus giving birth to the Emilio Aguinaldo College- Cavite of Medicine with Dr. Lourdes E. Campos as Dean. In its first year of operations, the College had 150 students. The University Medical Center (UMC), which was built in 1980 and opened in 1983, served as the training center for the health science students of the College of Medicine and other health science courses.

In 1980, UPSI formed the Yaman Lahi Foundation, Inc. (YLFI) to manage and operate both Manila and Cavite campuses.

In 1986, when Dr. Paulo Campos was not in perfect health anymore, Brother Andrew Gonzales of the De La Salle University (DLSU) expressed the University's interest in acquiring the EAC College of Medicine and the University Medical Center (UMC). Since his UPSI colleagues were not ready to take over, Dr. Campos decided to transfer the ownership and responsibility to this worthy and credible institution.

It was in June 1987 when De La Salle University finally took over the management and the administration of two campuses from UPSI: the 29-hectare campus in Bagong Bayan, Dasmariñas and the 1.5 hectare Health Science Campus along Congressional Avenue. Included in the transfer were the two big buildings which had a length of 100 meters, 17-meter wide and seven levels of floor area with two elevators, including a basement, ground floor, and rooftop for water tanks and for viewing purposes. The 29-hectare property in Bagong Bayan had a dozen buildings that included classrooms, two administrative units, Olympic oval, network roads and a landscape that included a lake, teaching facilities, hospital equipment, a modest library and a historical museum. After that, the EAC Administration focused on the development of EAC-Manila.

EAC-Cavite reopened in 1996-1997 as a vocational technical school – Center for Technical Education and Skills Training (CTEST)   - in a lot along Congressional Avenue (now Mangubat Avenue) which UPSI bought. In 1998, after the completion of five buildings, the voc-tech school became the EAC-Cavite campus and all academic courses were opened except medicine.

In 2001, under the leadership of Dr. Jose Paulo E. Campos, the first son of Dr. Jose Paulo E. Campos, the school administration strengthened the curricula of existing academic programs and opened new courses aligned with emerging trends. In 2003, the Commission on Higher Education (CHED) granted government recognition to AB Communication, Psychology, Business Administration, Accountancy, Computer Science, Secondary Education, and Hotel and Restaurant Management.

The other academic programs soon followed. In 2005, Elementary Education, Civil Engineering, Mechanical Engineering, and Diploma in

Graduate Midwifery earned government recognition, followed by Nursing and Criminology in 2006; Customs Administration in 2007; and Computer Engineering and Electronics and Communication Engineering in 2010.

In 2008, the Technical Education and Skills Development Authority (TESDA)-registered vocational-technical courses, namely, Automotive Servicing, Computer Hardware Servicing, Consumer Electronics Servicing, Machining, and Programming were offered. In response to the emerging trends on health sciences, real estate and tourism, the administration opened Medical Technology, Physical Therapy and Radiologic Technology in 2011, Doctor of Dental Medicine and Real Estate Management in 2012, and Bachelor of Science in Midwifery and Tourism Management in 2015.

In its quest to achieve excellent standards in higher education, the institution participated in the accreditation by the Philippine Association of Colleges and Universities Commission on Accreditation (PACUCOA), thus, receiving Level 1 Accredited Status in Nursing, Psychology, Criminology and Hotel and Restaurant Management programs in 2015 up to 2018. Likewise, Elementary Education, Secondary Education and Business Administration programs were granted Candidate Status until 2017.

Along with the commitment to innovate, the institution inaugurated the *Bulwagang Aguinaldo* in 2012, which was the replica of the Aguinaldo Shrine in Kawit, Cavite making it the ideal venue for the annual Philippine Independence Day Celebration held by the city government of Dasmariñas. The modernization of Buildings 3 and 4 which house the Life Science Institute, Engineering Science and Technology Institute, and School Library were completed in 2014. These developments sought to meet the needs of the growing student population.

In adhering to the call of the Department of Education (DepEd) headed by Secretary Bro. Armin Luistro to enhance the basic education program in the country, the institution earned the permit to implement the Senior High School programs in April 2015. This paved way for the restructuring of Building 5 for Senior High School and Building 6 which housed the new canteen and multi-purpose hall. The Senior High School started its operations and welcomed its pioneer batch in June 2016.

The institution strives to explore more avenues to serve its community and undertake worthwhile development programs towards its continuous transformation as a responsive and competent institution, as its Founders envisioned it to be.

PHILOSOPHY

Emilio Aguinaldo College is a private, non-sectarian, co-educational institution of learning that fosters equal and fair opportunities for the holistic development of the persons conscious of their national identity and their roles in the global community.

VISION

Emilio Aguinaldo College envisions itself as an internationally recognized autonomous academic institution rooted in its nationalist tradition that consistently pursues the advancement and welfare of humanity.

MISSION

Emilio Aguinaldo College provides an outcomes-based education with relevant curricula geared towards excellent research, active industry cooperation and sustainable community extension.

CORE VALUES

Virtue

Emilio Aguinaldo College integrates knowledge and understanding among Emilians equipping them with wisdom to choose to do only the right thing.

Excellence

Emilio Aguinaldo College inculcates among Emilians the habit of doing only the best in all undertakings.

Service

Emilio Aguinaldo College develops among Emilians a strong sense of duty and   responsibility of helping others for the school, community, country and Mother Nature.

EDUCATIONAL OBJECTIVES

The objectives of Emilio Aguinaldo College are to:

- offer opportunities for quality and relevant education to all;
- cultivate the intellectual, spiritual, moral, social and physical aspects of a person;
- instill appreciation and pride for one's national identity; and
- produce graduates of global quality equipped with competencies in their field of expertise.

QUALITY POLICY

Emilio Aguinaldo College commits to the continuous improvement of quality standards with emphasis on instruction, research and community service to benefit its stakeholders.

QUALITY OBJECTIVES

The objectives of the Emilio Aguinaldo College are to:

- Adhere to all statutory and regulatory standards;
- Provide consistent quality service to the students, parents and other stakeholders; and
- Respond to periodic system review for continual improvement on quality standards.

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Facebook Utilization for Spreading Depression Awareness: Impact on Help-Seeking Behavior of Grade 12 Students in Emilio Aguinaldo College-Cavite

Jessica Esguerra, Rowena G. Igcalinos, Teresa A. Mactal and Maribel T. Leocario

School of Arts and Sciences

Abstract. The researchers of the study had discovered the significant relationship of the Facebook utilization for spreading depression awareness and help-seeking behavior. Facebook has an advantage of spreading awareness about depression. People nowadays spend most of their time to social media specifically Facebook where users can spread depression awareness, can seek help and give sympathy and empathy to other Facebook users. This study focused only on discovering the relationship between Facebook utilization for spreading depression awareness and impact of help-seeking behavior of the grade 12 students. The participants of this study were purposively and inferentially selected. The researchers conducted the study at the Emilio Aguinaldo which is located at Gov. D. Mangubat St., Brgy. Burol Main, City of Dasmariñas Cavite. The researchers provided a survey questionnaire to each participant. The statistical treatment that were used to analyze and interpret the data were the mean, likert scale, chi-square and person r. It was found that most of the Facebook users are female and introvert. The Facebook users usually spend 3-6 hours on Facebook. it was found that there is no significant relationship between sex and Facebook utilization was found. But there is no significant relationship between the personality type and Facebook utilization. And lastly, there is a significant relationship between the perception of the participants on role of Facebook utilization for spreading depression awareness and help-seeking behavior of the grade 12 students.

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INTRODUCTION

The World Health Organization (2014) has defined depression as a common mental disorder associated with feeling of sadness, losing interest or pleasure, guilty feeling or low self-worth, sleep disorder or appetite, tired feeling, and poor concentration. Depression described as a common response to health problems and is often an under-diagnosed problem in the elderly population. People can be depressed due to injury or illness; suffering from an earlier loss, or they may seek health care for somatic complaints that are bodily manifestations of depression. Smeltzer (2010) also defined depression as "a state in which a person feels sad, distressed and hopeless with little to no energy for normal activities".

Depression is something that you feel at random times. It just creeps up on you when you are thinking. Many people describe it as drowning or being in a roller coaster that only goes down. It is when you over think your own problems with in your life. It is when your thoughts are very conflicted and you don't know where you stand. Social media can provide mental health support. There are many people suffering from mental illness who don't receive support from the people closest to them. They often turn to the Internet to search for encouragement from the online mental health community. (Stuart, 2013)

Teen depression is a serious mental health problem that causes a persistent feeling of sadness and loss of interest in activities. It affects how teena ger thinks, feels and behaves, and it can cause emotional, functional and physical problems. Although depression can occur at any time in life, symptoms may be different between teens and adult. Issues such as peer pressure, academic expectations and changing bodies can bring a lot of ups and downs for teens. But for some teens, the lows are more than just temporary feelings; they are a symptom of depression. Teen depression isn't a weakness or something that can be overcome with willpower, it has serious consequences and requires long term treatment (Mayo clinic, 2018).

Facebook is a website which allows users, who sign-up for free profiles, to connect with friends, work colleagues or people they don't know, online. It allows users to share pictures, music, videos, and articles, as well as their own thoughts and opinions with however many people they

like. Users send "friend requests" to people who they may – or may not – know. Once accepted, the two profiles are connected with both users able to see whatever the other person posts. "Facebookers" can post almost anything to their "timeline", a snapshot of what is happening in their social circle at any given time, and can also enter private chat with other friends who are online. People with profiles list information about themselves. Whether it be what they work at, where they are studying, ages, or other personal details, many users post lots of information which is easily accessible to their friends and others. On top of this, users can "like" other pages which interest them (Webwise 2014).

In the Philippines being involved in social media (social networking) is one of the most active web-based activities. Because of this, Filipinos are declared to be the most active users on a number of web-based social network sites, such as Facebook, Instagram, Snapchat and Twitter. The use of social networking websites has become so extensive that the country is now called "The Social Networking Capital of the World" The House of I.T (2018). As of the beginning of this year, the total population in the Philippines has reached over 100 million – and 46% of the population is active Internet users.

It's not surprising that almost all Filipinos are actively joining social media, not just to connect with friends and family but also for the purpose of catching news, purchasing products and services, and even job searching. Indeed, social media continues to change the way we live (Keane, 2018).

Mental health is a global issue and brands are getting more creative about increasing awareness around this important area of healthcare. Much of this is down to intelligent use of data, enabling marketers to interrogate the numbers and understand where the barriers to communication lie, building a campaign that really works. For 2018's Mental Health Awareness Week, #powerofokay, #hereforyou, #UOKM8 #Inyourcorner, #PeoplelikeUs are the five of the most impactful mental health campaigns that have drawn on powerful consumer insights to create messages that resonate (Keane 2018).

Facebook use remains prolific and appears to continue to grow. Accordingly, adolescents report to spend more time and have more friends on Facebook now than in previous years (Ellison et al., 2007; Kalpidou et al., 2011; Pettijohn II, 2012). Therefore, it appears important to continue

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to investigate the possible help seeking attitude. (Michelle Daniels, 2014) In terms of the potential relationship between Facebook use and help seeking attitude, the findings of the present research largely replicated those reported by authors such as Davila et al. (2012), Labrague (2014), and Feliciano et al. (2014) that call into question the relationship between greater Facebook usage and increased help seeking attitude in adolescents. (Michelle Daniels, 2014)

Adolescence is the time of major transitions, in which the potential for much conflict and stress are numerous how successfully the students deal with this transitions that occur during adolescence, very few adolescences seek help in coping with their problems (Cauce, 2002).

According to Nadler 2001, the seeking of help and the utilization of support systems by adolescents have a buffering effect on reactions to stress, resulting in better adjustment and less emotional and behavioral problems. Nonetheless, adolescents do not often utilize communal support systems in general, nor professional help in particular. Even when suffering from depression, drug abuse and other psychiatric disorders, adolescents often forgo help. Help-seeking is defined as actively seeking out assistance for a problem and concern from anyone, including friends, family and professionals (e.g., teacher, school counselor, doctor). Although help seeking consider adaptive, it has been consistently reported that few adolescents experiencing problems seek appropriate help (Cauce, 2002).

In this research, the Facebook utilization for spreading depression awareness is the independent variable. The researchers determine if the independent variable caused significant relationship on the dependent variable which is the impact on help seeking behavior as manifested in the result of the obtained from the administration of instrumentation through voluntary contribution of the participants to elicit their natural response.

Study aims to show the significant relationship between Facebook utilization for spreading depression awareness and impact of help-seeking behavior. The researcher will be able to see the positive side of using Facebook website for spreading depression awareness. Using Facebook it will serve as a channel to all the students to become aware about depression and also to influence and give awareness to their friends and relatives who also using Facebook. Through Facebook, everyone can

seek help to other people who are aware about depression and have knowledge and willing to give social support to those people who are need.

This study contains three (3) sets of questions including (1) the demographic profile of the student, (2) the student's Facebook utilization for spreading depression awareness that contained 20 items and (3) 20 items for the impact of help-seeking behavior among grade 12 students of Emilio Aguinaldo College – Cavite.

Background of the Study

Facebook and other social networks have replaced the traditional means of communication and especially among young people or adolescence. They form an important part of their everyday life. Through Facebook and other social networks adolescence communicates, is informed or aware and creates relationships. Facebook offers its user identity and a sense of freedom, it also helps shy and introvert people who struggle to take part into conversation. To build a social capital and help those people who seek help about mental illness. Using Facebook we can also gain knowledge about some serious issue like depression (Amichai-Hamburger & Vinitzky, 2010).

Longitudinal studies of community and clinic-based population samples suggest that 60-90% of episodes of depression in adolescents remit within year. However, in follow up studies 50-70% of patients who remit develop subsequent depressive episodes within 5 years. Clinic-referred patients generally fare less well than those treated in the community. Moreover, in adults very few individuals show complete symptomatic and functional recovery between depressive episodes, with most reporting residual symptoms or impairment. Finally, depression in adolescence also predicts a range of mental health disorder in adult life, anxiety disorders, substance-related disorders and bipolar disorder as well as suicidal behavior and physical health problems Anita Thapar, Stephan Collishaw and Ajay Thapar (2012).

To study weather language on Facebook could predict a depression diagnosis, Eichstaedt and his colleagues found that people with depression used more "I" language (first person singular pronouns) and word reflecting hostility and loneliness on the months preceding their clinical diagnosis. By discovering this information people who are using

Facebook to spread depression awareness can easily determine who really need them.

Adolescence is a crucial period for developing and maintaining social and emotional habits important for mental well-being. Some adolescents are at greater risk of mental health conditions due to their living conditions, stigma, discrimination or exclusion, or lack of access to quality support and services. Worldwide, it is estimated that 10–20% of adolescents' experience mental health conditions, yet these remain under diagnosed and undertreated. Signs of poor mental health can be overlooked for a number of reasons, such as a lack of knowledge or awareness about mental health among health workers, or stigma preventing them from seeking help (WHO, 2018).

Almost all adults aged 16-24 years old years (91%) used social networks and vast majority (90%) of 16-24 years old own a smart phone. Young people are more likely to use the internet to look up information about mental health issues, with around 33% of those aged 18-29 years doing so. In a recent study 73% of young people relied on TV, radio, social networks, and websites to get information on self-harm compared to just 11% who sought information from health care professionals. There is potential from mental health services providers to tap into the support already being provided by online communities and it is likely that as online and mobile services become more integrated with our everyday lives, so too will they become more integrated with the provision of mental health services. The potential benefits of online mental health help seeking behavior include greater anonymity and confidentiality, which lowers concerns regarding any associated stigma. Access 24 hours a day to online resources is easier than face to face access to health care practitioners and the range of ways in which information is accessed can be empowering to users (Gowen LK., 2016).

Facebook used as a platform for the campaign about spreading depression awareness across the nation by using different #hashtags, creating memes stating about depression, and Facebook pages that entertain common feeling, they share and express their feelings. They discover comfort to that Facebook pages. Facebook is not a news source, so it can neither be reliable or unreliable. Facebook is merely a platform that allows people to post what they wish. Some people post news items from reliable sources, other post news from disreputable places; it is up to the consumer to evaluate whether any particular item is trustworthy.

Generally, anything from a legitimate, legacy news organization is reliable. That includes traditional newspapers, news magazines and major broadcasters (Ted Streuli, 2018).

This study focuses on furthering research within the field of Psychology by correlating the Facebook utilization on spreading depression awareness and impact of help -seeking behavior among selected grade 12 students of Emilio Aguinaldo College-Cavite. Since the presence of depression has become a growing issue, conducting research on this relatively new interaction between social media use and depression awareness, will assist in acquiring a better understanding of the specifics of this mental disorder. A greater understanding will result in mental health professionals being better prepared and more equipped to handle situations that involves individuals with depression. As a result, the purpose of this study is to better understand the relationship of Facebook utilization for spreading awareness and impact of help seeking behavior among grade 12 students of Emilio Aguinaldo College-Cavite.

Statement of the Problem

Generally, the purpose of this study seeks to determine the Facebook Utilization for Spreading Depression Awareness: Impact on Help Seeking Behavior.

Specifically, it seeks to answer the following;

1. What is the demographic profile of the respondents in terms of _____?

> ➢ Sex
> ➢ Frequency of Facebook usage
> ➢ Personality type

2. What is the perception of the respondents on Facebook as a tool used for spreading depression awareness?

3. How do the respondents use Facebook to seek help about depression?

4. Is there a significant relationship between the sex of the respondents and Facebook utilization?

5. Is there a significant relationship between the personality type of the respondents and the help-seeking behavior of the respondents?

6. Is there a significant relationship between the perception of the respondents on the role of Facebook in spreading depression awareness and help- seeking behavior of respondents?

Objectives:

Generally, the purpose of this study is to determine the Facebook Utilization for Spreading Depression Awareness: Impact on Help Seeking Behavior.

Specifically, this aims to;

- ➢ To determine the perceptions of the participants on Facebook utilization for spreading depression awareness.
- ➢ To determine the participants, help-seeking behavior in Facebook.
- ➢ To determine the relationship between the personality type of the respondents and help-seeking behavior of the respondents.
- ➢ To determine the relationship between Facebook utilization for spreading depression awareness and help-seeking behavior of the participants.

Hypotheses

The researchers have come up with the following null hypotheses:

Ho1: There is no significant relationship between profile of the respondents in terms of sex and Facebook utilization

Ho2: There is no significant relationship between the personality type of the respondents and help-seeking behavior of the respondents.

Ho3: There is no significant relationship between the Facebook utilization for spreading depression awareness and help-seeking behavior of participants.

Theoretical Framework

Theory of Planned Behavior

The Theory of Planned Behavior (TPB) by Icek Ajzen started as the Theory of Reasoned Action in 1980 to predict an individual's intention to engage in a behavior at a specific time and place. The theory was

intended to explain all behaviors over which people have the ability to exert self-control. The key component to this model is behavioral intent; behavioral intentions are influenced by the attitude about the likelihood that the behavior will have the expected outcome and the subjective evaluation of the risks and benefits of that outcome.

The TPB has been used successfully to predict and explain a wide range of health behaviors and intentions including smoking, drinking, health services utilization, breastfeeding, and substance use, among others. The TPB states that behavioral achievement depends on both motivation (intention) and ability (behavioral control). It distinguishes between three types of beliefs - behavioral, normative, and control. The TPB is comprised of six constructs that collectively represent a person's actual control over the behavior.

Behavioral intention - This refers to the motivational factors that influence a given behavior where the stronger the intention to perform the behavior, the more likely the behavior will be performed.

Subjective norms - This refers to the belief about whether most people approve or disapprove of the behavior. It relates to a person's beliefs about whether peers and people of importance to the person think he or she should engage in the behavior.

Social norms - This refers to the customary codes of behavior in a group or people or larger cultural context. Social norms are considered normative, or standard, in a group of people.

Perceived power - This refers to the perceived presence of factors that may facilitate or impede performance of a behavior. Perceived power contributes to a person's perceived behavioral control over each of those factors.

Perceived behavioral control - This refers to a person's perception of the ease or difficulty of performing the behavior of interest. Perceived behavioral control varies across situations and actions, which results in a person having varying perceptions of behavioral control depending on the situation. This construct of the theory was added later, and created the shift from the Theory of Reasoned Action to the Theory of Planned Behavior.

The TPB has shown more utility in public health than the Health Belief Model, but it is still limiting in its inability to consider environmental and economic influences. Over the past several years, researchers have used some constructs of the TPB and added other components from behavioral theory to make it a more integrated model. This has been in response to some of the limitations of the TPB in addressing public health problems.

Uses and Gratification Theory

Uses and gratifications theory (UGT) is an approach to understanding why and how people actively seek out specific media to satisfy specific needs. UGT is an audience-centered approach to understanding mass communication. Diverging from other media effect theories that question "what does media do to people?", UGT focuses on "what do people do with media?" It postulates that media is a highly available product and the audiences are the consumers of the same product.

This communication theory is positivistic in its approach, based in the sociopsychological communication tradition, and focuses on communication at the mass media scale. The driving question of UGT is: Why do people use media and what do they use them for? UGT discusses how users deliberately choose media that will satisfy given needs and allow one to enhance knowledge, relaxation, social interactions/companionship, diversion, or escape.

It assumes that audience members are not passive consumers of media. Rather, the audience has power over their media consumption and assumes an active role in interpreting and integrating media into their own lives. Unlike other theoretical perspectives, UGT holds that audiences are responsible for choosing media to meet their desires and needs to achieve gratification. This theory would then imply that the media compete against other information sources for viewers' gratification.   UGT has a heuristic value today because it gives communication scholars a "perspective through which a number of ideas and theories about media choice, consumption, and even impact can be viewed".

The Theory of Planned behavior was used in this research to explained all the behaviors and intentions of the respondents on engaging to seek help on Facebook. The Theory of Planned Behavior is

compromised of six constructs that collectively represent the respondent's actual over the behavior but this research was focused only on two (2) constructs which are the Behavioral Intention and Perceived Behavioral Control. The behavioral intention used on the motivational factors that influence the behavior of the respondents to engage and seek help to Facebook. The perceived behavioral control used on the respondents perceptions on why they engage on Facebook and why they seek help through Facebook. The Uses and Gratification Theory used on this research to explained why and how the respondents actively seek help on Facebook. The Facebook provides a large number of audiences. Uses and Gratification Theory used in this research to know why do people use Facebook? Are they seeking help on Facebook and how they seek help on Facebok? This theory was used on media choice, consumption and the impact to the respondents.

Conceptual Framework

The demographic profile of the respondents in terms of:

➤ Sex
➤ Frequency of Facebook usage
➤ Personality Type

➤ Attitude of the respondents towards Facebook utilization for spreading depression awareness.
➤ Perceived behavioral control of the respondents on Facebook utilization for spreading depression awareness.

Help-seeking behavior of Grade 12 students of Emilio Aguinaldo College-Cavite

The figure shows the conceptual framework of this study. The diagram represents the grade 12 student's demographic profile in terms of sex and personality type. This study limits on attitude of the respondents, perceived behavioral control of the respondents and behavioral intention of the respondents. This study involves two types of personality, the introvert and the extrovert. According to Surbhi (2019), when the person is reserved and does not open up easily, he or she is said to be an introvert. On the contrary, when a person is social, talkative and makes friends quickly, then his or her personality type is extrovert. The goal of this study is to know the Facebook utilization for spreading depression awareness; impact on help-seeking behavior among grade 12 students of Emilio Aguinaldo College-Cavite. The participants posit to answer the questions given by the researchers. The researchers used a selfmade questionnaire. The questionnaire will be divided into three (3) parts composed of; (1) Student demographic profile; (2) Facebook utilization for spreading depression awareness; (3) the impact of help-seeking behavior among grade 12 student of Emilio Aguinaldo College-Cavite.

Significance of the Study

It is important to consider the perception on Facebook utilization for spreading depression awareness; impact on help-seeking behavior of grade 12 students of Emilio Aguinaldo College-Cavite and the basic features of Facebook and it is even more essential to consider how the platform is actually being used and by whom it is used. The purpose of this study is to investigate the relationship of perception on Facebook as a tool for spreading awareness and impact of help-seeking behavior. The respondent's help-seeking behavior and to know the perception on Facebook of the respondents as a tool for spreading depression awareness has relationship to impact of help-seeking behavior of selected grade 12 students of Emilio Aguinaldo College-Cavite.

Participants. This study will benefit the participants of the study to be able to know how to use Facebook to be aware and to spread depression awareness. The participants will able to know the help of Facebook features like Facebook page, Facebook memes and etc. to help people who experience depressions. All this Facebook features will help to spread awareness.

School. The result of this study can provide the school a knowledge about the Facebook utilization for spreading depression awareness; impact of

help seeking behavior for their students having this knowledge, the facilitator, teachers and staff will be given a better ideas and how to properly manage them and to be more effectively and how to supervise their students.

Guidance Counselor. This study can give the guidance counselor some additional ideas about Facebook utilization for spreading depression awareness; impact of help-seeking behavior it is because depression awareness plays a significant role in emotional and growth of adolescents.

Society. It will impart knowledge to the society on how to use Facebook features in positive manner and also impart the knowledge on what is depression and how to deal with it.

Parents. The parents will be able to know the positive side of Facebook utilization in terms of help-seeking behavior of their children. It also helps the parents to guide their children and be able to access themselves of their behavior by using Facebook and how can it affect others and how to deal with them.

Facebook Pages Admin. This study will provide awareness to the admin on what approach they need to do in order to give social support to people who seeking help from their Facebook pages.

Future Researchers. This study will provide base line data needed for the future researchers and studies related to this research. This study can serve the future researchers more information and more ideas about the Facebook utilization for spreading depression awareness; impact of help-seeking behavior particularly in students and adolescents. The future researchers can use this as one of their knowledge to provide a better result not only for them but can also open in the development of this study.

Scope limitation of the study

This study has three (3) variables which are the Facebook utilization, Depression Awareness and the Help-seeking behavior. It was primarily focuses to determine the perception of the respondents on Facebook utilization for spreading depression awareness. How the respondents used Facebook to seekhelp? The significant relationship between sex and Facebook utilization of the respondents, significant relationship of personality type and Facebook utilization and the significant relationship between the perception of the respondents on the role of

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Facebook in spreading depression awareness and help-seeking behavior of the respondents.

This study limits its exploration on using Facebook as website, depression as a mental health issue and help-seeking as a way for respondents to cope on depression. This study was consists of 304 grade 12 students of Emilio Aguinaldo College-Cavite S.Y. 2019-2020. And it involved students which are normally experience a feeling of sadness, pressure and loss interest in activities. It can affect on how the students or teenagers think feels and behaves and it can cause emotional, functional and physical problem.

The chronic feelings of sadness and low mood they experience may have been around for so long that they feel normal. However, it is not normal to go through life feeling unhappy all the time. Everyone experiences occasional bouts of low mood in response to sad or stressful life events (Schimelpfening, 2019).

This limits the used of Theory of Planned Behavior to attitude, perceived behavioral control and behavioral intentions of the respondents to engage and seek-help on Facebook to deal with sadness, pressure and loss of interest in activities that may lead to depression. And it also used the Uses and Gratification Theory on Facebook utilization of the respondents to know why they engage on Facebook and what they do on Facebook. This study involves two types of personality the introvert and the extrovert only. According to Surbhi (2019), when the person is reserved and does not open up easily, he or she is said to be an introvert. On the contrary, when a person is social, talkative and makes friends quickly, then his or her personality type is extrovert. The demographic profile was only consists of sex, frequency of Facebook usage and personality type only.

The study took place at Emilio Aguinaldo College at Congressional East Avenue Burol Main, City of Dasmariñas, Cavite as their partner institution for the study to be convenience and more accessible.

Definitions of terms

The following terms are hereby defined operationally and conceptually for the readers to understand better the study.

Adolescence. A crucial period for developing and maintaining social and emotional habits important for mental well-being of the participants.

Awareness. The knowledge of the participants about depression.

Behavior. The behavior of the participants towards Facebook utilization for spreading depression awareness and what are the impacts on help seeking attitude of the participants.

Depression. It causes feelings of sadness or a loss of interest in activities of the adolescence.

Facebook. It is a website that the participants can use to spread news, quotes and it is use as a channel to communicate with family and friends. You can also share your thoughts a feeling by posting it into the wall of your facebook account. It also campaign material that contains one or more ad sets and ads. You will choose one advertising objective for each of your campaigns. A Facebook page, it is public profile specifically created for businesses, brands, causes, awareness campaign and other organizations. Friend request, a request sent to a person on a Facebook to be their friends. And hashtags that used to share their feelings and to get empathy and sympathy from other people.

Help seeking. The participants use Facebook to seek help about depression

Impact. It pertains on how the participant will benefit on using Facebook.

Memes. A lifestyle and art used by the participants who are willing to actually live a life that doesn't include depression.

Mental illness. Depression that is involved in this study is a type of mental illness.

Perception. The realization of participants on Facebook utilization for spreading depression awareness.

Social media. A form of electronic communication which facilitate interactive based on certain interests. Social media include web and mobile technologies such as computers and mobile phones.

Social Networking. This is the use of internet to share information about yourself available to other people especially people you share an interest

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with. The essence of social networking is to share idea and exchange message.

Attitude. The attitude of the respondents in using facebook.

Wholesome memes. A positive quotes that can share through Facebook to spread positive vibes and awareness about depression.

REVIEW OF RELATED LITERATURE

This chapter involves the review related literature and writing of recognize experts which have significant bearing or relation to the problem of the study. It is composed of foreign and local studies that the researchers gathered from Newspapers, journals, online articles and websites to help clarify this vital component of this research paper. This chapter also contains the synthesis and gathered literatures.

Foreign Related Literature

Depression

WHO (2017) has defined depression as a pathological state that is associated with feelings of loss or guilt and characterized due to sadness, lowering of self-esteem, disturbed sleep or appetite, feelings of tiredness, and poor concentration. Clinical depression can be diagnosed by the duration and severity of sadness. Normal sadness or Short-lived feelings of depression which do not result in impaired functioning are not clinical depression. The previous research showed that depression is associated with factors such as lack of an intimate partner, paid job, few years of formal education, difficulty in performing basic or instrumental activities of daily living, presence of comorbidity, lack of consultation about household decisions, occurrence of violent incidents or accidents, loneliness, and a low household socioeconomic status. (FernándezNiño, et al., 2014) 7 Smeltzer, et al (2010) include some specific symptoms related to clinical depression and those symptoms are feelings of sadness, worthlessness, fatigue, guilt and difficulty concentrating or making decisions and other common symptoms change in appetite, weight gain or loss, sleep disturbances, and psychomotor retardation or agitation (Smeltzer, et al., 2010). Stuart (2013), called major depression when at least five essential features as symptoms that present during the same 2-week period. Symptoms are including depressed mood, loss of interest,

weight loss, insomnia, psychomotor agitation or retardation, fatigue, feelings of worthlessness, diminished ability to think and recurrent ability to death. It is considered as a single episode or recurrent.

The universal trend towards the prevalence of depression is double among women than among men and the ratio is 2:1 between these two sex groups. Other risk factors for depression were family history of depression or alcoholism; experiencing disruptive, hostile, and the generally negative home environment in childhood; recent shocking events like deaths or losses; lacking an intimate, confiding relationship; and having had a baby in the past 6 months. Research has also shown the high occurrence of depression among patients who took admission to the hospital for medical illnesses. Health care personnel do not recognize these depressions and therefore they do not treat them. Majority patients with severe medical illness suffer from depression, although the intensity and frequency of depression are higher in patients with severe illness. Available studies suggest that up to one-third of hospitalized patients claim mild or moderate symptoms of depression and nearly one-fourth of medical inpatients can suffer from a depressive illness. Some medical illnesses are frequently related to depression, especially cancer, strokes, epilepsy, multiple sclerosis, Parkinson`s disease, and a variety of endocrine disorders. Thus, research gives the recommendation that depression is a common accompaniment to many major illnesses (Stuart, 2013).

Depression in Teens

According to Mental Health America (2019) it's not unusual for young people to experience "the blues" or feel "down in the dumps" occasionally. Adolescence is always an unsettling time, with the many physical, emotional, psychological and social changes that accompany this stage of life. Unrealistic academic, social, or family expectations can create a strong sense of rejection and can lead to deep disappointment. When things go wrong at school or at home, teens often overreact. Many young people feel that life is not fair or that things "never go their way." They feel "stressed out" and confused. To make matters worse, teens are bombarded by conflicting messages from parents, friends and society. Today's teens see more of what life has to offer — both good and bad — on television, at school, in magazines and on the Internet. Teens need adult guidance more than ever to understand all the emotional and physical changes they are experiencing. When teens' moods disrupt their

ability to function on a day-to-day basis, it may indicate a serious emotional or mental disorder that needs attention — adolescent depression. Parents or caregivers must take action.

Teen's perception about Social networking sites

The use of social networks has changed the form of relationships and ways of communication. Social networking sites offer services to their users, such as the creation of personal page, where they can share personal information, and experience, upload photos, make new relationships and organize social events, learn about other people lives as well as press their own idea. Pounders, Kowalczyk, Stowers (2016), claim that teens post selfies to gain social acceptance and boost their self-esteem, through the number of likes they receive.

Facebook

According to Margaret Rouse, Facebook is popular free social networking website that allows registered users to create profiles, upload photos and video, send messages and keep in touch with friends, family and colleagues. The site, which is available in 37 different languages, includes public features such as events that allows members to publicize an event, invite guest and track that plans to attend. Pages that allow members to create and promote a public page built around a specific topic, presence technology that allows members to see which contacts are online and chat. Facebook being social networking sites provides an online platform on which students create profiles, promote and share information and contents and have interactions with contacts both known and known (Kirkpatrick, 2010). Facebook has expanded recently, which have led to its use by people of all generations extensively.

Use memes to cope up with mental struggle

Humor is a well-known, effective coping strategy, and it enables to raise awareness of the society about issues that many would rather not speak about, including mental illness. Memes and digital communities around them provide a safe, although not always productive space to deal with depression and anxiety. Nevertheless, the Internet meme culture has contributed to opening up an honest conversation around mental health. This can potentially lead to a better awareness and network of support—one that the preceding generations could not afford to create. Humor is

contagious. When someone's laughing, it's kind of viral and it can spread a positive message to the community.

Memes related to mental health appear to fit into this convention. The way it is achieved is chiefly through embedding serious themes in light-hearted, absurdist, often campy imagery and text. Most memes of that kind seem to consist of two "layers": one is positive, but in an ostensibly artificial or childish way, and only serves as an absurdist cover-up for the second layer. The other part is an honest description of personal hardships and is the actual underlying content of the meme.

Memes usually describe the daily struggles of people suffering from depression—fatigue, feelings of powerlessness, unhealthy habits such as excessive sleeping, or binge eating. Often, they describe difficulties in interactions with people who don't have awareness about mental health issues (Konrad Krawczyk, 2017).

Wholesome Memes

Wholesome memes are unapologetically positive memes meant to be uplifting. They often reappropriate previously established meme formats to share love, positive messages, healthy coping mechanism, cute animals and more. In light of all of the negativity and hate that exist on the internet, wholesome memes are refreshing alternative, a reminder that there is hope, even in troubling and uncertain times; wholesome memes that promote positive mental health can be found in Facebook group, on twitter and through hashtags like #wholesomememes.

Both brutally honest memes about mental illness and wholesome memes have been louded by fans as tools for working through hard times. Memes cannot replace therapy and other important treatments for mental illness, but they can provide methods for healing and /or warm and fuzzy boost (Sommer, 2018).

Social Media Helps People with Depression a Voice to Breaking Down Stigma

Depression, which affects one in five people at some point in their life, can be an incredibly isolating illness. Aside from the fact that one of the symptoms of the illness is that communication and socializing is hard,

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there is a huge stigma in society that stems from a lack of understanding about it. Although this has created a perfect storm - no one feels able to talk about it and no one understands it because it isn't being talked about - social media is providing a catalyst and conduit for people to break down perceptions around depression, and finally explain how they feel. Over the past few years, various campaigns - spawned by both charities and the public - have utilized pictures and selfies to help open up discussions surrounding mental health.

In October 2015, people took to Facebook, Instagram and Twitter to share medication selfies in a bid to fight stigma surrounding mental health. This year, to coincide with Depression Awareness Week, depression support organization The Blurt Foundation has launched a #WhatYouDontSee campaign to educate the public that people with depression don't "look" a certain way. Founder Jayne Hardy, who also has depression, says: "Again and again, members of our community tell us they've been told they don't 'look depressed', that they can't be ill because they've been spotted smiling, that they're too young/old/pretty/smiley/privileged to be depressed, and so on." "We're so over hearing comments like this. Depression can hit anyone, at any time, regardless of age, gender, and personal circumstance. "You can't tell from the outside who is suffering, because depression can't be seen."

The campaign encourages people to share 'mhelfies' – pictures of themselves, as someone affected by mental health issues – with a caption explaining what others can't see.*   One of the most successful social media campaigns from last year was #MedicatedAndMighty, which was started after mum-of-four Erin Jones shared a photo of herself on Facebook holding a prescription for anxiety pills. According to mental health charity Mind, four out of five people feel that talking about their mental health problems helps, which suggests campaigns like this could do a lot of good. The hope is that sharing this information so boldly and visibly directly challenges the stigma around mental health (Hinde, 2016).

Seven Facebook pages that help with depression

Facebook is normally a place where we get lost in the noise, looking through old photos of friends we lost touch with and also spending countless hours just scrolling through our news feed. But is also a tool we can use to help us with our depression. From depression support groups, to chatting people suffering with depression, or more simply follows

Facebook pages that raise awareness for depression. There are pages look to break the stigma surrounding mental health and depression and also support you on your recovery.

1in4 is a page that shares quotes and resources around mental health in general, but has a strong emphasis on depression. The page was set up by Tom Wavre with an emphasis on the fact that 1 in 4 people will suffer with 1mental illness in any given year, and their aim is to help reduce the stigma around mental health.

Depression on the mighty. The mighty do some great work raising awareness and offering help around mental health. Unlike a lot of popular publications, they don't share the odd mental health post every now and then. Instead, they have a variety of pages on Facebook set up for different purposes. Anxiety on the mighty, Eating disorder on the mighty and of course, Depression on the mighty.

With regular updates to article raising awareness and offering help for depression to short, hard hitting videos, the consistency and high quality content really caught your eye.

I support people who suffer depression. What caught your attention with this page is the live streams and videos from Mathew Baker and also the messaging service they provide.

Depression awareness set by John, this page was set up to help people with depression feel less alone. He strongly believes that every like, comment and share with each post around depression can help fight the stigma.

Depression memes, it is a slightly different one, memes based around depression. Depression isn't a laughing matter, but these memes are highly relatable if you are suffering. Reading through some of them, you will almost chuckle to yourself and shout "That's me".

And lastly, depression and anxiety warriors, this page was set up for everyone battling depression and anxiety every day. It will give you a platform to discuss your thoughts and stories around depression (McGregor, 2018).

#WhatYouDontSee Hashtag, a Real Talk about Depression

A major reason so much stigma surrounds mental health is that you can't "see" depression, anxiety, or any other mental illnesses the way you can "see" when someone has a cast on their arm. Although we still have a long way to go, social media has proved to be an awesome platform for people to speak out against this stigma and talk about what it's really like to have a mental illness. That's why Blurt, a depression awareness organization, took to Twitter and Facebook and asked people to share their own experiences with depression using #WhatYouDontSee (Raiola, 2016).

Evaluation of an Online Campaign for Promoting Help-seeking attitudes for depression using a Facebook advertisement

Mental illness is a substantial contributor to the global burden of disease. However, mental illness remained under diagnosed in many people, and many of them receive minimal to no treatment for their illnesses. From the health policy perspective, one way to tackle the under diagnosis problem is to deliver mental health campaigns for promoting acceptance, enhancing knowledge and encouraging help-seeking behavior. According to World Health Organization, selective preventive intervention program targeted at specific groups, such as school children, adolescents and elderly person can reduce depression. Some campaigns have been developed to address stigma or cultivated positive attitudes toward depression and its treatments.

Along the same time, some research finding suggest that an increase in mental health literacy can affect one's help-seeking intention. According to the findings of a systematic review of 22 studies, mental health literacy is listed as one of the important factor s for strengthening help-seeking intentions for mental disorders among adolescents. Help promotion campaigns delivered through the internet have become increasingly more common recently. The internet is one of the major platforms for the public to seek health information and resources because of its convenience and anonymous nature. Online campaigns, through the use of website, online forums and social media in particular, enable reaching diverse populations and providing motivation through reminders and feedback to the participants. They can also mimic interpersonal communication to advocate health-related behavior changes. In a meta-analysis of 85 online intervention studies, online campaigns were found to be helpful for physical health behavior changes with statistically significant

effects, especially when grounded in theory of behavioral change like the theory of planned behavior (Alison Hui et al., 2015).

Help seeking intention and help seeking attitude

Help-seeking intentions are assumed to be one of the major determinants of help-seeking behavior, using help-seeking intentions as an index of bona-fide help-seeking has become broadly accepted among researchers. According to the theory of planned behavior (TPB; Ajzen, 1991), behavior is mainly determined by behavioral intentions. Armitage and Conner (2001) reviewed the literature on TPB and concluded that behavioral intentions do predict behavior. On the basis of these results, the factors influencing help-seeking intentions have also been considered to predict help-seeking behavior. Nevertheless, help seeking intentions are not equivalent to help-seeking behavior. Although measuring help - seeking intentions has certain advantages, it is necessary to distinguish between help-seeking intentions and actual help-seeking behavior.

Personality traits effect in Facebook

Personal traits may play significant roles in the usage of Facebook of university students. According to Ryan and Xenos (2011), Facebook user's students may be extroverted. According to the findings of the research entitled the relationship between Facebook use and personality traits of the university students the Facebook users are possibly the individuals who developed the feeling of loneliness in their families, on the contrary those are not users of Facebook may be inclined to be scrupulous, timid and unsocial. Their finding shows that every personal trait is related with the certain type of feature of Facebook. As an example, extroverted students used and stay longer than the introvert ones. On the contrary, as an anxious and shy people are frequent users of Facebook like extroverts but have fewer friends comparing with them (Yesil, 2014). According Junghun and JOng-Eun, reveals that getting social support and self presentation have an indirect positive relationship. If the student presents himself honestly in his Facebook profile page there is a possibility of obtaining social support from Facebook users.

Introverts Love Facebook and Extroverts Hate It

Everything about Facebook serves the emotional and psychological needs of introverts. It gives them a place to socialize and

chat with people they like, without having to deal with the elements of in-person dialogues that make them uncomfortable. It allows them to say their piece, without being interrupted, scowled at, or patronized. Extroverts, on the other hand, often despise everything about Facebook. The facial cues, the back-and-forth banter and the physical contact are all missing. In fact, it's often the extrovert who expounds upon the tragedy that social networks and smartphones are causing to society and interpersonal relationships (Dube, 2015).

The Psychology of Introverts

According to the study started in 1989 by Dr Jerome Kagan, researchers found that infants and toddlers who were hypersensitive to external stimuli, typically grew up to be quiet, reserved and thoughtful introverts. "The higher the degree of 'hypersensitivity' an individual experiences towards sights, sounds, smells, and the closeness of other people, the more likely it is that those same individuals will seek to avoid them. Hypersensitivity both creates and explains why introverts hold such a strong preference for seeking out quiet, serene and unpopulated spaces in which to live and work." It is for this very reason that the experience of using Facebook appeals so much more to introverted people. From the quiet comfort of your own home, you can enjoy a virtual "party" with friends and family. You can exchange witty jokes, play online games together, and even dive into a long and very intimate instant chat with loved ones. You can do all of that without having to endure a voice blasting into your ear from a telephone, without the distractions and background noise of an actual in-person party, and without the danger of an extrovert jumping into the conversation, tossing you aside, and taking over.

Extroverts Don't Use Facebook as Much as Introverts

Introverts love Facebook much more than extroverts is the fact that they use it more. Late last year, Dr. Pavica Sheldon at the University of Alabama in Huntsville conducted a study on this very topic, which she published in the Journal of Psychosocial Research on Cyberspace. In that study, she found that while extroverts may be more active on Facebook, Introverts actually use the social network for much longer periods of time than extroverts. In other words, even though the extroverts who are there tend to try to steal the limelight (just like they do in real life), Facebook is actually utilized much more by introverts. The reason is because Facebook appeals to an introverts desire to control who they interact with,

and how that interaction takes place. Unlike in-person environments where introverts often feel like they have no control over interactions. This is especially true on Facebook, where you can make your status updates visible only to the family and friends who you've accepted into your list of Facebook "friends". You can tell Facebook not to show you updates in the news stream from people you find annoying or rude. If someone is obnoxious when commenting on your Facebook wall, you can simply remove them as a friend, and you never have to see or hear from them again. For introverts, this is a dream come true.

Gender Differences in Using Social Networks

Females use Facebook for maintaining existing relationships, academic purposes and following agenda higher than males while males use it for making new relationships at a rate higher than the females. These findings show that males use social networks mostly for making new friends and relationships whiles females use it mostly for finding their old friends and keeping in touch with the existing ones.

This finding is in line with Tufekci (2008), study which shows the significant differences between males and females on the usage of social networks that females are more likely to use social networks to find potential friends and find people with have similar interests.

Thelwall (2008) and Lenhart & Madden (2007, found that males tend to make new relationship in social network environments more than females do. On the other hand, Korkut (2005), found that females communication skills are more positive than males and he explained this by suggesting that females are sociable than males.

Local Related Literature

Social networking sites let individuals to present themselves and begin or keep connections with others. The extremely popular social network site for student's indifferent levels, Facebook, has already printed a big impact on their lives. The site can be used towards work-related contexts, romantic relationship commencement and connecting those with shared interests. Members may use the site to mingle with people they already know offline or to find new friends. Facebook permit s its users to present themselves in an Internet profile, build up "friends" who can post comments on each other's walls, and view each other's page. Facebook

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associates can also join groups based on common interests, see what things they have in common, and learn each other's' hobbies, interests, favorite music, and romantic relationship status through their pages. But what are behind these facts? What does Facebook bring to the lives of the members especially to the students? How does Facebook affect the life of a student? According to studies, Facebook has an impact to students. Some students are using it for educational purposes. Students would like to do some online collaboration with classmates. It is said that using Facebook boosts students' self-esteem even more.

They would feel belongingness in the community compared to those who do not have accounts. It also provides news on what are happening in the real world and even in their school campuses. On the other hand, negative effects flourish. It was found that social networking sites have formed a new kind of addiction which we called the "social media addiction" and it is quite true in using Facebook. Are you addicted to Facebook? Some would say "yes" and some would say "no". It depends on the level of cravings. But in the recent study, it was found that a lot of students are by now addicted to it, to the extent that their school performance is affected. "Children who spend much of their time online find it harder to focus in class and have short attention span "researchers found through the samples that 7 out of 10 teachers believed that their students are becoming obsessed with social media sites such as Facebook. Their students tend to study while using Facebook and it shows that they got 20% lower grades. Facebook-using students even perform task (projects or assignments) without completion for the reason that they spend more time scrolling down on their newsfeed to see updates about their friends and look up for their notifications rather than finishing their school tasks. Aside that Facebook affects students' academic performance; it also has an effect on students' emotional health. Yes, students feel connected to others but study shows that they manifest depression through seeing their status updates. Some would utilize the site to express what they feel towards their enemy in school or even outside the campus. They would blurt out through posting status that would target their opponent just to hurt their feelings. With the rampant use of all the social networking sites, students are coming loose to the real associates. Facebook chats and posts would make them busy nowadays. They may be connected to many people but they somehow disconnect with the important aspects of their lives and one of those is education. The belief of meeting people face to face seems very odd. Students prefer to

send and receive instant messages or post messages through Facebook. Many other elements could be the reason for the inattention in studies of students. But somehow social networks like Facebook have a negative impact on the education of some students. Facebook could make students vain for better or for worse and it is the parents' obligation to watch and guide their children to get the utmost good benefits from Facebook.

Filipino Americans and Mental Health Help-seeking

The case of Filipino American – the second largest Asian ethnic group in the United States (Barnes & Benneth, 2002) continues to raise questions regarding the facilitators that may play a role in their mental health help-seeking attitudes and behaviors. One of the more consistent findings in Asian American psychology research is that as low as the rate of mental health help-seeking is among Asian American, Filipino Americans seek mental health services at a much lower rate even compared with other Asia group (Gong & Tacata 2003).

Filipino American adolescents have one of the highest rate of suicide ideations and attempts in the United States, with the Filipina American adolescents having the highest rate of suicide ideations among racial and ethnic groups (Wolf, 2006).

Filipina American adolescents also have a higher depression rate than other Asian American female adolescents (Kim & Chun, 2004).

Social Media and its Deep Connection to Mental Health Issues

According to WHENINMANILA CONTRIBUTOR (2017), in a social media world full of disinformation, toxicity, and negativity, it's no wonder that mental health issues continue to grow among the youth in a country so involved and active in the chat rooms, newsfeeds, and forums of the vast data and information hub that is the social media world. With the growing movement towards ending the stigma against mental illness and promoting awareness and support for the hundreds of thousands of Filipinos suffering from mental health issues, and especially with the youth at the forefront of this crusade, we have seen milestone legislation like the Mental Health Act of 2017; yet as we await the greater rewards of this success, the struggle to promote mental health awareness and wellbeing continues. For the members of INTROSPECT, a likeminded mental health youth organization, the movement for mental health is both an offline and

an online struggle especially with the increasingly toxic environment of the country's social media networks, the rise of cyberbullying cases, and online disinformation and defamation causing many of our netizens to experience "social media depression," a phenomenon linking various mental health issues including anxiety and depression to excessive social media use and exposure to online toxicity. More than anything though, social media is also an opportunity to look into and reflect upon, INTROSPECT invites us to look behind and beyond our screens to see what we do on social media, how it affects our mental health and others', and what we can do online and offline to help build a more inclusive, supportive, and positive online space. The connections that we, the youth, make online give us a unique power to influence and shape our online spaces. We, too, are social media influencers in our own corners of the online world; we, too, are responsible for disrupting the current waves of negativity trending in our online spaces, and we too are stakeholders in the mental wellbeing of our communities on and offline. Behind and Beyond the Screen is INTROSPECT's pilot social media depression awareness campaign aimed at bringing the youth, particularly university students together to discuss and come up with solutions to reduce the negative mental health impact of social media depression in the youth today, as they're guided and oriented not only by online personalities and influencers, but medical professionals and health educators in developing solutions and policies to promote mental wellness through responsible social media use. By asking us to looking deeper into our social media use and online activity, INTROSPECT hopes to take us beyond just mental health advocacy, towards using social media as a tool and a weapon in the movement for mental health by creating online safe spaces, promoting responsible social media use, and ultimately creating a sense of shared responsibility to care for the wellbeing of our online communities. INTROSPECT challenges us now: to become positive social media influencers as well as mental health movers.

Mental health in the Philippines

According to Phil star (2019), The Philippines passed the Mental Health Act, which is meant to help protect the rights and welfare of people with mental health conditions, shift focus of care to the community and improve access to services, in June 2018.

The Palace, commenting on the passage of the law, said that the implementation of a mental health policy "will help neutralize the stigma attached to mental illness."

Sen. Risa Hontiveros, one of the authors of the bill, said then that the law will help provide mental health services to barangays and "integrate psychiatric and psychosocial and neurologic services in regional, provincial and tertiary hospitals, improve our mental healthcare facilities and promote mental health education in our schools and workplaces."

Awareness of mental health issues is not widespread in the Philippines, where conditions like depression is sometimes made fodder for jokes and insults.

In September 2018, mental health advocates called out video blogger Drew Olivar remarked that students of the University of the Philippines should kill themselves to thin their numbers. The comment had been addressed to UP students critical of the government.

"It is but just to demand that we give the topics suicide and self-harm the appropriate seriousness and sobriety they deserve," Raymond John Naguit, national chairperson of Youth for Mental Health, said then. Youth for Mental Health was among the advocacy groups that pushed for passage of the Mental Health Act.

Synthesis

The related literature involve in this study has a significant relation to the given variable in the sense that it give important point of interpretation and information regarding Facebook utilization for spreading depression awareness; impact on help-seeking behavior in adolescents. Specifically that the adolescents are used on spending much more time scrolling their Facebook page.. Through Facebook adolescents can read and share memes about depressions. Using Facebook, adolescents can use some hashtags when they experience depression and the other people who also used those hashtags can share their thoughts, feelings, empathy and sympathy to the people who is also experiencing depressions. Facebook also have Facebook page where you can gather all people who experience depressions and there they can also share their

own experience. There they can read stories about depressions and they also had a motivation quotes to fight against depressions.

Depression is more than just slow mood; it is a serious condition that affects your physical and mental health. Facebook is one of the most popular website in the world and it can help people who experience depression. We can use hashtags like #WhatYouDontSee, #MedicatedAndMighty. It also involves the help-seeking behavior of adolescence meaning how adolescence seek help to their Facebook friends and also to anonymous person when they need social support when they are experiencing depression.

METHODOLOGY

This chapter involves the research method used in obtaining data. With primary content includes the research design, research participants, sampling technique, research instrument, research locale, and data gathering procedure, the module development and validation schedule of intervention and formulas.

Research Design

The study utilized a Quantitative Research in which the Researchers-made Questionnaire has been used as the gathering tool. Quantitative methods emphasized objective measurement and statistical, mathematical, or numerical of data collected through questionnaire. According to Gay, Mills and Airasian (2009), Quantitative research relies on the collection and analysis of numerical data to describe, explain, predict, or control variables and phenomena of interest.

The researcher used a descriptive, inferential statistics and correlation form of design. Descriptive is a method that describes the characteristics of the population that is being studied. This methodology focuses more on the "what" of the research subject rather than why of the research subject.

Descriptive is used for frequencies, averages and the statistical calculations. Often the best approach prior to writing descriptive research is conducting survey investigation. This method is used to gather information in order to test hypothesis or to answer questions concerning status of the subject of the study (Calderon, 2008).

Inferential statistics use a random sample of data taken from a population to describe and make inferences about the population. Inferential statistics are valuable when examination of each member of an entire population is not convenient or possible (Stephanie, 2014).

Correlation research design is used to explore the relationships or links between variables. In correlational research, the researcher does not have control over or manipulate either variable. The role of the researchers is to gather the data and determine if there is a pattern that indicates a correlational relationship between the variables.

Correlational research is concerned with establishing relationships between two or more variables in the same population or between the same variables in two populations (Leedy and Ormrode, 2010).

Correlational research method is used in the study as they obtain information from the respondents about the Facebook utilization for spreading depression awareness and impact of help-seeking behavior among the respondents.

Research Locale

The study has been conducted in Emilio Aguinaldo College Cavite, a private school located in Congressional East Avenue, Barangay Burol Main, City of Dasmarinas Cavite. The researchers were currently studying at the said school. Emilio Aguinaldo College Cavite is a home for students from a diverse background to grow educationally, get involved and have a meaningful senior high school and college experience. The total population of Senior High School students in Emilio Aguinaldo College is 1, 448. The researcher chose Emilio Aguinaldo College-Cavite because it is more accessible for them and the data they gathered can be used by the guidance office as a data for SHS students.

Research Participants

The participants in this study are adolescence. The respondents were the selected 304 Grade 12 students of Emilio Aguinaldo College Cavite School Year 2019-2020. Adolescence is a stage of a human development that occurs between childhood and adulthood. Adolescence is generally viewed as a stage where young people experience rapid

growth of their body and mentality to full maturity during 12-25 years of age (Liu 2014).

Sampling Technique

This study used simple random sampling. It is the basic sampling technique where we select a group of subjects (a sample) for study from a larger group (a population). Each individual was chosen entirely by chance and each member of the population has an equal chance of being included in the sample. Every possible sample of a given size has the same chance of selection.

According to Hayes (2019), a simple random sample is a subset of a statistical population in which each member of the subset has an equal probability of being chosen. A simple random sample is meant to be an unbiased representation of a group. Because individuals who make up the subset of the larger group are chosen at random, each individual in the large population set has the same probability of being selected. This creates, in most cases, a balanced subset that carries the greatest potential for representing the larger group as a whole, free from any bias.

This study used the Raosoft sample calculator. According to Nwachukwu (2015), The Raosoft sample calculator is basically software that primarily calculates or generates the sample of a research or survey. Estimating a sample size for a survey, project or research can be confusing and frustrating, as a result, the Raosoft sample size calculator offers both sample size confidence interval calculation to minimize these frustrations encountered during research. This software takes into account the margin of error, the confidence level and response distribution. It also offers to show viz-a-viz what the margin of error would be like with various sample sizes.

Sources of data

To help the researcher accomplish the aim of the study, they turned to these sources of data that served as a support in their research.

The researchers gathered their primary data the researchers-made questionnaire from the answers of the participants which are the Grade 12 students of Emilio Aguinaldo College-Cavite.

For the secondary source of data, various previous studies, journals, articles, books, and web researchers was used to help in the explanation of certain concepts in the subjects of the study.

Research Instrument

The researchers developed the instruments that were used in this study in consultation with experts in order to ensure content related validity. Moreover, reliability of the instrument was also checked with the help of the researcher's adviser.

The self-made questionnaire called FUDA IMHESEBE Questionnaire was used to gather all the necessary information. It provides the researcher's much needed information for the study.

The FUDA IMHESEBE Questionnaire for the grade 12 students of Emilio Aguinaldo College-Cavite was composed of three parts; Part I contains the Demographic Profile of the participants contains three (3) questions about their sex, frequency of usage and personality type.

Part II is the questionnaire made with 20 questions that measured the perception on Facebook utilization for spreading depression awareness.

Part III is the questionnaire was made with questions that measured the impact of help-seeking behavior among the participants.

Range	Verbal Interpretation
1.0 – 1.75	Strongly disagree
1.76 – 2.50	Disagree
2.51 – 3.25	Agree
3.26 – 4.0	Strongly agree

Validity of Instruments

For further discussion of validating the data instruments, the researchers utilized a theoretical approach to test construction. This approach demands only a willingness to judge the apparent quality of a measure based on its correspondence with the theoretical definition and understanding of the target construct.

Specifically, content validity was utilized in this study, because theoretical understanding guides theoretical test construction, following this approach would expect to yield measures with strong content validity.

The researcher first consulted the adviser's expert opinion for him to know the accuracy of his data.

After that, the researcher turned to the checking of the readability of the content of his data instruments. It is the way of analyzing the format, spelling, meaning, and other possible technicalities.

Subsequently, the self-made survey questionnaire was validated by the Institutional Review Board. This may compose of three experts; a Licensed Professional Teacher, Registered Psychometrician or a Registered Psychologist.

Then, the approved data instruments were undergone pilot testing, to ensure the rationality and content validity of data instruments. For the final procedure, the results of pilot testing reflected the readability of the data instruments. In this way, the researchers find out the possible statement that needs revision.

Reliability of Instruments

For the reliability of data instruments, pilot testing was also be utilized after the validation of the instrument to ensure the consistency of the data.

Using the Cronbach Alpha, the internal reliability value for the Facebook Utilization for Spreading Depression Awareness is (0.788), which means it is accepted, and for the Impact on Help-Seeking Behavior, it resulted (0.862) as good.

After that, analysis of data instrument was scrutinized; it is a way of resolving complex expressions into simpler ones.

Revising of the data instrument was also employed in the study. It is a preparation of the reliability of the final data instrument that will be answered by the participants.

Data Gathering Procedure

Firstly, the researchers consulted their thesis adviser and their technical critic before gathering data. The questionnaire of this study was validated by three experts; a Licensed Professional Teacher, Registered Psychometrician or a Registered Psychologist.

Then researchers conducted a pilot study to test the reliability of survey questionnaire using the Cronbach coefficient alfa. The researcher provided a letter of request to the principal of Emilio Aguinaldo Cavite Senior High School to gather information from grade 12 students regarding the study.

The researchers conducted a room-to-room survey and used the simple random technique for Grade 12 students of Emilio Aguinaldo College Cavite. The researchers gave half an hour to answer the questionnaire. After the researchers retrieved the survey questionnaires; it was tallied, tabulated, data analysis and interpret.

Reason (2015), defines a questionnaire survey as a formalized list of questions that are uses to solicit information from respondents. For this research, the researcher made use of structured questions to gather necessary data. Structure or closed questions were meant to save the respondent's time and get definite answer. The questionnaire survey also provided greater uniformity across research situations as respondents respond the same standardized questions.

Data Analysis

For the interpretation of data, the researchers used descriptive, inferential and correlation statistical analysis. For the descriptive statistical analysis percentages frequency tables and some basic tables and graph was used to present the data. The inferential is used to make predictions from the data. With inferential statistics, the researchers take data from samples and make generalizations about the population.

And for the Correlation statistical analysis the researchers used Pearson's r by Karl Pearson, it measures the strength between variables and relationships. In the statistics, this formula is often referred to as the Pearson R test, when conducting a statistical test between two variables;

it is a good idea to conduct a Pearson correlation coefficient value to determine just how strong the relationship is between those two variables.

According to Kenton (2018), Pearson r is a type of correlation coefficient that represents the relationship between two variables that are measured on the same interval or ratio scale. The Pearson coefficient is a measure of the strength of association between two continuous variables.

The variables such as sex, frequency of Facebook usage, personality type and relationship among others variables which will be calculated by using SPSS software.

Formulas

1. Frequency and percentage distribution.

Frequency distribution is a representation, either in a graphical or tabular format that displays the number of observation within a given interval. The intervals must be mutually exclusive and exhaustive, and the interval size depends on the data being analyzed and the gals of the analyst. (Kenton. W., 2018).

% = F/n X 100

Where:

F = number of items the number occurs (frequency)

N = total number of respondents

2. Percentage

A percentage is another way of expressing a proportion. A percentage is equal to proportion times 100. (Oxford dictionary, 2011)

%= Frequency x 100/N

Where:

Frequency = Number of respondents

 % = Percentage

N = Total number of population

3. Weighted Mean.

The weighted mean is a type of mean that is calculated by multiplying the weight (or probability) associated with a particular event or outcome with its associated quantitative outcome and then summing all the products together (CFI Education, 2019). This is a measure of central tendency of a set of data. This will be used to determine the weighted means of Facebook as tool for spreading depression awareness. The formula is:

X = fx/n

Where:

x = mean

f = frequency of response

X = scale values

∑ = symbol of summation

n = number of respondents

Ethical Consideration

Before the researcher gave the survey questionnaire on the respondents, the researchers discussed the confidentiality and the survey was only for the research/study. The respondents were given and inform consent as a contract that they agree as being part of the research. They were also informed that all gathered information was treated with strict confidentiality, including their educational background and specially their answer to survey questionnaire. The name of the respondents was not used for this study.

This study came across some ethical issues, including the right to privacy and the right to answer the questions. The researchers ensured that all the ethical guidelines were followed. This was done under the permission of the school principal and the participants.

RESULTS AND DISCUSSION

This chapter presents the data gathered on Facebook Utilization for Spreading Depression Awareness: Impact on Help-Seeking Behavior of Grade 12 Students of Emilio Aguinaldo College-Cavite were analyzed and interpreted. This study also aims to determine the demographic profile of the respondents in terms of sex, frequency of Facebook usage and personality type of the grade 12 students in Emilio Aguinaldo College-Cavite. The current data collected by the researchers were illustrated, presented, interpreted and analyzed through Researchers' Made Questionnaire.

Demographic Profile of Participants

The tables presented and illustrated are the distribution of the demographic profile of the participants according to different categories such as sex, frequency of Facebook usage and personality type.

1. **Demographic profile of Grade 12 Students of Emilio Aguinaldo College Cavite in terms of:**

a. Sex

Table 1 Respondents Frequency Distribution in Terms of Sex

Sex	Frequency	%
Male	127	41.8
Female	177	58.2
Total	304	100.0

The table 1 shows the respondents' sex. There are 127 male, which equivalent to 41.8% and 177 female, which equivalent to 58.2%. This shows that the majority of the respondents are female.

According to Helen Flores of Philippine Star (2019), Filipino women use the internet more than men, according to a latest survey by

the Social media station (SWS). The poll, taken from March 28 to 31, showed a record high 50 percent of Filipino women who are internet users, up point from 49 percent recorded in December last year.

According to Clement (2019), Facebook is the most popular social network in the United States and as of November 2019, 53.7 percent of U.S. Facebook audiences were female, and 49.3 percent of users were male.

b. Frequency of Facebook Usage

Table 2 Respondents Frequency of Facebook Usage

Frequency	%
Less than an hour 13.2	40
1 to 2 hours 26.3	80
3 to 6 hours 39.8	121
7 hours above 20.7	63
Total **304**	**100.0**

Table 2 shows the frequency of Facebook usage. There are 40 students used Facebook less than an hour, which is equivalent to13.2%; 80 students used Facebook at least 1 to 2 hours, which is equivalent to 26.3%; 121 students used Facebook at least 3 to 6 hours; which is equivalent to 39.8%; while 63 students used Facebook at least 4 to 7 hours; which is equivalent to 20.7%. This shows that the majority of the respondents are used Facebook at least 3 to 6 hours a day, which is equivalent to 39.8%.

According to Jamie (2019), Facebook is the most popular social media sites among 65+ social networking sites. This is the largest social networking site in the world and one of the most widely used.

Asano (2017), states that the amount of people spend in social media is constantly increasing. Teens now spend up to 9 hours a day on social platforms, while 30% of all time spent online is now allocated to social media interaction. And the majority of the time is on mobile – 60 % of social media time spent is facilitated by a mobile device. In a summary of time spent in social media differs across platform.

In study of Jean Twenge (2017), discovered that students who spend more time using smartphones. And other electronic devices are less satisfied with their lives than students who frequently engage in face to face interaction. They found that teens spent five or more hours a day online were 71 percent more likely than an hour a day. Adolescence has experienced scrolling through Facebook for too long.

c. Type of Personality

Table 3 Respondents Type of Personality

Personality Type	Frequency	%
Introvert	156	51.3
Extrovert	148	48.7
Total	304	100.0

Table 3 shows the personality type of the respondents; it reveals that out of 304 respondents, there are 156 or 51.3% are introverts; 148 or 48.7% are extroverts. This shows that the majority of the respondents are introvert which is equivalent to 51.3%.

The personality of an individual has a great impact on the behavior of someone in the internet. A lot of literatures have proven the relationship between an individual's behavior and Facebook usage. Some personality traits associated with internet usage includes the need of closure and recognition, locus control, sensation seeking and risk taking (Joinson, 2007).

Moreover, individuals with low self-esteem are more likely to actively engage in social compensatory friending (Lee et al., 2012). Additionally, people who prefers Facebook over other social media sites see themselves as higher in sociability, extraversion and neuroticism but lower in need for closure (Hughes et al., 2012).

According to Dube (2015), everything about Facebook serves the emotional and psychological needs of introverts. It gives them a place to socialize and chat with people they like, without having to deal with the elements of in-person dialogues that make them uncomfortable. It allows them to say their piece, without being interrupted, scowled at, or patronized. Extroverts, on the other hand, often despise everything about Facebook. The facial cues, the backand-forth banter and the physical contact are all missing. In fact, it's often the extrovert who expounds upon the tragedy that social networks and smart phones are causing to society and interpersonal relationships.

Introverts love Facebook much more than extroverts is the fact that they use it more. According to Sheldon (2014) while extroverts may be more active on Facebook, Introverts actually use the social network for much longer periods of time than extroverts. In other words, even though the extroverts who are there tend to try to steal the limelight (just like they do in real life), Facebook is actually utilized much more by introverts. It is because Facebook appeals to an introverts desire to control who they interact with, and how that interaction takes place unlike in person environments where introverts often feel like they have no control over interactions. This need to control how communication takes place is what makes social networks in general more appealing to introverts.

According to Hamburger, Wainapel, and Fox (2002) due to their difficulties in face-to-face social interaction, introverts were able to be more open and reveal their true self on the Internet, whereas extroverts locate their real selves through traditional social interactions. Hamburger and Ben-Arzti (2000) demonstrated that introverts and extroverts use the Internet in different ways. On the Internet, introverted users can be more outgoing, confident, and sociable because the lack of non-verbal cues, control over personal information disclosed, and ability to process conversation in slower than real-time provides increased control over one's self-presentation, making social interaction less overwhelming.

According to Maldonado, Mora, Garcia, and Edipo (2001) they found that introverts sent computer-mediated messages with an extroverted tone and these messages contained more information than those sent by extroverted individuals. The Internet offers introverts the opportunity to express their Facebook true self in a more controlled environment where they can gain social recognition without feeling over stimulated by face-to-face interaction.

According to McCarthy (2010), found that using Facebook helped students who were more introverted. Facebook has the potential to build relationships because this medium allows students to integrate their thoughts, feelings, and their behaviors (Pempek, 2009). Furthermore adolescence, high levels of extroversion is correlated with increased feelings of happiness and lower levels of depressive symptoms (Cheng & Furnham, 2003). Extroversion scores have also been related to differences in internet use. When given the choice between Internet interaction and traditional social interaction, introvert prefer to express their true selves via the internet, while extroverts prefer the traditional social interaction as a means to share their inner thoughts (AmichaiHamburge, Wainapel, and Fox, 2002).

Accordingly, extroverts prefer the internet for goal oriented and instrumental task, as opposed to using the internet to feel like a member of community (Amiel & Sargent, 2014; Ross, 2009). These findings has been further supported when analyzing the Facebook user population, and it has been shown that online and offline popularity is associated with the ways in which users utilize Facebook features. Specifically, introverted users of Facebook are less popular in offline communities, and thus strive to make their online image exciting and interesting by oversharing personal information (Zywica & Danowski, 2008).

2. The perception of the respondents on Facebook utilization for spreading depression awareness.

Table 4 Frequency Distribution and Percentage of perception on Facebook Utilization for Spreading Depression Awareness

		SD	Mean	Verbal Interpretation
1.	Facebook as a source of information Where depression is being discussed.	.781	2.86	Agree
2.	Facebook as being used to spread positive memes/content about depression.	**.871**	**2.99**	**Agree**
3.	Facebook as a channel to know what People feel when they experience depression.	**.828**	**2.87**	**Agree**
4.	There are Facebook pages that discuss about depression.	**.786**	**3.22**	**Agree**
5.	Facebook can help me influence others to understand more about depression	**.838**	**2.97**	**Agree**
6.	Facebook hashtags being used by people who experience depression	**.918**	**2.64**	**Agree**
7.	Pages in Facebook can help me to spread or share knowledge and awareness about depression	**.779**	**3.27**	**Strongly agree**
8.	Facebook gives me a chance to be educated about depression	**.816**	**2.88**	**Agree**
10.	Wholesome/positive memes help me to have a better understanding about depression.	**.904**	**2.77**	**Agree**
11.	Facebook pages can help me become aware about the experience of having a depression.	**.786**	**2.91**	**Agree**
12.	Facebook can be a platform to understand and communicate depression	**.811**	**2.89**	**Agree**

13. Facebook hashtags gives me a chance to share emotions that they cannot share with their family and friends.	.881	2.77	Agree
14. Facebook can help me reach out to others about depression.	.775	2.87	Agree
15. Through Facebook, I am able to know how depression can damage the life of a person.	.801	3.03	Agree
16. Facebook can help me become aware on how to fight depression.	.909	2.77	Agree
17. Facebook can be a channel to spread awareness for depression.	.782	3.12	Agree
18. Facebook can be a medium to help those who are struggling in their live.	.832	2.90	Agree
19. People talk about depression on Facebook.	.812	2.84	Agree
20. Facebook is useful to the students to express their feelings when they are struggling in life.	.754	2.88	Agree
WEIGHTED MEAN		2.88	Agree

In this table 4 under Facebook Utilization for Spreading Depression Awareness, the result shows the highest weighted mean is 3.27 of item number 7: "Pages in Facebook can help me to spread or share knowledge and awareness about depression", which interprets as strongly agree, and the lowest weighted mean is 2.25 of item number 9: "Using depression hashtags, I am able to express my sad emotion", which interprets as disagree.

Based on the overall weighted mean of 2.88, the respondents find Facebook being utilized in spreading depression awareness whether the users themselves or certain organizations promote understanding among Facebook users about depression – how it feels and what are its

symptoms – through which anyone reading about the posts could, get positive idea about depression.

According to Hinde (2016), social media is providing a catalyst and conduit to people to break down perceptions around depressions and finally explain how they feel. Over the past few years, various campaigns spawned by both charities and the public have utilized pictures and selfies to help open discussions surrounding mental health. In October 2015, people took to Facebook the most popular social media site, instagram and twitter to share medications selfies, and positive memes in a bid to fight stigma surrounding mental health.   According to the study of The Connection between social media, Technology and Mental health by Kristina H. (2018), Facebook Statuses, Instagram and Twitter posts are continually posted, with people reaching out, or asking for advice. It has become its own network. You are either seeking help or giving help, openly and without conviction. Everyone is either "here to help" or "needing help", and it has become a plague in our culture. Seeking and receiving social support on Facebook research by Matthew A. Davis (2015), found out some evidence of social support on Facebook and that the language used in the root post of a conversation thread is predictive of overall response.

According to Pew Research Center (2016), 89% of adults (aged 1829) use social networking sites (SNS) for social interactions, information seeking and sharing, for entertainment, relaxation, expression of opinions, communication, business deals, and surveillance about others (Whiting & Wlliams, 2013). The most popular social networking site worldwide, based on the number of active accounts, is Facebook (Statista, 2016). People use Facebook because it satisfies the needs for belongingness, self-presentation and is advantageous in increasing connectivity and on-line learning (Pantic, 2014).

Weighted Mean

Range	
1.0 – 1.75	Strongly Disagree
1.76 – 2.50	Disagree
2.51 – 3.25	Agree
3.26 – 4.0	Strongly Agree

3. How do the respondents use Facebook to seek help about depression?

Table 5 Help-Seeking Behavior of the Respondents

	SD	Mean	Verbal Interpretation
1. I seek help by posting what I feel during down days	.951	2.14	Disagree
2. I post my angry thoughts on Facebook.	1.045	1.93	Disagree
3. I look for positive memes on Facebook when I feel sad.	.930	3.05	Agree
4. I go to group pages about depression to read stories shared by other people who experience it.	1.046	2.46	Disagree
5. I post what I feel to gain the attention of my friends and family.	4.260	2.19	Disagree
6. I use Facebook to ask help and release my upset	.997	2.08	Disagree
7. I enjoy Facebook more when I post or share my feelings.	1.069	2.51	Agree
8. I find Facebook a helpful tool to learn about depression.	.910	2.72	Agree
9. Reposting memes makes me feel comfortable and gives me relief.	1.036	2.77	Agree
10. I immediately seek help from users of Facebook before I seek help from my family.	.999	2.00	Disagree
11. I prefer to seek help from my friends online.	.996	2.39	Disagree

12. I use Facebook to see encouraging messages about depression.	.894	2.61	Agree
13. I feel good when Facebook promotes content about depression.	.936	2.59	Agree
14. I use Facebook as a source about to spread awareness about depression.	.884	2.78	Agree
15. I invest time to read positive memes in my Facebook.	.885	3.05	Agree
16. I always share my problems with my online friends.	.990	2.24	Disagree
17. I find Facebook useful in terms of seeking help about depression.	.926	2.51	Agree
18. I tag my friends in Facebook when I find content that are relatable to our experience.	.993	2.92	Agree
19. I get encouragement through sharing wholesome/ positive memes about depression.	.920	2.78	Agree
20. I consider Facebook as a platform where I can seek help.	.966	2.63	Agree
WEIGHTED MEAN		2.51	Agree

In this table 5 under the Help-Seeking Behavior of Respondents, the result shows the highest weighted mean is 3.05, of item number 3: "I look for positive memes on Facebook when I feel sad" and number 15: "I invest time to read positive memes in my Facebook", which interprets as agree, and the lowest weighted mean is item number 2: "I post my angry thoughts on Facebook", which interprets as disagree.

Based on the weighted mean of 2.51, the respondent's level of help seeking behavior through Facebook has agree verbal interpretation. The respondents seek help through Facebook post and commenting in positive memes. The result shows that the respondents used Facebook as a platform to seek help and they use Facebook as a source to spread awareness about depression . The respondents generally look for positive memes on Facebook when they feel sad.

According to Fox (2018), in his depressed teens turn to social media to cope, and according to the survey, there are many teens and young adults are using tech. They are using social media as a stand in for a therapist- not so much for feedback, but as a way to vent. Teenagers are setting up their own private social media chats, often sharing experiences with people they have never met face to face. According to survey, the internet and social media provide safe spaces for people to talk about depression and suicide. Even as they may steer them away from seeing medical professionals or therapists who are trained to help.

According to Eric Pedersen and Renee Ireland in their research entitled Help-Seeking on Facebook Versus More Traditional Sources of Help they stated that the social media platform Facebook is seen as a venue to seek help for emotional problems or suicidality among adolescents in the United States.

The Reachout.com published a journal discussing why young people seek help online, and according from it these platforms may be chosen as the location for the preferred help-seeking action because of some pretty appealing potential benefits. Posting on forums (such as the ReachOut Forums) can be anonymous, which lowers the risk of compromising the young person's public image. Alternatively, if it is not anonymous (i.e. a Facebook post) generally neither are the replies, so they can give extra weight to the point of view of the people they trust or who know them best.

According to Calvert (2015), many adolescents spend a greater amount of time receiving content than posting it because they read the content posted by friends about coping with depression to feel that they are not alone. Many teens also reported that they used the website to express themselves.

There are more research has been done in social media, and according to Gerlich (2014), most adolescents are using social media platforms to reach out and to see Positive word of mouth recommendations or reviews of these sites and it has a positive impact on those who are experiencing depression like them.

Weighted Mean
Range
1.0 – 1.75   Strongly Disagree
1.76 – 2.50
Disagree
2.51 – 3.25   Agree
3.26 – 4.0
Strongly Agree

Significant Relationship

4. Is there a significant relationship between sex of the respondents and Facebook utilization? Table 6 Significant Relationship between the demographic profile in terms of sex and perception on Facebook usage of the respondents

Chi-square	Df	Asymptotic Significance	Verbal Interpretation
49.687	42	.194	There is no significant relationship

Table 6 shows the significant relationship between sex and frequency of Facebook utilization, which can be proven by chi-square of 49.687. The result showed that sex and Facebook utilization had no significant relationship.

According to Morris and Erin (2013), men and women are subject to different normative expectations for social behavior and that this leads to gender differences in actual behavior. They said that women tend to communicate in more personally oriented ways, while men tend to communicate in more individually and task oriented ways. The result show, that in general, male and female use Facebook to communicate social support online.

5. Is there a significant relationship between the personality type of the respondents and the help-seeking behavior of the respondents?

Table 7 Significant Relationship between Personality Type and Frequency of Facebook Usage

Chi – square	Df	P value	Verbal Interpretation
36.566	42	0.708	There is no significant relationship

Table 7 shows the significant relationship between personality type and frequency of Facebook utilization, which can be proven by P value of 0.708. The result showed that personality type and Facebook utilization had no significant relationship.

This findings was not surprising, according to Levine (2014), a lot of research on personality types tends to focus on introverts or extroverts: opposite on the social scale, who either expend a lot of energy in social situations and need to isolate themselves to recover (introverts), or who gather energy from social situations and feel revived by company (extroverts). However, these personality types aren't absolute, and some research suggests that many of us may fall somewhere in between, switching between characteristics depending on the situation. But experts tell us Bustle that the idea of the "ambivert" – a person combines of both personality types. Even if you identify very much with traits that are absolutely introverted or extroverted, there's a lot of evidence that people tend to adjust their traits and behavior in reaction to their environment. However, existing somewhere between these two extremes may feel more comfortable for many of us.

According to Davidson (2017), the ambivert (personality type) and ambeversion (personality trait) were proposed as a healthy, normal. Middle-ground between extremes of introverts and extroverts, "he says. Basically, it's someone who can adjust or adapt their behavior toward introverted or extroverted depending on the environment or task at hand.

Significant relationship

6. Is there a significant relationship between the perception of the respondents on the role of Facebook in spreading depression awareness and help- seeking behavior of respondents?

Table 8 Significant Relationship between perception Facebook Utilization in spreading depression awareness and Help-Seeking Behavior of the Respondents

Pearson r	P value	Verbal Interpretation
.465	.000	There is a significant relationship

Table 8 shows the significant relationship between Facebook utilization and Help-seeking behavior, which can be proven by P value of 0.000 and 0.465 Pearson r. The result showed that Facebook utilization for spreading depression awareness and Help-seeking behavior has significant relationship.

The findings were surprising and can give as hope, according to Burleson & MacGeorge (2002), Emotional support or comforting, includes expressions of care, concerns or encouragement that are intended to alleviate the emotional distress of others. Individuals seeking emotional support are seeking comfort to assuage their emotional distress, which helps to fulfill emotional needs. Although publicly sharing emotions on Facebook is frowned upon, individuals need a space in which to express and fulfill their emotional needs . Facebook could be an advantageous medium through which to receive emotional support.

According to a Journal on Community Health some findings suggest that larger social networks predict higher levels of life satisfaction. Additionally, in the study in assessing Facebook user responses, positive emotions were found to be more prevalent than negative emotions, suggesting Facebook use may be associated with happiness. Some of the

researchers have identified the major benefits and advantages of social networking sites. For example, Facebook gives individuals a sense of freedom and identity, boosts up the confidence level of individuals and cheers them up during hard times (Nyagah, Stephen and Muema, 2015).

SUMMARY, CONCLUSION AND RECOMMENDATION

Summary

The study was attempted to find out the Facebook Utilization for Spreading Depression Awareness: Impact on Help-Seeking Behavior of Grade 12 students of Emilio Aguinaldo College-Cavite. Specifically, the study tried to find out the following:

1. What is the demographic profile of the respondents in terms of :

a. Sex

b. Frequency of Facebook Usage

c. Personality type (Introvert and Extrovert only)

2. What is the perception of the respondents on Facebook utilization for spreading depression awareness?

3. How do the respondents use Facebook to seek help about depression?

4. Is there a significant relationship between sex of respondents and Facebook usage?

5. Is there a significant relationship between the personality type of the respondents and the help-seeking behavior of the respondents?

6. Is there a significant relationship between the perception of the respondents on the role of Facebook in spreading depression awareness and help- seeking behavior of respondents?

The researchers gathered data by conducting a survey using researchers-made questionnaire to 304 respondents (Grade 12 SHS students) of Emilio Aguinaldo College-Cavite. The Frequency distribution, percentage, weighted mean, Pearson r were among the statistical formulas used in this

study. The frequency and percentage of distribution of the respondents were computed to describe the demographic profile according to sex, frequency of Facebook usage and personality type of the grade 12 students. The means and standard deviation of the variables were also computed to determine the level of Facebook utilization for spreading depression awareness and level of help-seeking behavior of the respondents. To determine the significant relationship between personality type and help-seeking behavior of the respondents and the significant relationship between the perception of the respondents on the role of Facebook in spreading depression awareness and help- seeking attitude of respondents.

SUMMARY AND FINDINGS

The following findings surfaced from the analysis and interpretation of data based on the data gathered from the Grade 12 students of Emilio Aguinaldo College-Cavite. The responses to the questions were arranged systematically.

1. The demographic profile of the respondents in terms of:

a. Sex. Majority of the grade 12 students is a female with a frequency of 177, which was 58.2 percent of the total number of the respondents.

b. Frequency of Facebook Usage. Most of the grade 12 students used Facebook for 3-6 hours per day with a frequency of 121, which was 39.8 percent of the total number of the respondents. And 7 hours and above has a frequency of 63, which was 20.7 percent of the total number of the respondents.

c. Personality Type. Majority of the grade 12 students are introvert with a frequency of 156, which was 51.3 percent of the total number of the respondents.

2. The perception of the respondents on Facebook utilization for spreading depression awareness.

Based on the overall weighted mean of 2.88, the respondents find Facebook being utilized in spreading depression awareness whether the users themselves or certain organizations promote understanding among Facebook users about depression, how it feels and what are its symptoms

through which anyone reading about the posts could get positive idea about depression.

3. How the respondents use Facebook to seek help about depression.

Based on the weighted mean of 2.51, the respondent's level of helpseeking behavior through Facebook has an adequate level. The respondents seek help through Facebook post and commenting in positive memes. The result shows that the respondents used Facebook as a platform to seek help and they use Facebook as a source to spread awareness about depression. The respondents generally look for positive memes on Facebook when they feel sad.

4. Significant relationship between the sex and Facebook usage of the respondents.

The data revealed if there is a significant relationship between the sex and Facebook usage of the respondents. According to the demographic profile in terms of sex of the respondents and Facebook utilization there is no significant relationship which is proven by chi-square of 49.687, degrees of freedom and asymptotic significance 0.194.

5. Significant relationship between the personality type of the respondents and the help-seeking behavior of the respondents.

The data revealed if there is a relationship between the personality type of the respondents and the help-seeking behavior of the respondents. According to the personality type of the respondents and Facebook utilization for spreading depression awareness there is no significant relationship, which was proven by the chi-square of 36.566, degrees of freedom of 42 and P value of 0.015609.

6. Significant relationship between the perception of the respondents on the role of Facebook in spreading depression awareness and help-seeking behavior of respondents.

The data revealed if there is a relationship between the perception of the respondents on the role of Facebook in spreading depression awareness and help- seeking attitude of respondents. According to the role of Facebook in spreading depression awareness and help- seeking attitude of respondents there is a significant relationship, which was proven by the pearson r of .467 and P value of 0.000.

CONCLUSIONS

After the researchers did all the procedures, various data and results are gathered and analyzed In order to attain the accurate conclusion of this study. Thus, the researchers had concluded that;

1. Demographic profile

a. Sex. Majority of the Facebook users are female. Female use Facebook more to share some selfies, experiences, moods and positive memes. Women tend to share the post of other while men tend to focus on current events, politics, news and communicating with a small core of close friends.

b. Frequency of Facebook usage. Adolescence spend up to 3- 6 hours and 7 hours and above in a day on Facebook site. Adolescents tend to share their experiences, own thoughts, problems and happiness. The adolescents find facebook as a source of freedom to talk to people they don't know personally.

c. Personality type. The personality of an individual especially adolescents who where young and carefree have a great impact of the behavior of someone in the internet. There are many literatures proven the relationship between an individual's behavior and Facebook usage. Facebook gives to introvert a place to socialize and chat with people they like, without having to deal with the elements of in person dialogues that make them uncomfortable. It allows them to say their piece, without being interrupted, scowled at, or patronized.

2. Adolescents took to Facebook to seek help, share moods and experience. Through Facebook adolescents can seek help and can provide help to other people they don't know personally. It is easy to them to share their emotions to other people because it does not require a face to face

3. Adolescents seek help through Facebook post and commenting in positive memes. They used Facebook as a platform to seek help and as a source to spread awareness about depression. Adolescents generally look for positive memes on Facebook when they feel sad.

4. The demographic profile in terms of sex has no significant relationship between Facebook utilization of the respondents. The women tend to

communicate in more personally interpersonally oriented ways, while men tend to communicate in more individually and task oriented ways. In general, male and female use Facebook to communicate social support online. All Facebook users tend to seek help on Facebook no matter what their sex is.

5. Personality type has no significant relationship with help seeking behavior of the respondents. Personality type does not matter. There is a personality type called ambivert which is a combination of introvert and extrovert. People tend to adjust their traits and behavior in reaction to their environment. The ambivert were proposed as a healthy, normal.

6. There is a significant relationship between the perception of the respondents on role of Facebook in spreading depression awareness and help-seeking behavior of respondents. Facebook utilization can be a channel or can be a way for spreading depression awareness and it has an impact to help-seeking behavior of the participants. Facebook utilization has a positive effect to the Facebook users who was able to read some positive memes, campaign about depression and able to meet people with depression. Adolescents used Facebook to gather information on what is within the people who experience depression. The people who experience depression can help each other on how to fight their problems. Facebook is not all about negative effects and it can help those who are suffering from depression on using it right and in useful ways. Adolescence try to look for the positive or bright side of social media like Facebook because we cannot stop people to avoid using it. The researchers believe that human being has a powerful mind and because of that we can deal with all struggles in life. Therefore, the study concludes that Facebook can be both beneficial and detrimental to people specially to the youth. It has a great impact on their psychological well-being. Furthermore, Facebook utilization in spreading depression awareness appears stronger on the introvert side which is good sign to help them to be more positive in their life. People of different ages can be more aware of the behavior of people through their act not just on Facebook but in all social media sites. Using Facebook can be somewhat detrimental due to people who linked negative issues and people who tries to ruin someone's life. On the other hand, Facebook is a great way where people can have social supports that can lift or cheer them up during their bad days. Moreover, all of the results can be beneficial at the present times where people can obtain a lot of information in socializing and boosting self-esteem. Then, people

must also reinforce offline social relationships for intimacy and personal social ties like attending social gatherings. But what is more important is that all people must be sensitive and careful enough in using Facebook or any other social media sites and be responsible enough for their acts.

RECOMMENDATIONS

In view of the above findings, the following recommendations were drawn.

1. For the Participants. The researchers recommended using Facebook in a proper way which it will be beneficial to other people as a way to seek help and give help also. Facebook users can be a member of a mental health campaign for them to be one of the advocates of mental health. Facebook site is the most used social media site in the world, through this we can help each other for giving social support and encouragement to live life to the fullest and appreciate things we have. We should care about what we have seen in our timeline because all we have seen has a meaning, maybe your friends is happy, sad, struggling or maybe in pain and suffering from any kind of mental health problem. Using Facebook we can easily get connected to each other so we can easily give sympathy and empathy to each other. Through this study, it can give them an insights on what Facebook can do to our lives specially mental health is a serious issue nowadays.

2. For the School. The researchers recommended giving attention on those factors that can cause depression on the students. They can conduct a program about how to use Facebook to give empathy and sympathy to other people. They can introduce Facebook as a good example of social media site where the students can seek help and can reduce the population of people who experience depression.

3. For the Parents. The researchers recommended to not forgetting giving your children a social support they need. They can get a social support to other people through Facebook but the social support from the parents is the most powerful among all. As a parent, you cannot stop your children to use social media but they can teach their children to use social media in a right manner.

4. For the Teachers. It is recommended that they may use social media to monitor and support their students. As a teacher, you are the one who

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can observe the behavior of your students. As a teacher you should be aware on what is happening to your students. Through Facebook pages and Facebook group chat, the teachers can guide their students to do things right and teach them to enjoy life and they can give advices. Give empathy to your students because that what they need.

5. For the Guidance Counselor. The researchers recommended facilitating a program to discuss on how to use Facebook site correctly. By doing their job they can conduct a seminar on how to use Facebook in a useful ways and they can teach the students to become sensitive on any post of their Facebook friends. As a guidance counselor, they can promote some mental health pages in Facebook and mental health campaign group in Facebook to the students and by doing this they can get more advocates to fight against depression and as well as to be aware of other people. Everything can be seen in Facebook that is why we will know if somebody needs our help. As a guidance counselor, they should introduce the guidance office as a helping room where they can easily getting in touch with the guidance counselor and the guidance counselor should have an open arm to the students. We all know that most of the people had wrong interpretation about what guidance office really is that is why we should introduce the guidance counselor should do an act where the students will not hesitate to go to guidance to seek help from the guidance counselor.

6. For the Facebook Admins. The researchers recommended adding or allowing restriction of negative thoughts in Facebook. And easy access to the link of depression awareness. The researchers also recommended to continuously inviting people to raise or spread awareness about depression. The researchers also recommended to the Facebook admin having a connection to the Department of Health for the better dissemination of knowledge and thoughts about depression. The big population can hear the campaign the better the result to lessen the population of people with depression.

7. For the Future Researchers. We the researchers believe the positive side of Facebook site to fight against depression. The researchers recommended to the future researcher to conduct this study involving more participants in a school and participants outside the school and add more social media sites. Further studies along the following may be conducted and the researchers were open and willing to share to the findings of this study to you. It will be better if they will involve participants

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of different groups so they can have a lot information because people with different ages also have different personality. Regarding on theory they can use to their study, they can use the two theories listed above but they can also add more like the health behavioral social cognitive models or social learning theories that are widely concern with health education. It also targets the causes of changes in behavior like social media competency. The researchers also recommend to use also a qualitative method of research so that future researchers can have a deep understanding about the study. With this, they can have different analysis not only on Facebook utilization for spreading depression awareness but also on the effect of other social media sites to people.

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Parenting Style and Social Interaction Anxiety among Grade 6 Pupils at BES Elementary School in Silang, Cavite

April Eunice O. Aguinaldo and Frederick A. Andal

School of Education

Abstract. Parents are the most important persons in a child's life. Variety of parenting styles is used depending on culture and societal needs. Social anxiety on the other hand, leads to feelings of inadequacy, inferiority, self-consciousness and embarrassment, a common experience of pupils in elementary grade. Thus, this study determined the relationship between parenting style and social interaction anxiety of Grade 6 pupils at BES Elementary School in Silang, Cavite. The study is a quantitative descriptive research design conducted to sixty (60) pupil participants from BES Elementary School. Adapted survey questionnaire was used to analyze the parenting style and social interaction anxiety. Pearson correlation was used to assess the relationship between parenting styles and pupils' social interaction anxiety. One-way ANOVA was used to determine the significant difference between the parents' parenting style. Results revealed that authoritarian parenting style is moderately correlated with the pupils' social interaction anxiety ($r = 0.409$; $p = 0.002$). The very weak relationship was observed between authoritative and permissive parenting style and pupils' social interaction anxiety. Further, there was no significant difference ($p > 0.05$) observed among the parenting styles of the parents of the grade 6 pupils. The results indicated that authoritarian parenting style can lead children to become social anxiety. This suggests the possibility of extending the study of the potential of parenting style as predictor of different mental disorders among children and adolescents.

INTRODUCTION

Parents are important persons in a child's life and they greatly influence holistic development of their children. In this world parents behave in different way of shaping and molding their children. Hence, parents show specific attitudes and behaviors in gearing up a child. Lytton and Romme (1991) as refered to in Yousaf [1], the most well-known partaker in child rearing is the natural guardians of the kid, in spite of the fact that others might be a more established kin, a grandparent, a legitimate gatekeeper, auntie , uncle or other relative or a family companion. Andal, et.al [2] worries about the connections between child rearing styles and kid's advancement.

Besides, nervousness is a body's normal reaction to stretch, it is an inclination of dread or fear of something that is the thing that to come. It can't to feel restless about moving to another spot, or stepping through the exam. Inam, Mahjabeen and Abiodullah [3] noted that feeling anxiety and nervous while speaking or presenting in public is common to many people. However, the persistent occurrences of irrational fear of situations impede, everyday activities and making it hard to and keep friends, thus social anxiety becomes social anxiety disorder.

On the other hand, Inam et al. [3] describes social anxiety disorder as an overwhelming anxiety and excessive self-consciousness in everyday social situation. It was expressed as the fear of social or performance situations, that can result in avoiding any social situations, social withdrawal and remoteness. Parenting style has a significant relation with social anxiety [1]. Inam et al.,[3] agree that the parenting style of the parents used to their children and the environment they provide has an influence in the development of social anxiety. Parents who had no experience on socialization with their children may isolate them and these are more likely the children with special phobias.

In another investigation by Kim and Kwack [4] guarantee that child rearing is for the most part influenced by the parental condition like parental grown-up connection style, child rearing style, parental psychological well-being, and child rearing pressure. In this manner, they led child rearing training exercises for typical populaces to give guardians with appropriate instruction on child rearing and offer chances to examine child rearing issues together with the guardians. This is to help adapt to child rearing pressure and to build up the aptitudes of

critical thinking. In their study, they successfully examined the effects of parenting education program on parenting stress, parenting style, adult attachment, and psychopathology. This is in relation to this study as it discussed one part of their study that is on parenting style, but Kim and Sook [4] failed to discuss the social interaction anxiety which is present in this study. This is the reason why the researchers were inspired to find out primarily the relationship between parenting style of parents and social interaction anxiety of Grade 6 Pupils at BES Elementary School Silang, Cavite.

Finally, this study seeks to find out the parenting style of parents among Grade 6 pupils at BES; to learn the type of social interaction anxiety among Grade 6 pupils at BES; to learn if there is a significant relationship between Parenting style and Social interaction Anxiety among Grade 6 pupils at BES Elementary School Silang, Cavite; and if there is a significant difference on the parenting style of parents among Grade 6 pupils of BES Elementary School Silang, Cavite?

Theoretical Framework

There are four theoretical models which are classified based on the causes of social anxiety [5] ;the skill deficit model assumes that it occurs due to inappropriate social skills that result in awkward social encounters and avoid situations. Cognitive self-evaluated model states that a negative self-perception can lead to social Interaction anxiety. The classical conditioning approach assumes that creating an adverse situation can lead to social interaction anxiety. Lastly personality approach states that social interaction anxiety occurs due to differences in the emotional, cognitive, and behavioral aspects of personality.

Significance of the Study

The result of the study benefited the parents because they try to find out the various parenting styles that affect the mental health of their children. Also, it helps parents understand the important role they must play in the mental health of their children in order to ensure success. Furthermore, it also helps them to know which parenting style will be appropriate to use. For the students, this study is very beneficial because they gain knowledge about the social anxiety and will benefit about the result of this study. For E**lementary Teachers, it helps them understand** the situation of the each student who are experiencing social interaction anxiety. It is significant to teachers who are responsible for imparting knowledge on handling grade 6 pupil with social anxiety. Finally, this research is helpful for the future researchers because they could use as reference for their studies

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Scope and limitation

The study dealt primarily on the parenting style of parents and social interaction anxiety of Grade 6 pupils at BES Elementary School Silang, Cavite. The relationship between the parenting styles and the level of social interaction anxiety were determined and the social interaction of the grade 6 pupils was assessed. It also focused on determining the social anxiety disorder of the study, however, results was presented if deemed necessary. The parents of the pupils were not included as participants of the study. Other grade levels, such as grade 1-5 were not part of the study.

METHODOLOGY

Research Design

This study used a descriptive research design that dealt primarily with the social interaction anxiety of Grade 6 pupil at BES Elementary School in Silang, Cavite.

Research Locale

The study was conducted at BES Elementary School in Barangay Balite 2nd Silang Cavite. It is one of the remote barangays in Silang, far from the center of commercial establishments. Grade 6 pupils in the Elementary school were reportedly aloof with other people and timid on socializing with others. For this, the researcher chose the BES Elementary School to be the locale of the study. BES Elementary School seems to be the perfect source of information needed for this study since it deals with children social interaction anxiety.

Research Participants

Sixty (60) Elementary Grade 6 pupils at Balite 2nd Silang Cavite were selected as participants of this study. This 60 grade 6 pupils were chosen due to different characteristics in terms of a certain traits on attributes, and attitudes hence they had shared a particular experience. This differences was the primary source of data in this particular study.

Sampling Technique

The study used a total population sampling, a type of purposive sampling technique that had been examined the entire population. Thus, total population sampling was appropriate for the population size of the elementary Grade 6 pupils at BES was relatively small. In additional, the

Characteristics shared by the population was considered to be uncommon because this served to be explained why the population is very small.

Data Gathering Procedure

The researchers used the survey questionnaire which was adapted from Dr. John R. Buri's Parental Authority Questionnaire and Social Interaction Anxiety Scale (SIAS) adapted from CO-OCCURING DISORDERS PROGRAM: Screening and Assessment were given to the grade 6 pupils. The researcher assisted the grade 6 pupils in answering the survey questionnaire and making sure the all the question was answered, otherwise, the questions with an incomplete information were not considered as part of the study and were considered as null and void. The questionnaire was returned and collected by the researcher that was consolidated to organize the data which was given to a statistician to employ the statistics which was tabulated, interpreted and discussed.

Research Instrument

The researcher used survey-questionnaire adapted from Parental Authority Questionnaire (PAQ) and Social Interaction Anxiety Scale (SIAS) the survey questionnaire were validated and reliability test was conducted.

The survey-questionnaire are composed of two parts:

Part I included the Parental Authority Questionnaire, composed of 30 item questions geared to identify the parenting style use at home, that included a four-point scale. Part II included Social Interaction Anxiety Scale, a 10 item Likert-scale designed to assess the way the children feel when interacting with strangers or a large group of people.

Data Analysis

The researcher employed the following statistical treatments:

Weighted Mean is a sort of normal. Every datum point contributing similarly to the last mean, a few information focuses contribute more "weight" than others. This answers question number 1.

Pearson Correlation is the test insights that gauges the factual relationship or relationship between two factors. This enables the analyst to answer the relationship on the inquiry number 2. The researcher answer the relationship on the question number 2.

One-way ANOVA is an analysis of variants a test of two or more groups if there is significant difference between two characteristics, which helps answer the question number 3.

Post-hoc Test (Tukey Test) is to discover the outcome whether there is a critical connection between the Parenting style and Grade 6 student.

RESULTS AND DISCUSSION

Table 1
The parenting style of parents among Grade 6 pupils at BES Elementary School
Silang, Cavite

Parenting Style	Strongly Agree		Agree		Disagree		Strongly Disagree	
	F	%	f	%	F	%	F	%
Permissive	0	0	38	67.9	18	32.1	0	0
Authoritarian	2	3.6	34	60.7	20	35.7	0	0
Authoritative	2	3.6	39	69.6	15	26.8	0	0

The table above depicted that 69.6% (n=58; f=39) majority of the respondents agreed that their parents are authoritative.

Table 2
The social interaction anxiety among grade 6 Pupils at BES Elementary School Silang, Cavite

Parenting style and Social Interaction Anxiety		r-value	relationship	p-value	Significance
Social Interaction	Permissive	0.075	No relationship	0.583	No significance
	Authoritarian	0.409**	Moderately	0.002	significance
	Authoritative	0.110	No relationship	0.419	No significance

Interpretation	Frequency	Percent
Extremely true of me	1	1.8
Moderately true of me	30	53.6
Very true of me	23	41.1
Slightly true of me	2	3.6
Total	56	100

Social Interaction Anxiety   2.54   Very true of Me

Based on the result 30 or 53.6% of the Grade 6 pupils were having social interaction anxiety which indicates to be moderately true among the Grade 6 pupils of the elementary school.

Table 3
The relationship between parenting style and social interaction anxiety among Grade 6 pupils at BES Elementary School Silang, Cavite
The result shows that the r-value of the authoritarian and social interaction anxiety was 0.409** which explained that there were relationship between the   two and their p-value was 0.002 which also showed that they were significant.

Table 4
The significant difference on the parenting style of parents among Grade 6 pupils of BES, Silang Cavite.

Parenting Style	Mean	SD	P-value	Significance
Permissive	2.698	3.57003		
Authoritarian	2.696	4.35249	0.4902	Not significant
Authoritative	2.777	4.20818		

The three parenting styles shows no significant difference (p>0.05) with each other as shown by the closeness of the mean scores. This signified that the three parenting styles were exhibited among the parents of the Grade 6 pupils of the BES Elementary School Silang, Cavite.

Parenting Style of Parents among Grade 6 pupils

The three parenting styles such as permissive, authoritarian and authoritative were found to be distributed among the parents of the Grade 6 pupils in the BES Elementary School. Deci & Ryan (1985) as

cited by Dobre et al., [6] , noted that parenting styles influences a child's development, that the attributes and internal resources were determined by the parents, but also the ability of self-regulation and self-evaluation. Dobre, etal. [6] reported that parenting styles were associated with optimism, which translate into a high level of influence between the child's acceptance of the parenting style and his level of happiness and acceptance. The current study revealed that authoritative parenting style marks higher as compared to permissive and authoritarian but showed no significant difference between the other. Several studies revealed that children with an authoritative parents are high in academic capability, and with a low level of problem. Authoritative parents tend to have a child with self-control, self-reliant, willing to explore. Andal et al., [2] also noted that children with authoritative parenting style was less delinquent as compared to those children with permissive and authoritarian parenting style.

Social Interaction Anxiety among Grade 6 Pupil

Grade 6 pupils at BES Elementary School appeared to have high level of Social Interaction anxiety. A child with low self-confidence, aggressive and less social interaction where a child who is experiencing social phobia or social interaction anxiety. Children who are more likely to miss school and experience difficulties that let them feel unfit for a successful life has a high level of social anxiety. Developing social anxiety and fear of socializing with other people had a negative effect on a child academic performance. As Jafari et.al. [7] claims that rejection from the parents increased of having anxiety in adolescent.

Relationship between Parenting Styles and Social Interaction Anxiety

It clearly showed that there is a moderate relationship between parenting style (authoritarian) and social interaction anxiety among grade 6 pupil. Parents with any emotional involvement with their children leads a child to have lack of attention, violating rules and threaten others. It was discovered that youngsters will in general have social tension as a result of tyrant child rearing style that drives kids to get defiant and embrace hazardous conduct because of more force extracted by their folks Samiullah Sarwar [8].

Exaggerated control of parents like invasion of privacy, critics and penalties over their child, were more likely to have low confidence level in socializing with other people. Further studies indicated that the anxiety is more powerful when over-control was associated with negativity in parenting style.

Authoritative parenting was generally connected with good outcome (adjustment and guilt), it produce a good child outcome, caused by a consistent discipline to their children.

Nefise and Sop [9] in their comparable examination, it demonstrates that youngsters' on edge conduct influence their consideration drive control aptitudes in a negative manner while kids' consideration motivation abilities influence their school status in a positive manner. Discoveries have been sent to the school concerned and these have been talked about in the extent of school preparation dependent on the outcomes.

Conclusion

Parenting styles create different social environment on the lives of children. The parent's parenting style of the Grade 6 pupils at the BES Elementary School are exhibited among the parents of the Grade 6 pupils, that is, permissive, authoritative and authoritarian parenting style. Most of the Grade 6 pupils are experiencing a high level of social interaction anxiety. Among the three parenting styles, authoritarian parenting style is significantly correlated with the social interaction anxiety. The three parenting styles have found to have no significant difference with each other. In a nutshell, parents are important personality and has great influence in child life, therefore, this study tends to enumerate some recommendations, such as: (1) Parents should also be evaluated to determine directly to assess their parenting style. (2) Parent should adapt different parenting style on their children to prevent high level of social interaction anxiety. (3) Future researcher should use bigger population and private school for a future study. (4) Overall, future research can attempt to expand this area of study by investigating such cognitions or goals of parenting more directly.

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Disaster Risk Reduction Management Implementation for Persons with Disabilities in the Philippines: A Literature Review

Sophyia Q. Taer, Dominique Khael Ligeralde, Ninalene Joy Urbe, Loraine Kaye R. Almonte, Ms. Zharmine Agravante, PTRP and Ms. Glenda V. Sanggalang, MHPEd, PTRP

School of Physical Therapy and Respiratory Therapy

Abstract. This study aims to enumerate and describe the established plans and programs concerning disaster-risk-reduction management in the Philippines focusing primarily on (PWDs). The researchers used descriptive literature review which included key concepts on PWDs and disaster risk management. To find sources of information on the status of the Philippines as to implementation, keywords such as *PWDs in the Philippines, Disaster Risk Reduction and Risk Disaster Management* were used. Initially, 6,697 articles that have a relation with risk disaster management in various forms whether man-made or natural disaster were included initially in this study. However, the researchers further refined the search using the *PRISMA-based Article Selection Process* to assess the found articles. Articles with no accessible full-text versions were excluded as well as articles which have met the inclusion criteria. From there, only five significant articles ((1) SageJournal and ScienceDirect article, (1) PubMed article, and (3) Herdin articles) were retained in this study. The researchers have found five established programs and plans that cater the needs of PWDs- Albarracin et al. (2013), Aison et al. (2018), Danglipen et al. (2017), Carcellar et al. (2011), and Marella et al. (2016). The rehabilitation team, specifically physical therapists, play vital roles as trainers, educators and collaborators during the response phase of disaster management and as developers and facilitators during the recovery phase (Aison et al., 2018). The articles primarily conveyed that a modificatory and compensatory approach in established DRR programs, with the help from rehabilitation teams, markedly affects the skills of PWDs in terms of preparing and evacuating (Danglipen et al., 2017; Albarracin et al., 2013; and Aison et al.,2018).

INTRODUCTION

Background of the Study

"Persons With Disabilities in the Philippines still experienced unfairness since laws and policies crafted for them were not effectively enforced." - a statement from the unalienable rights report of the U.S State Department (U.S. Department of State, 2018).

PWDs were considered tragic, feeble-minded, and pitiful individuals in the 1800s as per Vaughn & Jacqueline (2003) stated. They were treated as ridiculed objects and without equality. However, the disability advocacy and human rights movement was started in the 1960s which demanded equal treatment and equal opportunity for PWDs. In the 1970s, Republic Act 1973 which protects the rights of PWDs was established.

Rodriguez (2015) reported that Carmen Reyes-Zubiaga, the Executive Director of the National Council on Disability Affairs (NCDA), stated "Few rescuers acknowledge they do not have an actual knowledge how to evacuate and to respond to persons with disabilities' special needs", directing to the typhoons Sendong and Yolanda. The renowned director also affirmed that about 80% of PWDs did not obtain "apt actions and treatment from appointed government sectors regarding evacuation".

The researchers had been moved by these issues to conduct a study regarding PWDs with the goal of enumerating and describing disability-inclusive disaster risk reduction programs. DRR programs were highlighted in this study since the Philippines, the chosen locale of this study, has the highest risks index, ranking third worldwide (World Risk Report, 2018). This is chiefly caused by the geographical context that considerably influences hazards such as typhoons, storms, cyclones, earthquakes and sea-level rise. Also, Persons with Disabilities (PWDs) substantially compromise the total population of the Philippines with 193,000 in Region IV-A as per the census of the Philippine Statistics Authority (PSA, 2020).

Furthermore, other countries who experience the pandemic also suffer from incidents concerning Persons with Disabilities. According to France-Presse (2020), a 17-year-old chinese boy with a condition called cerebral palsy who lived in Hubei Province of China, was abandoned since his father was captured for quarantine. The boy was confined to a

wheelchair for an unknown amount of time. He was not able to speak, walk nor eat by himself due to the impairments caused by his condition. Because of the given circumstances, unfortunately, the young boy eventually starved to death. And this incident was brought by the negligence of the government officials in the said country.

Disaster risks are not natural. According to Prevention Web (2015), the prevention of losses and alleviation of the disaster's impacts could be achieved by minimizing and controlling conditions of danger and susceptibility. The lack of education and capability to cope with such events exacerbates the exposure of developing nations to the risks of disasters. It is a must for the government and local government units to generate a disaster risk reduction management plan that is tailor fitted to different areas depending on the need. As a matter of fact, there are two physical therapy roles in immediate disaster response- first is the patient care that includes helping with the triage, wound care, first aid as well as the musculoskeletal treatment; second is the organization of a physiotherapy service in the immediate response.

The found journals and news articles provided information where the aforementioned incidents highlighted the issues PWDs during disaster-risk-reduction implementation were keenly observed. Due to this observation, the researchers were inspired to conduct this study in hope to provide an education that would enlighten these issues concerning PWDs. Thus, this study intended to seek information regarding the risk disaster reduction management plans and implementation in the Philippines particularly for the PWDs since the significant solution in lessening death, casualties, and harm from disasters is extensive and comprehensive public education and preparation as per the word of the National Research Council (1991). Additionally, PWDs have the same rights as other people have, as stated in the Magna Carta for PWDs. PWDs are one of the significant parts of the society. In relation to this, the nation shall give full assistance to them in order to improve the involvement of the PWDs into the society.

Objectives of the Study

This study aims to enumerate and describe if there are established programs and plans concerning disaster risk reduction management in the Philippines that focus primarily on PWDs.

Statement of the Problem

What are the disaster risk reduction management and programs that have been implemented in the Philippines specifically to cater the needs of Persons with Disabilities?

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Significance of the Study

Persons with Disabilities (PWDs). This study will provide education to PWDs as to their inclusion in implementing disaster risk reduction management. Also, this study will enlighten the PWDs about their rights and entitlement.

Physical Therapists. Further knowledge gained in the education provided by this study will help the physical therapists to be enlightened of the situation of their common patients. This study will also inspire Physical Therapists in making community-based programs that will train the PWDs of the basic survival routine if there is any disaster.

Government. This study may serve as a basis in evaluating the inclusion of PWDs in disaster risk reduction plans. This study may give education to the government which could improve their evaluation of the effectiveness of the enforced protocols and programs about disaster risk reduction.

Public. The output of the study may enlighten the public by providing education whether persons with disabilities truly have an issue in receiving disaster risk reduction management.

Prospective Researchers. Lastly, this study will also be a contribution to prospective researchers since it can be used as a reference in making studies in the future that would be related to disaster risk reduction plans and PWDs.

Scope and Limitation

Describing and enumerating the disaster risk reduction programs that could cater the needs of the PWDs specifically, was the only focus of this study. This study was restricted to disaster risk reduction programs of the Philippines. This study aims solely to describe and enumerate the DRR programs, not intending to evaluate the effectiveness of DRR plans nor neither facilitate one. Also, only five articles from four various search engines which were assessed based on established inclusion criteria were included in this study. The articles that have been included were written using English language and were published in a recent 10-year period. Articles that have no access to full-text versions and that were based internationally with a publication date of greater than 10 years, were being excluded in this study.

Conceptual Framework

Input	Process	Output
- Local articles - Journals - Theses - Dissertations	- PRISMA-based article selection process - Golden Thread	- Disaster Risk Reduction Implementation for PWDs in the Philippine: A Literature Review
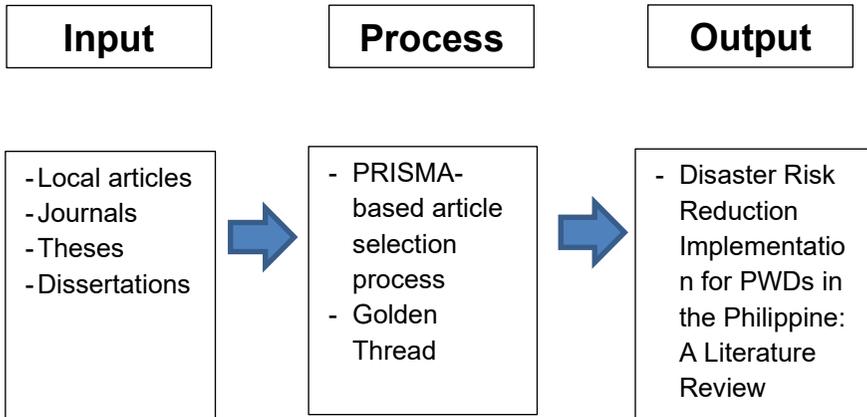
Figure 1.0 The Conceptual Framework

This figure indicates that local articles, journals, theses and dissertations together with the PRISMA-based article selection process and golden thread will contribute to complete the output of this study.

Review of Related Literature

This subchapter presents the brief review of literature and studies obtained from diverse articles, theses, news reports, journals, and laws which have a relevance to this study. The excerpts from articles, reports and laws that discuss about Philippines's disaster risk index, PWDs issues and PWDs inclusion in DRR programs with a range from local to foreign literature were included in this subchapter.

PHIVOLCS (2018) reported that during the Mayon Volcano eruption, 29 barangays in the Municipalities of Guinobatan and Camalig were covered with ash falls. Lava flow, ash fall events and short pyroclastic flows followed. This caution caused the evacuation of about 5,000 families from three municipalities and two other cities, with a total of about 21,000 people.

Aison et al. (2017) stated that Republic Act No. 10121, a national disaster risk reduction, response and management framework was enacted in 2009. On the other hand, Kumar et al. (2013) discussed the disaster management cycle. They have affirmed that planning and preparedness are the most essential stages of disaster management.

Kumar et al. (2013) also proposed a framework where it was also clear that there are three phases of disaster management cycle, namely, Pre-disaster Phase, During-disaster Phase, and Post-disaster Phase. These three-phase cycles were specified further into details; in Pre-disaster Phase, mitigation and preparedness are the subfactors; in During-disaster Phase, the response is the only subfactor; and in Post-disaster Phase, recovery and rebuild are the subfactors.

Luardo (2017) reported that a national conference regarding disability-inclusive disaster risk reduction management occurred at the hotel with the theme of "Inclusion starts with I". The three-day conference was initiated by the different PWD groups and local government units with approximately 150 participants from all over the Philippines. The national conference discussed and tackled issues about disaster risk reduction management with an inclusion of PWDs.

Guernsey et al. (2017) highlighted that resisting disability-based discrimination can encourage PWDs and their families to create strategies may improve their flexibility to disasters. Access to rehabilitation services, assistive devices, and information suited to their needs can promote increased self-sufficiency which enables them to be involved in DRR management. An awareness about comprehensively understanding and considering risks regarding PWDs will assist the community in ensuring a more extensive perception of the dilemma of PWDs which can support the evolution of DRR plans.

Kamil (2016) conducted a case study in the Philippines to assess DRR programs after typhoon Yolanda. As stated in his report, NORFIL, a member of Handicap International's Philippine Office, together with other organizations includes disability-inclusive disaster risk reduction measures in its building activities which involved a training on disability-inclusive DRR management. NORFIL and other organizations also contributed to the existing Basic Instructional Guide on DRRM published by the Philippine government, making it more inclusive and disability-friendly by providing supplemental journals that discuss PWDs and elderly in all phases of DRR management.

Cabico (2020) stated that as the Proclamation No. 929 was issued to impose an Enhanced Community Quarantine where the public transportation had been prohibited and social distancing in which the persons should stay at least 6 meters away from each other. Maria (not her real name) has an 11-year-old cerebral palsy child and a youngest who has Attention Deficit/ Hyperactivity Disorder (ADHD). Both of her children go through therapy occasionally. But without the use of public transportation, her children's access to physical and occupational therapists had also been cut off.

Calimon et al. (2020) affirmed that as the Code Red Sublevel 2 was raised due to the novel coronavirus (COVID-19), more serious social distancing measures had also been made. With these social distancing measures, every PWDs faces a lot of dilemmas. Even the UN Special Rapporteur on the rights of PWDs has voiced out concerning the PWDs in the middle pandemic where it was highlighted that little has been done to preserve the rights of the PWDs community. The human rights expert also added, "People with disabilities feel they need to have different protocols since social distancing and self-quarantine may not be feasible for those who depend on the assistance of others as to eating, dressing and bathing."

Imperial et al. (2017) reported that in 2013, Typhoon Ondoy wrecked the drainages of cities and caused a flood that was about 23 meters as recorded in the city of Marikina. This city is renowned for its efficient early warning system since they always produce ear-splitting warning sirens to give notice to the public. However, despite the city's efficiency, the warning systems they have could only be heard which are of no help to those who have an impairment in hearing, which had been a hindrance to a 22-year-old girl, Rodelyn Gacute. As a person with hearing impairment, Rodelyn found it hard to be accommodated by the city's warning sirens. She had to depend solely on her mother, Zoraida Gacute, who in return relayed the signals to her about impending floods.

Gaston (2020) reported that a female PWD was rescued by members of Wilderness Search and Rescue (WISAR) since she was left behind by her relatives when the Taal eruption happened. Rubiano (1992) affirmed through Magna Carta for PWDs that PWDs should be treated as equally as the other people in order for them to take proper place in society. All human beings in the society should be catered in implementing disaster risk reduction plans. The State shall also give full assistance in order to improve the total well-being of PWDs and their involvement into the society.

In support with the Magna Carta for PWDs, Americans with Disabilities Act of 1990 was also enacted in order "to issue a firm and comprehensive national policy for the evaluation of discrimination against individuals with impairments. This act forbids a "public entity" from discriminating against an individual with a disability towards access to employment, programs or services. The safety of PWDs has been an essential and crucial standard for compliance with the ADA.

The aforementioned citations are just some evidence that Philippine is indeed a disaster-prone country which implies that it is in dire need of efficient and extensive disaster risk reduction plans. However, even if disaster risk reduction plans were being implemented, it should cater to all individuals.

Individuals with impairments are an essential part of the Philippine society. In support of this, American with Disabilities Act of 1990 prohibits discrimination against oneself based on any kind of disability. The former excerpts in this subchapter provides enlightenment about the negative issue as well as the inclusion of PWDs in DRR programs.

Definition of Terms

Disaster Risk Reduction (DRR) is an image that practices the reduction of causal factors of disaster with the use of systematic efforts. (United Nations International Strategy for Disaster Reduction, 2015)

Persons with disabilities are those experiencing dilemma that resulted different capabilities due to a mental, physical or emotional handicap which hinders their activity performance in the manner that is considered normal for an individual (Magna Carta for PWD; Rubiano, 1992)

Implementation is a collaboration with the health-care professionals to utilized and execute an individual plan of care for the patient (Oxford University Press, 2020)

Impairment are those that describe to have any deficiency of psychological or physiological activity that differ from what is normal (Magna Carta for PWD; Rubiano, 1992)

Magna Carta for PWD is a law that provides the self-development and self-reliance of PWDs and their involvement and inclusion to the society (Magna Carta for PWD; Rubiano, 1992)

Mental Health Law is a law that produces legitimate guidelines which conveys crucial issues concerning persons with mental disorders, in which promotes their civil rights in all aspects (World Health Organization, 2003)

Occupational therapy is a profession that aids people with disabilities to perform their tasks and job properly through training and modification or activities incorporated in a therapy session (American Occupational Therapy Association, 2020)

Physical therapy is a profession uses extensive and evidence-based clinical applications to aid person in restoring, maintaining, and promoting physical activities to achieve optimal function (American Physical Therapy Association, 2020)

PRISMA is an evidence-based basis used for assessing and deducting a broad number of researches, minimizing the number of the studies which are used specifically for literature and systematic reviews (Preferred Reporting Items for Systematic Reviews and Meta-Analyses, 2015)

Psychological Distress is thought by many as depression and anxiety. It has both mental and physical symptoms that differ with the normal fluctuations of mood in most people. (American Psychological Association, 2020)

Rehabilitation is an integrated approach that creates conditions to achieve the optimal functional capability of an individual (Magna Carta for PWD; Rubiano, 1992)

METHODOLOGY

Research Design

The researchers chose to utilize descriptive literature review which provides a rundown of a particular concept. The researchers aimed to make summarized results from different articles found in various search engines. Thus, descriptive literature review could help the researchers in achieving their goal by means of determining the extent of a knowledge in specific topics through analyzing and synthesizing information that could lead to analytical summarized results. Moreover, according to Bloomsburg University of Pennsylvania 2020, the sole purpose of literature review is to convey to the reader the knowledge and insights that have been established about a particular topic. This could be achieved by means of providing narrowed comprehensive synthesis of discussions via deducting broad concepts into a tapered combination of ideas.

Research Locale

The country Philippines was the chosen research locale considering the country is more prone to disaster and according to the Center for Excellence in Disaster Management and Humanitarian Assistance 2018, the Philippines has a vast susceptibility to natural disasters which are accredited to the country's geographic location in Southeast Asia. Tsunamis, volcanic eruptions, geographic location and earthquakes are relevant to the country's alias- "the Ring of Fire". As affirmed by Johnson 2017, people with disabilities are more likely to die

in a disaster than normal human beings (4:1) and they remain massively excluded for most disaster risk reduction (DRR) management, plans and policies. Additionally, Chavez (2018) uttered that approximately 5.1 million Filipino children with disabilities will be the one who will most suffer when a calamity hit the Philippines since they still need supervision from adults.

These mustered information's inspired the researchers to choose the Philippines as the research locale along with the persons with disabilities as the target audience. The disaster risks reduction had also been decided to be the concept of this study since the Philippines is highly susceptible to natural calamities.

Data Gathering Technique

Search Strategy

Four (4) credible search engines namely Herdin, PubMed, ScienceDirect, and SAGE Journals were carried out. These databases were chosen since various articles could be found in these engines. The search was limited to a 10-year period (2010–2020). The search strategy was constructed based on four keywords which are 'disaster', 'reduction', 'PWDs' and 'Philippines'. Initially, the researchers used the keyword "persons with disabilities and disasters" in searching on all databases. With these keywords, 3 articles showed up on Herdin that is related to the research topic of this study. However, as for the other three search engines, results came up in broad-ranging articles that do not respond to the research question. Hence, the researchers utilized the Boolean Operator, modified the keywords and changed it into "person with disabilities", "disaster", and "reduction" with an exclusion of "and" word since it may affect the productive results of the search. The "Philippines" was also added as a keyword in searching on databases since it could deduct the results in which the findings would be focused locally. After associating the Boolean Operator and modifying the keywords in the search, the results unfold a narrowed number of articles from each search engine. In SAGE Journals, the initial number of articles is 6, 390 but after specifying the keywords, only 436 results came out. On the other hand, in PubMed, the initial result was 307 and after putting the modified keywords, there are no articles found. Thus, the researchers exclude the keyword "persons with disabilities" and found 23 journals. Furthermore, the initial search on ScienceDirect yielded zero articles. But with the modified keywords, the results have 278 articles. From these narrowed down numbers of results, the researchers tapered the results further by manually screening the articles. Below is the figure that would represent the search strategy of the researchers.
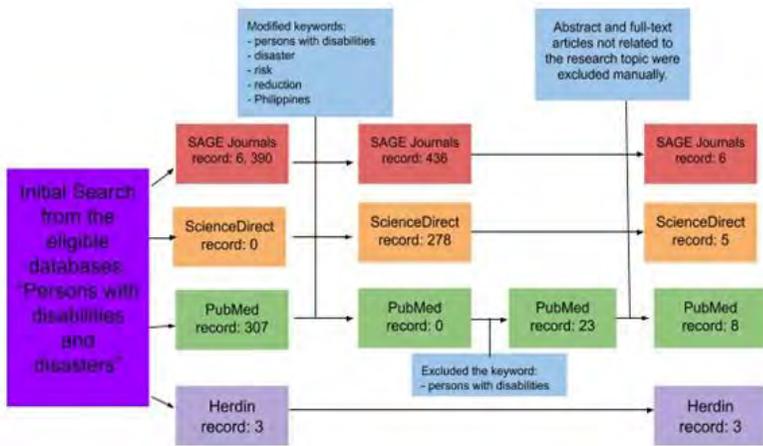
Figure 2 – Search Strategy Flow Chart

Screening and Article Selection

The search for disaster risk reduction management for PWDs in the Philippines was limited to the English-based language articles that contained the results of disaster risk reduction in the Philippines. This study contains only articles that were published in a recent 10-year period (2010–2020 inclusive). Furthermore, this study has approximately 5 articles that tackles disaster risk reduction management which is zero-eyed in the country of the Philippines. The researchers used only four trusted search engines in conduction article selection. The golden thread has been utilized to extract much specific results for the analyzed articles. However, since the objective of the researchers was focused on reviewing disaster risk reduction management for PWDs in the Philippines, journals that focused on other countries aside from the Philippines were excluded. Moreover, systematic review articles that appeared in the search result, and articles for which the full-text were not accessible to the researchers were also excluded. Also, articles that were published before 2010 were excluded. Upon searching on credible search engines, 6, 700 articles were found initially using the raw keywords. But these articles were extracted to 740 using the modified keywords. From these 740 articles, only 22 articles have a relation to the research topic. Thus, a total of 22 articles that have a relation with risk disaster management in various forms whether man-made or natural disaster were included initially in this study. However, the researchers further extracted the 22 articles. The researchers excluded articles that had no access to full-text versions. Then, only 16 significant articles

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including the news articles were retained. These 16 significant articles were deducted as to the ones that could answer the research objectives and from there, only five articles officially remained. Below is the table representation of the summarized extraction of articles.
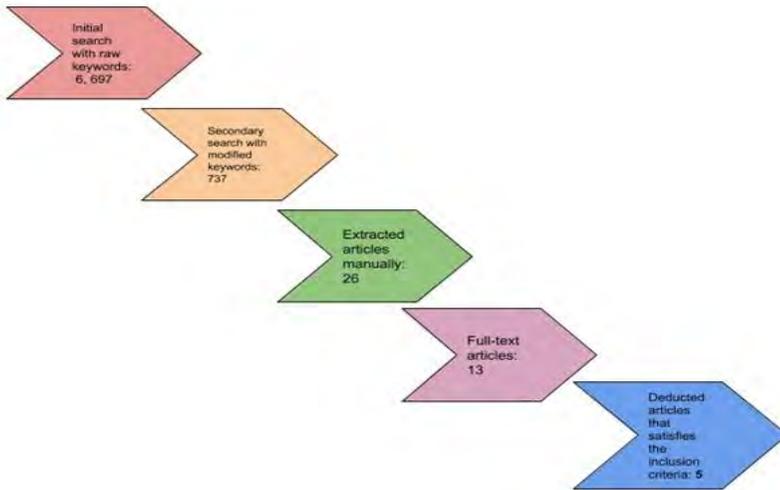
Figure 3 – Summary of extraction of articles

DATA ANALYSIS AND PRESENTATION

Data Analysis and Presentation

This chapter of the study includes the presentation and analysis as well as the interpretation of findings based on the specific problems cited previously in Chapter I. The researchers provided graphs and charts to present the data found.

Article Selection Process

The thorough process of article selection is shown in Figure 3. Only six studies were included in this literature review. The indicated results in these six papers were investigated and extracted by the researchers.
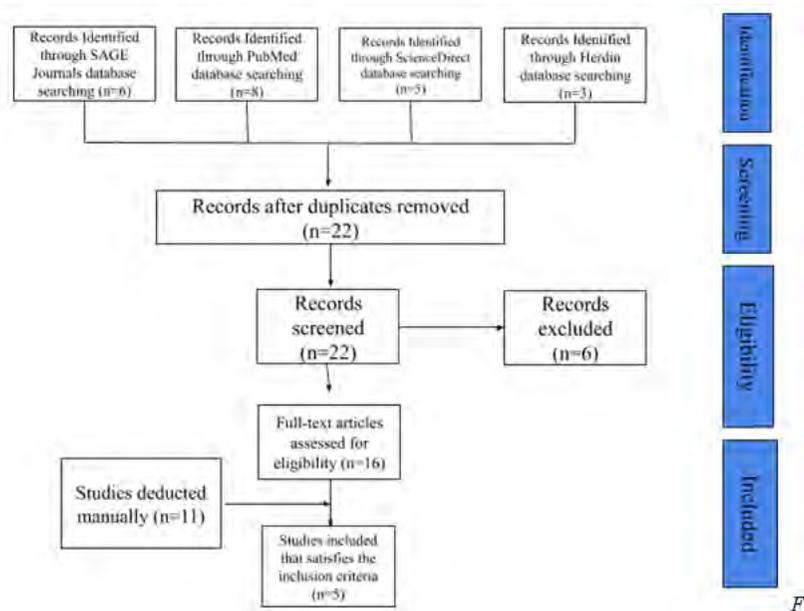
Figure 4 – The PRISMA-based article selection process flow chart

Golden Thread of Extracted Information

The five articles were read thoroughly one by one. The researchers summarized the detailed results of extracted information from these five articles which are presented in Table 1.0 using the Golden Thread presentation.

DISCUSSION

Findings

The five articles that are included in this study were subdivided based on their concept regarding disaster management phases- Pre-disaster Phase, During-disaster Phase, and Post-disaster Phase. The table 1.1 represents the division of five articles into the aforementioned three phases which were categorized into three parts- disaster management phase, author & title, and description of its characteristics.

Disaster Management Phases	Author & Year of Articles	Characteristics
<u>Pre-disaster Phase</u>	• Carcellar et al. (2011)	Showed that addressing and identifying the needs of an individual then implementing DRR programs in a simple, facilitative manner resulted to a efficient productivity of a community
		Exhibited that psychological distress was the prevalent condition in Quezon City and Ligao City
	• Marella et al. (2016)	Manifested that the use of "Audio Safety Reminder" has a fruitful improvement in disaster preparedness of visually-challenged individuals
	• Danglipen et al. (2017)	Showed that OTs and PTs has a vital role in spreading emergency preparation and awareness for children with disabilities for a disaster
	• Aison et al. (2018)	Concluded that the independence level and QOL markedly influence the disaster preparedness of PWDs which would prompt the Physical Therapists in advocating actions for the functional mobility improvement
	• Albarracin et al. (2013)	
<u>During-disaster Phase</u>	• Aison et al. (2018)	Exhibited that OTs and PTs has a vital role in during-disaster management as to trainer, educator, and collaborator, developer and facilitator

Post-disaster Phase	• Aison et al. (2018)	Exhibited that OTs and PTs has a vital role in post-disaster management as to being a counselor

Pre-Disaster Management - The independence level and quality of life has an impact on preparing for the disaster of PWDs as per the statement of Albarracin et al. (2013). The rehabilitation team specifically the Physical Therapists may be prompted by this statement to promote interventions that would help improve the functional mobility of the PWDs. These functional mobilities may be addressed with the use of modifications and tools such as the use of Audio Safety Reminder for visually challenged individuals since according to Danglipen et al. (2017), it has an effect in improving disaster preparedness of visually challenged persons. Moreover, the study of Cercellar et al. (2011) showed that preceding plan and management in disaster-affected communities enabled the residents to act on the rehabilitation agenda independently. Analyzing and addressing the prominent factors to evacuation decisions is the key input to evacuation management.

During-Disaster Management - The study of Aison et al. (2018) showed that therapists such as occupational therapists as well as physical therapists have a crucial role in disaster risk management. These therapists could be facilitators and collaborators which aid the persons with disabilities when a disaster occurs.

Post-Disaster Management - Occupational therapists and physical therapists could be educators, trainers and developers after a disaster occurred in order to help persons with disabilities coping and getting up after a calamity hit them which demonstrated by Aison et al. (2018).

Discussion

At first, the researchers reviewed some related literatures that show discrimination to PWDs. However, as the researchers proceed with article selection, the researchers found five articles that support and facilitate disability-inclusion in DRR programs.

Carcellar et al. (2011) showed effects of the rehabilitation were described in 3 ways: mustering information which consists of evaluating the range of a PWD's need, saving for support in terms of identifying the PWD's possible means of self-sustainability and negotiation for land acquisition which means PWD's own property where he/she can stay to build a home. This result brings about the DRR management a return-to-function status giving the PWD a chance to be a productive member of the society and contribute to it just like other people.

One of the articles which tackles post-disaster phases, Marella et al. (2016) which has an outcome of PWDs have psychological distress brought about the danger of various calamities in the area where they are residing. Psychological distress experienced by PWDs are expressed through sensory, physical, cognitive or communication difficulties. Result of the study gives DRR management ideals as to what rehabilitation setting must be given priority in order to give a better quality of life for PWDs along with the assurance of assistance when unprecedented events happen.

Albarracin et al. (2013) disaster preparedness of a PWD depends on quality of life. Increasing their level of independence with the help of Physical Therapy by providing several assistive devices and modification vastly increases their willingness to participate and apply disaster training.

When it comes to tackling awareness, Danglipen et al. (2017) talks about the use of Audio Safety Reminders for visually-challenged individuals in preparation for evacuation from disasters. This enhances the effectiveness and efficiency of their independence as to awareness. The result shows that modificatory devices can increase the chances of survival, give clear instructions and directions to PWDs with visual impairment which allows them to be independent. Both Occupational and Physical therapists could act as educators and trainers in raising awareness to the surroundings and preparedness in return vastly increases survivability, act as developers and facilitators upon the post-disaster phase of DRR management.

Guernsey et al. (2017) describes resisting disability-based discrimination as an existing entity in the society which places PWDs in subtle-portrayal category of "incapable". The article states that this adversity can be turned to a powerful tool to encourage PWDs to enhance their independence level and showcase their ability to participate. This article raises awareness that PWDs are capable in many ways given they are provided with knowledge, proper assistive devices and being recognized as a valuable part of society. They must be included in DRR management and be taken with great concern.

On the other hand, Luardo (2017) wrote a national DRR management conference with approximately 150 participants from different PWD and government units united to tackle DRR plans pertaining to PWDs and their welfare. This describes that not all people do discriminate against PWDs. There are people who know that equality in this dire time is necessary for a nation to function properly. PWDs are valued citizens of our nation and they are included in the decision-making factors as to precautionary measures.

Not all disasters are accurately predicted and premeditated. However, the aforementioned excerpts from various articles showed a strong argument that the Philippines itself has Disability-inclusive Disaster Risk Reduction Management programs regarding knowledge about different disasters, improved independence, addressed modifications for evacuation and demonstration of precautionary measures. The objective was met in terms of determining programs in the Philippines that focus primarily on PWDs.

CONCLUSIONS

This study aimed to enumerate and describe disaster risk reduction plans with inclusion of Persons With Disabilities. The researchers found five established disaster risk reduction programs and plans that cater the needs of PWDs. Albarracin et al. (2013) discovered that independence level and quality of life of an individual with disability massively affects their skills in regards with managing disasters independently. On the other hand, Aison et al. (2018) succeeded in facilitating disaster-inclusive DRR programs with the help from physical therapists who play a vital role as to being trainers, educators and collaborators during the response phase disaster management as well as developers and facilitators during the recovery phase. Danglipen et al. (2017), Albarracin et al. (2013), and Aison et al. (2018) primarily affirmed that a modificatory and compensatory approach in established DRR programs, with the help from rehabilitation team, markedly affects the skills if PWDs in terms of preparing and evacuating.

LIMITATIONS

Some potential limitations should be noted in this study. The study focused primarily on the constructed plans and implemented programs regarding reducing disaster risk. Furthermore, the setting of the study was limited to Philippine settings, not catering the neighboring countries. The study was narrowed down to Disaster Risk Reduction management for Persons With Disabilities targets exclusively. The primary sources of information were articles from four search engines. Moreover, the search engines used were limited into five only. Any parameters outside the scope of the study were not included in this research. Due to limited article selection, the information was also limited.

RECOMMENDATIONS

The following recommendations for further research are advised based on the results of this study. The researchers have given access limited to full-text articles only. Perhaps, the study would be extensive if the abstract articles found had a parallel accessible full-text version. The extensibility and variety of articles might influence the findings of the researchers. The articles used in this research are limited to PubMed, SAGE Journals, ScienceDirect and Herdin only. Increasing the number of search engines perhaps could help the researchers to get various and expounded full-text articles. A comprehensive study should be conducted on other related fields where the principles of this study could be applied. Data analysis and discussion might differ depending on the insight of the researcher. The study only focuses on determining disaster risk reduction programs for persons with disabilities. Perhaps a parallel study could be done regarding evaluation of executed disaster risk reduction programs that could justify if the said program was being implemented effectively for persons with disabilities to support this research. The settings of the study were limited to local only, which is the Philippines settings. The study would be possibly comprehensive and boundless if the researchers widen the settings into Asian countries or even international countries. Additionally, the target people in this study were limited to Persons With Disabilities. Maybe, a parallel study could be done where the target person are general citizens so the disaster risk reduction management could be addressed extensively. The researchers wanted to recommend to the future rehabilitation team, specifically physical therapists, to create and facilitate a disability-inclusive disaster risk reduction program to address the special needs of PWDs.

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Automated Customer Satisfaction Survey Using Facial Recognition: An Application of Deep Learning

Marielle Anne V. Balce, Renz Kevin B. Layson, Mark Jerome R. Orsal and Engr. Vernon E. Avila

School of Engineering and Technology

KEYWORDS:

Abstract. Customer satisfaction surveys are trivial to answer in this modern era, some people give irrelevant answers and overestimate or underestimate the service or product offered. This leads to inaccurate feedback which does not assist the improvement of the company's services or products. It is more straightforward to identify the satisfaction level of a customer through his or her facial emotion. With the integration of the traditional customer satisfaction survey and deep learning, the proponents were able to develop an Automated Customer Satisfaction Survey that utilizes facial recognition and facial emotion recognition. To detect the emotion, facial features are extracted with the use of Histogram of Oriented Gradients and Local Binary Patterns. The utilization of the two deep learning techniques delivered an accuracy rate of 71.43 percent on the facial emotion recognition of the respondent.

INTRODUCTION

Answering a Customer Satisfaction Survey Form is trivial for some people. They give irrelevant reviews and sometimes over-rate or under-rate a service without proper basis. Developing an Automated Customer Satisfaction survey that will detect, recognize, and record every participant's face will keep it monitored and avoid irrelevant ratings for the service being evaluated compared to traditional survey form. Traditional surveys are likely to take longer to execute, it takes effort and longer time to gather those feedback and compute every client's satisfaction level. Getting everything automated makes it more efficient and fast to know the companies quality of service and to easily find a room for improvement by analyzing customers insights through their emotions. According to Questback blog study after study it shows that emotions matter more than reason when it comes to customer satisfaction and experience. Digging into the customer feedback will help on understanding the emotional triggers behind your customer's behavior.

Developing a system that automatically analyze the facial expressions of the customers and get the statistics of their service quality will enhance business development, rather than manually computing all the data gathered that will take an extra amount of wasted time. Therefore the proposed system will collect a more active customer feedback data with the use of deep learning, emotion analytics and image processing. Automated CSS will also show credibility on taking a certain customer's insights. The project will include the matching of the selected satisfaction level of the customer from their facial expressions and will be saved on a database that will process data analytics. To make the project efficiently working there are some challenges needs to be considered. First is that its limitation on frontal face only, which means respondents must be facing the device camera up front for accurate detection. Second is that the different sizes and proportionality of their facial features including eyes, nose, mouth and its position including the measurement of every movement in accordance to their emotions. Third is the lighting of the environment, hair (bangs), glasses and make ups. Fourth will be the noises in the background. Fifth, the study will be aiming for fast recognition and classification of faces and emotions. Sixth the implementation of OpenFace Algorithm and Deep Learning.

Rotella P., and Shulani, S., (2012) stated on their study that Customer Satisfaction Survey (CSS) is an essential way of survival for businesses. The best way of extracting satisfaction feedback from customer is asking them. Kenneth, R., and Salini, S. (2011) are convinced

that the content and direction of the questionnaire to analyze the pros and cons of products and performances are important.

Customer satisfaction surveys are defined as instruments that assist companies to measure their clients satisfaction. These surveys are used by companies to know if they have met or exceeded the customer's expectations on their products or services. By knowing the customer's satisfaction level, the company can specify the problems on their products or services and make improvements to achieve the expectations of the customers. The most common type of survey that companies use is the Customer satisfaction survey which consists of a diverse set of questions where the customers will choose from a scale of 1 to 5. 1 being very unsatisfied, 2 being unsatisfied, 3 being neutral, 4 being satisfied, and 5 being very satisfied. CSS surveys enables a company to fix and improve a certain service or product. This enables companies to stabilize their strong points and focus on the improvement of certain weak points that are needed to achieve the customer's satisfaction.

According to Paul Hermin on an Interview facial recognition would be used to detect the emotions of cruise ship passengers and thus interpret their level of satisfaction. Paul Hermin mentioned the possibility of changing menus and adapting activities in case of a detected drop in customer satisfaction. On this proposal the proponents develop a system in which taking satisfactory survey will be efficient and reliable. With combining Customer Satisfaction Survey to a facial recognition program, deep learning and computer networks.

Objectives of the Study
The study aims to develop a customer satisfaction survey system that will recognize the facial expressions to classify the level of satisfaction of a customer receiving a service from a certain company.

Specifically, the study will conduct the following:

- Develop a system that will detect and recognize the face of a person.
- Gather data set of images including variety of facial expression and facial features
- Implement Open-Source Facial Recognition Through OpenFace Algorithm.
- Integration of Customer Service Satisfaction, Facial Recognition, Deep learning, and Local Area Network Based System.
- Receive customer satisfaction survey feedback from the employees and students of Emilio Aguinaldo College Cavite.

- Determine the satisfaction level of the employees and students in the offices of Emilio Aguinaldo College Cavite.

Significance of the Study

As part of the rapidly advancing of technology, people are now seeking for the easiest, efficient method of transaction in any possible way. Emilio Aguinaldo College is one of the institutions taking part of the vast technological upgrade. The implementation of the study will take satisfaction survey into a different level.

1) The Automated CSS will develop efficient and advanced processing of satisfaction survey through deep learning.

2) The Automated CSS will provide credibility of the answer provided by the customers, will lessen the irrationality of the survey answers.

3) The Automated CSS will lessen the work of Research Director's Office for manually collecting the paper version of CSS from all of EAC's office and departments.

Scope and Limitations

The project will focus on developing a prototype and evaluation of the enactment that will easily detect facial expressions and classify each. The customer satisfaction survey system will capture an image of the respondent through a camera that will be passed on a computer which will utilize the OpenFace algorithm. This proposal will be aiming 70% accuracy.

Scope of the study:

1. The study will implement 4 expressions which are (1) Angry - Very Poor (2) Sad Not Good (3) Happy - Good (4) Ecstatic - Very Good

2. The study will use 68 facial landmarks in affine transformation for feature detection,

3. The study will allow 30 numbers of respondents for testing and evaluation of the prototype.

4. The study will use facial recognition for its all access credentials.

5. The system will provide analysis of data per school and offices based on the gathered data.

Limitations:

1. The study will limited to Front face detection only

2. The employees and students of EAC will only be recognized by the system.

3. Defects on the facial features, glasses, mask of the respondent will greatly affect the decision making of the developed system

Definition of Terms

Affine Transformation – Will align images that were captured in a non-ideal camera angle.

Algorithm - Will process the data inputted by the respondents and sort data.

Anaconda - Will provide the tools needed for data science such as Spyder.

Cronbach's Alpha- Formula used to measures the reliability of the questions in the Customer Satisfaction Survey system.

Customer Satisfaction Survey (CSS) - Sets of questions that are used to gather the emotional sentiment of the respondents.

Database – Used to manage, store, and retrieve the gathered data from the customer satisfaction survey results.

Deep Learning - A system that will be incorporated to imitate the decision making of the human brain. By training, deep learning will classify the respondents emotion and facial features.

Facial Recognition – Will identify the respondent's face this will verify the variety of customers face.

HOG (Histogram of Oriented Gradients) -

LAN (Local Area Network) - Will connect the server from the mediums (Tablets) and transferring the data to the server.

LBP (Local Binary Pattern) - Will look for the bright and dark parts of the image (vertically or horizontally)

OpenFace – Contains SVM (Support Vector Machine) and HOG (Histogram of Oriented Gradients) which will set points on images and isolating backgrounds from the face.

Python- An open source programmng language that will be utilized by the algorithm that is OpenFace

Spyder- An environment where Python codes will be interpreted.

Support Vector Machine (SVM) – A classifier that is used in recognizing facial images.

Two-Dimensional face image – Facial image thas has height and width but does not have depth.

Review of Related Literatures

Presented in this part is the review of related literature, studies, principles, and theories that incorporates technical terms from projects associated with the development of the system.

Related Studies

FACIAL RECOGNITION

Humans are considered or known being the most intellectual that have exceptional capabilities of classifying and analysing the difference between people's expression of their feelings, also their remarkable ability to interact and communicate in everyday basis. Facial analysis is the most engaging research topic nowadays which is procuring a lot of recognition and significance. Particularly on recognising facial expressions from images focusing on the specific person's facial features, according to Taha & Hatzinakos (2019) on their study. Liping Chang et al's (2018) stated The most stimulating topics in relate to the field of machine violin and pattern recognition is Face Recognition which also has a wide range of applications. Stated that the role of face features plays an important part in classification. Extraction of the features by tradition methods are said to be simple and elementary. With this problem their solution is to implement stacked convolutional autoencoder (SCAE) that they based on deep learning theory for deeper extraction of features. They use a general classification algorithm: sparse representation that has shown a good object recognition performance.

The face which is mostly used for recognition is the medium of expressions of mental state or a certain person's perspective to others. It is essential and important part of the body R.Brunelli (2009). Adeyanju et al (2015)., in the difference between face recognition system and face

emotion recognition system, human face is recognized by their facial features if the system to be used is a facial recognition system, while the face emotion recognition system was able to identify the specific emotion expressed using facial features. Yu, K., & Yin, J. (2018) on their study on facial recognition states that analyzing the success rate they have designed which has 90% facial gestures rate of success will be affected depending of a certain distance in the middle of light and the camera.

EMOTION RECOGNITION

Lee H.J & Hong K.S (2017) developed a system for perceiving seven sentiments of a person such as anger,disgust,fear,happiness,sadness,surprise,and neutral. The optimistic and pessimistic sentiments were processed using the facial images captured while the applications were established based on deep learning techniques.Tensor flow, an open-source deep-learning library was utilized by the researchers. Robust Convolutional Neural Networks (CNN) was implemented for recognizing images. By obtaining images from videos, a dataset of images was produced. Images that have facial expressions for seven emotions, and they recognized emotion by means of an emotion model created by a convolutional neural network. AV (Arousal Valence) model to calculate positive, negative, and neutral values. In the AV model, the absolute coordinates of the corresponding seven emotions were obtained by holding both ends at from -4 to +4. The coordinates were set to Angry is -3.1, Fear is 2.4, Disgust is -2.3, Sad is -1.5, Surprise is 0.2, Happy is 2.8. The calculated coordinates are multiplied by the probability values obtained from 7 emotion recognition, and the values located in the second and third quadrants are averaged by two, and finally, a total of four values are added. The calculated values are divided into positive, negative, and neutral ranges to indicate emotional states. A dataset with images was created from the extracted video. The data sets were modeled, created, and tested. The size of the image is 180 * 210, and the tests were repeated 30,000 times. The face images with six emotions except for neutral were taken each five times from each of the three twenties men and women participated in the experiment. The recognition rate of seven emotions was calculated by whether the emotions presented match the emotions of the first rank result. Positive and negative emotion recognition rate was calculated whether the results were positive when the proposed emotion was Happy, or negative when Angry, Disgust, Fear, Sad and Surprise.

Y.Yang et al's (2017) on classifying basic emotions stated that basic emotion theory is limited to express subtle and disparate emotions. But by using the model arousal-valence continuous emotion space model. According to their study it is defined that the well known 7% - 38% - 55%

emotion expression criteria means that language holds the 7%, 38% for voice and 55% for facial expression.

Gender Differences

R.Sayik et al's (2018) on their study stated that genders may have a differentiated emotional and cognitive function. Upon testing the theory they have found out that females had female response in both positive face recognition and negative face recognition is a lot faster than males. Through Cambridge Neuropsychological test battery (CANTAB) three working memory tasks which are stocking of Cambridge (SOC), spatial working memory (SWM) and intra or extradiment shift task (IED), Saylik, Raman, and Szameitar concluded the sensitivity of emotional and cognitive functions to sex differences.

R.Sayik et al's (2018) stated on the previous empirical research from Haas et al.,(2006); Doty et al.,(2013); Andric et al.,(2016), due to the intensity of emotional and stress levels the biased attention stimuli increased the level of attentiveness during presentation of emotional stimuli.

Upon their research Kring & Gordon.,(1998), reported that females shows higher intensity of stress and emotional responses. In comparison to males prediction on female attentional biases on their emotional stimuli would be reasonable. The authors cite an example where the findings were females were exceptionally faster in recognizing both positive emotional faces and negative emotional faces by performing an emotional recognition task with the use of facial emotional pictures. Vallaso et al. (2009) also stated that the speed of recognizing faces were a lot faster in females than in males.

DEEP LEARNING

Deep learning in artificial intelligence is a part of the machine learning methods which takes representation of data in a different level. It is a new way of taking representations of statistics from getting to know. The intensity of deep getting to know does not imply a deeper know-how of any kind, but as a substitute represents the concept of successive layers of representation. The intensity of the model is the number of layers that make a contribution to the data model. Additional suitable discipline names include layered representations studying and hierarchical representations mastering. Modern deep getting to know frequently involves tens or even masses of successive layers and is routinely learnt from facts exposure. These representations of the layers are (most of the time) learned in depth thru models called neural networks based in literal layers on every other.

While a neural community has been evolved in component by drawing inspiration from our expertise of brain, profound mastering models are not models of the brain, although some of the central principles for profound getting to know have been evolvedIn 2010, despite the fact that the science community almost completely refrained from neural networks, several people still started out to make crucial breakthroughs such Hinton et. Al.'s (2015) institution at the University of Toronto, Bengio (2015), on the University of Montreal and LeCun (2015) at New York University and IDSIA in Switzerland. In 2011, Ciresan et al. From IDSIA started the primary practical success of present day deep learning in academic image category competitions with GPU-skilled deep neural networks. But 2012 marked a turning point with Hinton's institution being included in the yearly huge-scale ImageNet task in image classification. The project of ImageNet at the time changed into notoriously difficult such that after education on 1.4 million frames, it classified color images in 1000 one-of-a-kind categories. Based on classic methods to computer imaginative and prescient the top 5 accuracy of the winning model was handiest 74.3% in 2011. A pinnacle five accuracy of 83.6%, an essential breakthrough within the group led with the aid of Krizhevsky (2012) and counseled through Hinton took place in 2012. Deep convolutional neural networks have ruled the opposition 12 months after 12 months. By 2015, the winner finished 96.four�curacy, and ImageNet's classification project turned into regarded as a whole problem. Deep convolutional neural networking (convnets) is now the go-to set of rules for all tasks within the discipline of computing vision due to the fact 2012. It was almost not possible to discover shows that did not involve convnets in some shape at predominant computational vision conferences in 2015 and 2016. Deep gaining knowledge of has also been capable of find packages for lots different problems, which include processing in natural languages. In a wide range of packages, it replaced completely SVMs and selection trees. The European Organization for Nuclear Research, CERN, has used tree-based totally strategies for the analysis of particulate records from the Large Hadron Collider's ATLAS detector (LHC) for numerous years. But because of its elevated performance and simplicity of schooling in big statistics systems, CERN switched to Keras - primarily based deep neural networks.

A convolutional neural community (CNN) is created to pick out indicative local predictors in a big shape and combine them on the way to offer a vector representation of the shape of fixed sizes, taking pictures the local components most applicable to the prediction challenge. CNN is essentially an structure that extracts features. It isn't an individual, useful network, but is intended to be incorporated into a bigger network and trained to work along it to produce a result. The obligation of the CNN layer lies in extracting huge substructures which might be useful for the overall prediction undertaking. But 2012 marked a turning factor with Hinton's

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OPENFACE

Amos et al's. (2016) study features an open source facial recognition model which is on-par with private facial recognition models such as FaceNet and delivers near human accuracy on recognizing the face of a person. The accuracy of the model was verified by Labeled Faced in the Wild (LFW) which is a benchmarking tool for facial verification, the tests showed that the performance of OpenFace is near the performance of private face recognition models.

The design of their research focused on the mobility of the system, where the user can utilize the system in real-time and is adaptive to certain circumstances. The researchers considered a system that is accurate even though the training and prediction time for the system is low. Torch, Lua, and LuaJIT was used for training the neural network and the conjecture portions of the system. NumPy was used for the linear algebraic operations and arrays, Scikit learn and OpenCV was maximized for classification and dimension reduction. The structure of the system was a challenge to the architecture of neural networks this resulted to the use of FaceNet's architectural system design. The pre-trained face detection system of Dlib was adopted by the research because of the high accuracy it can generate rather than the face detector of OpenCV.

Affine transformation is a technique that the researchers applied on face mapping. The affine transform assisted the system on rectifying the geometric deformations that are occurrent on camera angles that are non-ideal. With the use of affine transform, the image gathered is reduced in size and cropped which results in lower data storage.

OpenFace was trained with only 500,000 images which is numerously lower than FaceNet's 200 Million and 4.4 Million of DeepFace's image. A redesigned version FaceNet's network was utilized by OpenFace which deducted the specifications for the smaller data set that OpenFace gathered. Regardless of the smaller data set the performance of OpenFace was on-par with facebook's DeepFace and Google's FaceNet and other exclusive facial recognition system. The accuracy of OpenFace was verified through Labeled Faces in the Wild (LFW) and it showed that it can compete with exclusive systems.

On Baltrusaitis, Robinson, and Morency (2016) study they utilized the OpenFace as an instrument for the detection of facial behaviour of an individual. The researchers used OpenFace's facial landmark detection and tracking, estimation of head location, estimation of eye location, and the detection of action unit. In order to extract facial appearance features the researchers used a similarity transform from the currently detected landmarks to a representation of frontal landmarks from a neutral expression.

https://goo.gl/D1k7LH
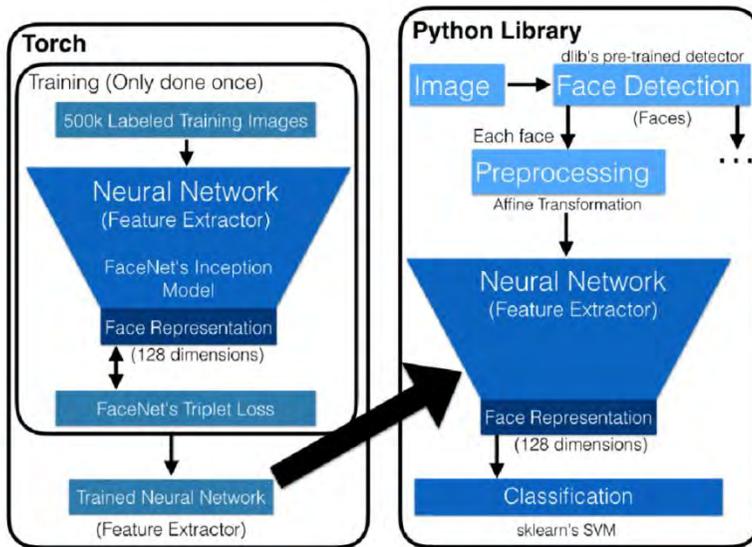
Figure 1: Torch System Diagram

According to Stephanie Kim(2018) the openface recognition works from an elevated level viewpoint, OpenFace utilizes Torch. This prepared neural net which is later utilized in the Python execution after new pictures are gone through dlib's face-identification model. When the faces are standardized by OpenCV's Affine change so all faces are arranged a similar way, they are sent through the prepared neural net in a solitary forward pass. This outcomes in 128 facial embeddings utilized for arrangement for coordinating or can even be utilized in a bunching calculation for similarity detection.

Table 2: Action Unit Table

Level 1:
AU4   AU44   AU15
AU9   AU2
Level 2:
AU1   AU14 AU17 AU25
         AU10   AU28   AU23
Level 3: AU7 AU20 AU12
Level 4: AU6 AU26

AU	Full name	Illustration
AU1	INNER BROW RAISER	
AU2	OUTER BROW RAISER	
AU4	BROW LOWERER	
AU5	UPPER LID RAISER	
AU6	CHEEK RAISER	
AU7	LID TIGHTENER	
AU9	NOSE WRINKLER	
AU10	UPPER LIP RAISER	
AU12	LIP CORNER PULLER	
AU14	DIMPLER	
AU15	LIP CORNER DEPRESSOR	
AU17	CHIN RAISER	
AU20	LIP STRETCHED	
AU23	LIP TIGHTENER	
AU25	LIPS PART	
AU26	JAW DROP	
AU28	LIP SUCK	
AU45	BLINK	

Tensorflow

According to study of Zeng et.al (2019) Tensorflow is an open-source profound learning system created by Google. Its front end bolsters numerous improvement dialects, for example, Python, C++, and Java, etc. The backend is composed with C++, CUDA, etc. The calculations executed in this structure can be effortlessly transplanted on numerous heterogeneous frameworks. It is supported by numerous engineers. It can execute line and string activities from the base layer, rapidly call equipment assets, give input information, diagram hub structure and article capacity, and afterward it can appoint hubs to numerous gadgets for equal activity. In this paper, the signal acknowledgment model dependent on convolution neural system is worked under the Tensorflow structure, and the essential system is planned. After the system

boundaries are enhanced, the acknowledgment impact of the system is broke down.

Zheng et. al. (2019) CNN Model Design of Gesture Recognition Based on Tensorflow Framework

Scikit-Learn

Abraham et.al. (2014) stated that Scikit-learn are a broadly useful AI library written in Python. It gives productive usage of cutting edge calculations, available to non-AI specialists, and reusable across logical controls and application fields. It likewise exploits Python intuitiveness and seclusion to gracefully quick and simple prototyping. There is an assortment of other learning bundles.

According to Hwang et.al (2018) Python has been received to as the fundamental advancement device going with the Scikit-learn [3] bundles of numpy (logical figuring), sklearn (AI), and scipy (science and factual processing) to compute the kurtosis and skewness in measurements of each driving course, at that point choice tree grouping method was applied to create the investigating information for driver conduct examination.

Abraham et.al. (2014) Machine learning for neuroimaging with scikit-learn

Hwang et.al. (2018) Apply Scikit-Learn in Python to Analyze Driver Behavior Based on OBD Data

Local Binary Patterns (LBP)

Bouchika et.al. (2015) stated that LBP can be proficiently and quickly registered in a solitary picture check offering facial recognition abilities in any event, alike for unclear pictures. The operator sets the pixels of sampled picture by thresholding each number of the nearby pixels against the inside pixel inside a 3x3 grid and subsequently, coming about a progression of estimations of sequential 1 or 0. By perusing a similar way of the bolt, composed of binary numbers it is translated into decimal number i.e a number composed of binary number: 11010011 translated into 211 the decimal value of the binary. The 256 layers histogram of the subsequent names is registered and utilized as a surface descriptor for facial-based applications.

Bouchika et.al. (2015) Automated Clustering and Estimation of Age Groups from Face Images using the Local Binary Pattern Operator

Support Vector Machine (SVM)

Adeyanju et al., 2015 stated that on identifying six different emotions and achieved an average accuracy of 87.9%, Support vector machine has been used for recognizing emotions in still images and video images using a single SVM kernel function (Radial Basis Function). Their paper analyzed the performance of four different SVM kernels for the classification of seven face emotions. The quadratic function kernel outperformed the other three kernels in terms of percentage accuracy. The average accuracy increased with increasing image dimension of the extracted features. However the trend of the computational time was non-uniform and therefore inconclusive.

Histogram of Oriented Gradients (HOG)

Maraskolhe, P. N., & Bhalchandra, A. S. (2019) on their study on Analysis of Facial Expression Recognition using HOG, concluded that the Histogram of Oriented Gradients when utilized and extracted is a technique effectively recognizing facial expression. It can also be implemented on a real-time application that identifies facial part, these techniques are expected to be used on Automatic Emotion Formation on Robot Face and also on accuracy incrementation of huge amount of databases by training. Combining HOG and other features can also increase the effectiveness of the techniques on respective rates of recognition. Histograms of Oriented Gradients (HOGs) features from the aligned face were extracted, the framework allows the saving of these intermediate features aligned faces together with actual and dimensionality reduced HOGs, as they are useful for a number of facial behavior analysis tasks. The researchers evaluated each of the OpenFace sub-systems: facial landmark detection, head pose estimation, eye gaze estimation, and facial Action Unit detection .Baltrusaitis, Robinson, and Morency (2016). Maraskolhe, P. N., & Bhalchandra, A. S. (2019) used HOG to classify three facial expressions, which are happy, sad and neutral. They extracted components of three sample data sets of images of mouth, eye pair, and nose on their first step. Magnitude of 60, 10, 10 were utilized with respect to the components while extracting the images and on their second step, they extracted the HOG classifier of the three diff attribute image, acquiring feature vector throughout extraction.

CUSTOMER SATISFACTION SURVEY

On Gan, Y., & Li, D. (2013) study they utilized the method of convenience sampling. The sample population is a group of students from a university while the investigation object is the brands of mobile phones used by this group. 300 copies of the questionnaire were distributed, and 285 copies were returned, among which 279 copies were valid

questionnaires. Valid questionnaires account for 93% of all questionnaires. To ensure the soundness and stability of the questionnaire, Cronbach alpha was used to measure the reliability of the questionnaire. Wherein the values of Cronbach alpha for customer satisfaction, switching costs, trust and customer relationship commitment are respectively 0.905, 0.661, 0.896 and 0.915. The Cronbach alpha values for the four variables are greater than 0.65. Therefore, the internal consistency and stability of the study variables are relatively good on the whole, resulting in a high degree of reliability. This indicates a strong correlation between the study variables and corresponding scale, which proves the good reliability of this questionnaire.

According to Gan, Y., & Li, D. (2013) customer satisfaction is a prerequisite for lasting relationships between consumers and businesses. If customers are not satisfied, customer loss is inevitable. Let alone the lasting relationship commitment. However, customer satisfaction cannot ensure a solid relationship commitment. The customers may terminate or suspend their relationship commitment to business due to other factors. From the customers' perspective, switching costs is actually an investment by the consumers, including the investment in time, money and human capital. High switching costs often means more time, energy and money invested in early stages as well as stronger ties between consumers and specific businesses.

Karim et al's (2018) developed a prototype system design that identifies a customer's, gender, emotion, and age. Their study revolves around identifying blacklisted customers, identifying members of loyalty schemes, and giving rewards for special customers. The active collection of customer feedback information through the use of video analytics, deep learning, and image processing was utilized to ensure that the data collected was not relying on the transaction data alone. In order to classify the sentiment of customers, a convolutional neural network was used (CNN) To classify emotions into three classes, positive, neutral, and negative, the number of neurons in the output layer of the network was changed to 3. Initially, the network was trained on the extended Cohn-Kanade dataset Each sequence is constructed from a neutral expression in the first frame changing to the last frame containing a peak expression. Since the subjects portray seven different expressions, anger, contempt, disgust, fear, happiness, sadness, and surprise, we took the frames containing the peak anger, contempt, disgust, and sadness expressions as negative images, and the frames containing the peak happy expression as positive images.

Related Literature

Affine Transformation

Weisstein, Eric W. "Affine Transformation" described that affine transformation is any type of transform that maintains the points, straight lines, and planes after transforming. This technique is used in correcting geometric distortions that occur when the camera angle is non-ideal.
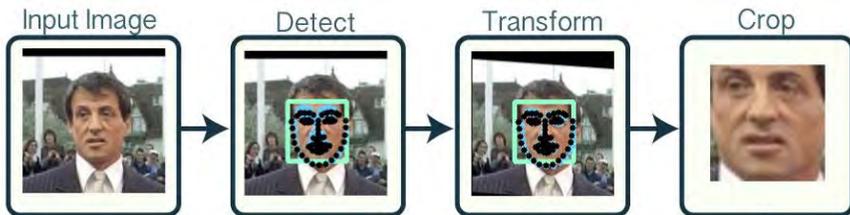

Figure 2: Affine Transformation

Cronhbach's Alpha

Lee Joseph Cronbach (1951) presented a paper known as "Alpha" where it shows a system for regulating the reliability of educational and psychological tests. Known as the Cronbach's Alpha this formula was implemented on various tests which provided consistent and reliable tests.

N = Number of items

c̄ = <u>average covariance</u> between item-pairs.

$$\alpha = \frac{N \cdot \bar{c}}{\bar{v} + (N-1) \cdot \bar{c}}$$

v̄ = average variance.

Figure 3: Cronbach's Alpha Formula

On an article from The University of Califonia, Los Angeles (UCLA) Statistical Consulting Group. Cronbach's Alpha is defined as an appraisal for reliability. Cronbach's Alpha assesses a company or an institution if the satisfaction surveys provided has a high or low reliability. Likerth Scale surveys are reliable when the test contains multiple questions. The questions evaluate hidden variables such as the

respondent's emotion regarding a certain question about the company or institution.

Table 1: Cronbach's Alpha Acceptability Table

Cronbach's alpha	Internal consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

Confusion Matrix

In the subject of machine learning and particularly on the problem of statistical classification, a confusion matrix, also known as an error matrix is a technique for summarizing the performance of a classifier is utilized. This table shows the numbers of the exact and inexact predictions with scores which are categorized by each class. The confusion matrix represents how the classifier is confused on predicting the classes. The matrix gives a vision on the errors and the types of errors that the classifier generates.

Neural Networks

In the study of Constantini et al. (2006), they proposed a design that compares different approaches specific to the effectiveness of noise removal by recalling images inside a neural network in a way of increasing the level of gray-scale images from 16 to 256 levels. Their study focuses on the effect of the multilevel neural network that as they created a new associative neural design. They trained a R200x200 pixels image and divided into 16 parts which creates 50x50 pixels. In this case, it created more connections inside the network numerically 11,340,000 connections. Creating a large number of sub images into a network makes computational complexity inside the neural network. Their study about Multilevel Neural Network proves effectiveness to the neural network with improving the results of 7 more than the previous one.

In the study of Kolman & Margaliot (2007) the purpose is to prove the most effective input-output ways on Artificial Neural Networks (ANN). For information extraction, the proposed method to be used is by Boolean Function that can state the system using if-then rules. Fuzzy Logic Based System serves as a medium to humans so it can understand in a logical way than the complex form of an ANN. All-Permutation Fuzzy Rules Based System introduced as a complementary to a Feedback Neural Network but in fuzzy reasoning process that creates a new way in simplifying connections by setting rules into a neural networks. Training on the neural network is set on recognition by the digits displayed on a LED Devices. They tested this information extraction method by applying it to an ANN trained to solve the LED identification problem. The 24–6–10 system was changed into a lot of 64 fuzzy rules. Simplifying this set of rules prompted a conceivable representation of the ANN's working. For instance, it is conceivable to reason that the ANN figured out how to put an accentuation on the particular digits that are increasingly hard to perceive.

Python

Downey A. (2009) stated that Python is an object-oriented, interpreted and high level programming language with the dynamic semantics. There are also low-level languages, now and then referred to as "machine languages" or "assembly languages." Loosely, computers can just run programs written in low level languages. So programs written in a high-level language must be handled before they can run. This additional processing takes some time, which is a little disadvantage of high-level languages.

Python is a programming language that has a simple structure and has a clearly defined syntax. It also can run on a wide variety of hardware platforms. Python supports structured and functional programming methods. For building large applications, it is used as a scripting language. It can integrate with C++, COM, C, Cobra, active x, and java, it can easily be integrated to that programing language.

Convolutional Neural Networks (CNN)

Convolutional Neural Networks (CNNs) are a category of Neural Networks that have proven very effective in areas such as image recognition and classification. CNNs have been successful in identifying faces, objects and traffic signs apart from powering vision in robots and self driving cars.

Multi-Task Convolutional Neural Network (MTCNN)

According to Jose, E., M., G., T. P., M. H., & M. H., S. (2019) on their study on Face Recognition based Surveillance System Using FaceNet and MTCNN, MTCNN is an face and facial landmark detection algorithm that consist of 3 stages which are (1) Proposal network which speculate potential face ponts and bounded boxes. (2) Refinement of the result that will be removing most of the false detections and aggregate bounding boxes. (3) Adds facial landmark prediction.

Xuefeng Chen et al's (2019) on their study on MTCNN face detection used eye localization algorithm to aim the inaccuracy of getting the regression point of the human eyes due to lack of image resolution where they focus on segmenting the eyebrow area depending on the area of the face and the postion of its pupil that is acquired by MTCNN. They also used gray gradient integral projection for the eyebrows horizontal projection and vertical projection. In their study they reach an experimental result of 95.02% of detection accuracy and a better eye image detection robustness even with a low-quality set of image.

Related Readings

Data Privacy Act

Due to increasing demands of innovative way of living of a human living, Facial tracking and recognition seems to be further element on our daily act. Especially on the business side, different institutions consolidates face recognition as a medium to assist their consumers. For instance, people tend to use more encrypted facial tracking security on their gadgets instead of using passwords. Tourist spots and other locations are considered the use of face recognition in collecting images for their customers that on their vacation. Different upcoming applications are acknowledged by economic market but yet in improvement phases for efficiency advancement. (Leong, B., 2018)

Two US Senators Brian Schatz and Roy Blunt wants to secure face tracking information for the population and to make it significantly harder to sell data as cash. The lawmakers proposed the 2019 Commercial Facial Recognition Privacy Act that constrains institutions from gathering and redistribute face data in terms of classifying or to record intentionally without approval of individuals. Arguments are made due to several folks are oblivious that the machineries is being employed to guard and supervised for many years and that they will compile detectable information to stake or market to mediators. The reality is, whereas Face tracking has been employed over many years for safeguarding and supervisions, it's refined at associate growing percentage for industrial applications. (Blunt, 2019)

Anti-Photo and Video Voyeurism Act

The Anti-Photo and Video Voyeurism Act of 2009 or Republic Act No. 9995 Under this law it is illegal to take, copy or reproduce, sell or distribute, publish or broadcast photos or videos of a person /group of persons performing sexual act or any similar activity, of the private area of a person/s – the naked or undergarment-clad genitals or pubic area, buttocks or female breast – without the consent of the person/s involved, or under circumstances in which the person/s has/have can reasonably expect privacy. This law, passed in 2009, penalizes these acts by imprisonment of three to seven years, a fine of P100,000.00 to P500,000., or both. (Anti-Photo and Video Voyeurism Act of 2009)

According to Flynn and Henry (2016) Technology became a threat in terms of non-consent images which can be resulted into a scandalous occasion. Image-based sexual abuse (IBSA) is created by the use technology to spread a threat into a certain individual which can be blackmailed by the perpetrator. In their study, by the ages of 16-49 one in five Australians has been involved into IBSA. A study on 2016 led by Lenhart, Ybarra, and Price-Feeney, by the age of 15-29 years old, 4% of male and 6% of females expressed that their photos whether it's naked or semi-naked shared without their approval. Numbers like this is alarming even its low but the real problem with IBSA is the pervasiveness of the crime within the public.

Violators of IBSA can be around with relatives, colleagues, friends, and even stalker or strangers to the victim. Different motives like sexual satisfaction, retaliation, coercive control, social reputation, money related, and voyeurism. The photos might naturally done by the victim through what we called now "selfie" or created in agreement with regards to a relationship. On the other hand, pictures might be carefully changed, taken secretly out in the open or private settings, or made coercively, or they may have been taken of a rape or assault. While IBSA isn't itself new, innovation has made a helpful and huge scale stage for such maltreatment to happen.

Cross-Border Privacy Rules

The Asia-Pacific Economic Corporation (APEC) recommended a system that will further improve the privacy and security of data within the APEC regions. This system is know as the APEC Cross-Border Privacy Rules system, the CBPR a privacy framework that was recognized by all of the APEC region leaders. The system provides a standard for public and private side of a country connected to APEC. The Cross-Border Privacy Rules System aids in the protection of the information of an individual or an institution by having their privacy rules assessed by a certified third-party auditor which is know as an Accountability Agent. With the rapid growth of technology in the country and rising concerns about

the data privacy in the country. On the 20th of September the year 2019, the government agency known as the Philippine National Privacy Commission (NPC) disclosed that they have filed an intent to join the APEC CBPR system.

Synthesis

The study focuses on utilizing two-dimensional facial image recognition for the acquisition of the emotional sentiments of the respondents regarding the Customer Satisfaction Surveys provided. With the use of an open-source algorithm, this study aims to integrate the traditional way of administrating Customer Satisfaction Surveys which can improve the effiency and eliminate dishonesty on the institution.

The feasibility of this study was justified through the related studies that were reviewed by the researchers. The study conducted by Amos et al's (2016) demonstrated an open-source algorithm for facial recognition which is called OpenFace. The training of the algorithm utilizes Torch, a scientific computational framework which aids on minimizing the training of data sets in the system. The algorithm implements OpenCV's Affine Transformation which orients all of the faces gather in one direction. 128 facial embeds aids the classification and similarity detection of the system.

The study conducted by Lee H.J & Hong K.S (2017) on the emotional sentiments recognition stated that deep learning techniques such as Convolutional Neural Networks were necessary in recognizing images and the emotions of the person. The Arousal Valence model was used in calculating the positive, negative, and neutral values of the emotional sentiment of the respondent. On the study of Y.Yang et al's (2017) by using the Arousal Valence model the emotion theory will not be limited to subtle and disparate emotions.

On Gan, Y., & Li, D. (2013) study utilized the formula known as Cronbach's Alpha to acquire a reliable and consistent Customer Satisfaction Survey.

The researchers concluded to focus on developing a Customer Satisfaction Survey System which utilizes frontal face recognition with the use of OpenFace algorithm. This algorithm utilizes the action unit detection which will fill the research gap on other studies. The system to be designed is intended for institutions that implements customer satisfaction surveys.

INTRODUCTION

Face Recognition is the fastest biometric technology to identify human faces, and as the most significant part of computer vision due to its importance it has received substantial recognition in the past several years due to its potential for a wide variety of applications, where computer adopts the human capability of storing facial images and being able to classify and recognize each. Integrating facial recognition to a system adds up to its automation, security and monitoring features. An Automated Customer Satisfaction Survey with facial recognition that implies the application of deep learning, and uses the powerful openface as its algorithm makes taking survey easy, efficient, faster and reliable. The problem is that utilizing facial recognition considers a certain number of factors that may affect the accuracy of its detection and recognition one example of that is the different angles, luminance, facial deformities and different facial action unit to determine a certain expressions or emotions.

METHODOLOGY
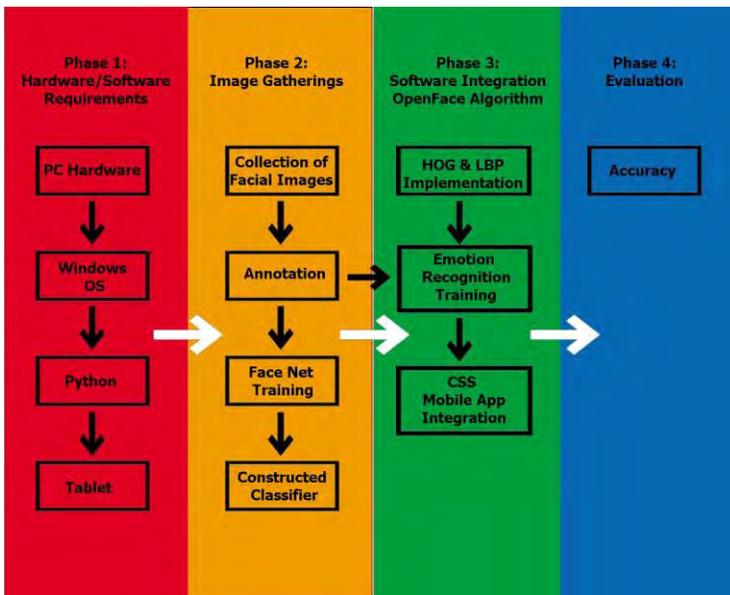
Figure 4: Conceptual Framework

The project was divided into five phases that involves (1) Identification of software and hardware requirements of the system to be integrated; (2) Data gathering and annotation of specific feature to be classified for detection and recognition; Facenet training (3) Implementation of algorithm face detection and recognition model; System; Utilization of HOG (Histogram Oriented Gradients) and LBP (Local Binary Pattern); Emotion Recognition Training; Integration of CSS mobile application with all the other system : Facial Recognition and Automated CSS (4) Last is the evaluation and testing of the system's accuracy.

Phase 1: Software and Hardware Requirements

Hardware Classification

Nvidia GeForce GTX 1650

The Nvidia GTX 1650 is a popular graphics processing unit (GPU) that was released on the 23rd of April the year 2019. With Nvidia's award winning Turing architecture, this architecture enables the GPU to be more efficient and over all increase the performance with regards to the performance per price it conveys. The specifications of the Nvidia GeForce GTX 1650 are listed below.

GPU Engine Specs:

- Nvidia CUDA Cores   896
- Boost Clock (MHz)   1665
- Base Clock (MHz)   1485

Memory Specs:

- Memory speed   8Gbps
- Standard Memory Config   4gb GDDR5
- Memory Interface Width 128-bit
- Memory Bandwidth (GB/s)   128

Compute Capability :   7.5   Minimum   for   Deep Learning : 3.5

Intel Core i3-9100f

A quad-core CPU that has 3.6GHz base clock speed and a boost speed of 4.2 GHz. Intel Core i3-9100F was released on the 23rd of April the year 2019, this CPU utilizes Intel Advanced Vector Extensions 2 (AVX2.0) which increases the performance of deep learning applications. The specifications of the Intel Core i3-9100f are listed below.

- Number of CPU Cores: 4
- Number of Threads: 4
- Base Clock: 3.6 GHz
- Max Boost Clock: Up to 4.2 GHz
- Cache   6   MB   Intel®   Smart Cache
- CMOS: 14nm

Software Classification

Spyder (Python 3.7)

Spyder is an open source scientific python environment that is incorporated with Anaconda. Spyder integrates packages such as Numphy, Sciphy, Matplotlib, and other open source. Spyder offers a special combination of analysis, advanced editing, debugging, and profiling. Spyder embeds Python distict code and aids interactive tools for data inspection.

XAMPP

An open source cross-platform web server solution package. X stands for Cross platform, A stands for Apache, M stands for MariaDB, P stands for Php, and P stands for Perl. It converts private desktops or laptops to become a local host or local server. XAMPP is utilized to test the clients or your website prior to uploading to a remote server. XAMPP provides an appropriate environment for testing MYSQL, PHP, Apache, and Perl projects on the local server.
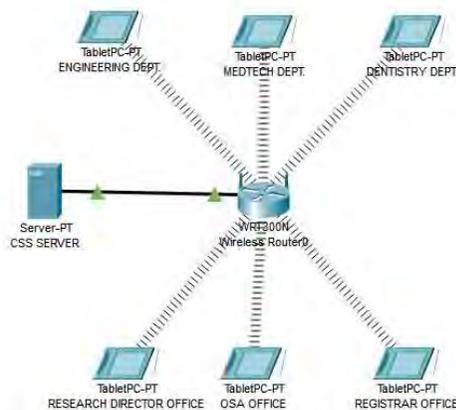
Figure 5: Network Diagram
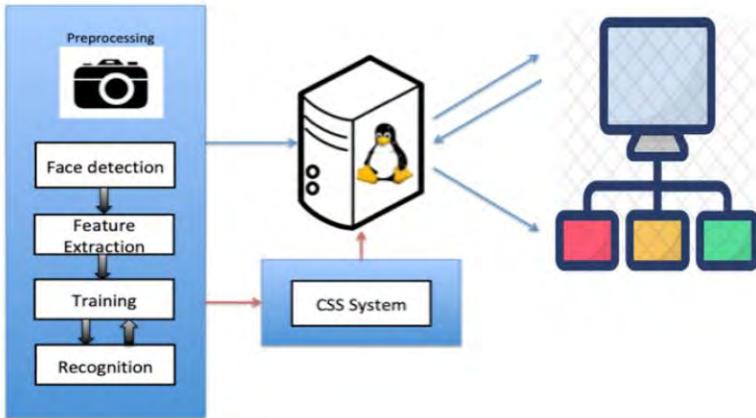
Figure 6: Pictorial System Diagram

Phase 2.1 : Image Gathering

To reach a certain point of accuracy a deep learning type of machines are trained with thousands of datasets. Facenet on the otherhand had a thousands of pre-trained data. For deep learning machines to learn it needs to be fed numerous of data for a more fine and distinct extraction. In this phase, the proponents will capture and collect images of different frontal face from 3 different schools and 3 offices, those offices and school includes School of Medical Technology, School of Engineering, and School of Dentistry, Registration Office, Office of Student Affairs, and Research Director's Office. For training a minimum of 500 faces will be captured and for evaluation, A number of 30 people from each department and office. After collecting the image, it will trained through facenet classifying model. Proponets will now construct their own neural network classifier where images will be fed for later evaluation.

Fig 7: Image Training System Diagram
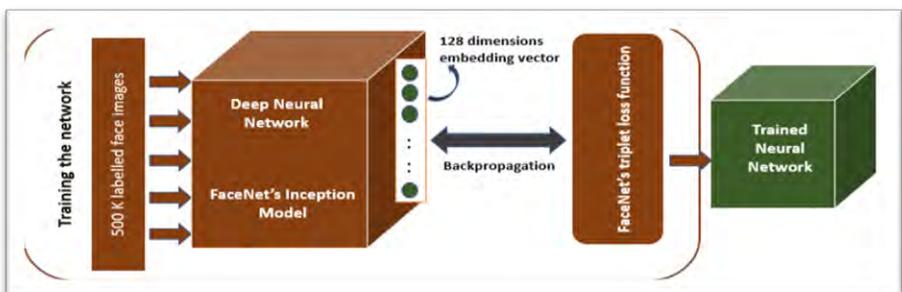
Fig 8: Face Detection Flow Chart
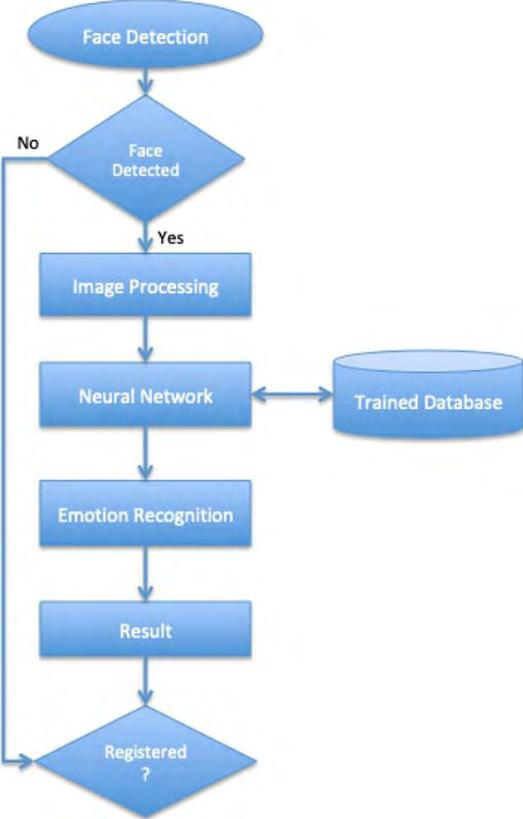
Collected Images for Facial Recognition Training:

Fig 8: Repository for Facial Recognition
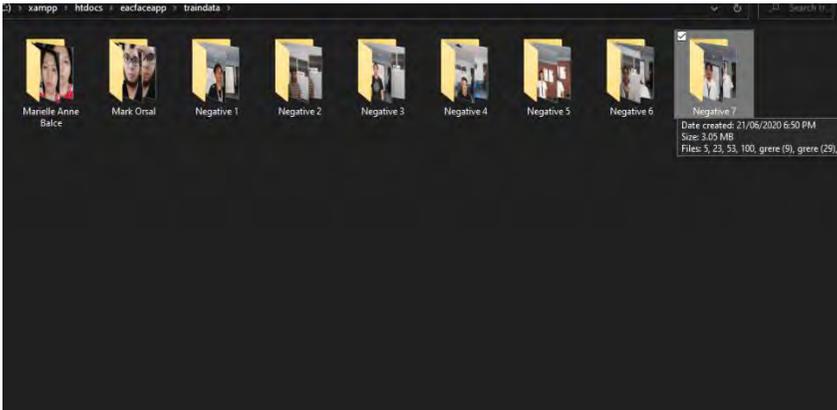
Colleted Images for Emotion Recognition Training

Fig 9: Emotion -Ecstatic

Fig 10: Emotion – Sad

Fig 11: Emotion – Happy

Fig 12: Emotion – Angry

Phase 2.2 : Face Detection

All the collected data was labeled and sorted accordingly. After sorting datasets were fed to the FaceNet classifier, and then transferred to the constructed classifier design for the CSS system. From the whole datasets collected features will be extracted which will classify and differentiate the datasets, all datas will be saved to the server for later registrations.

Fig 13:
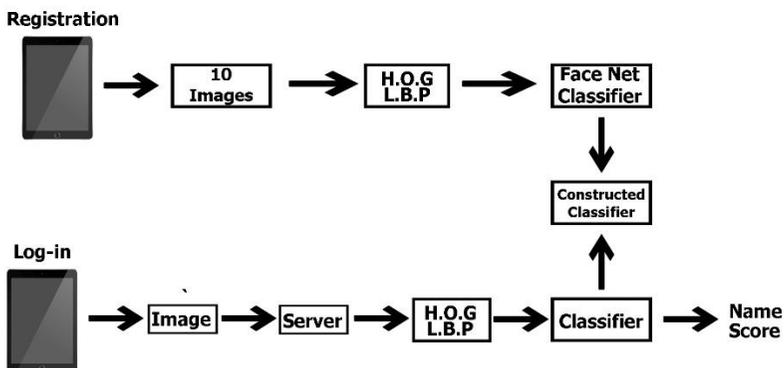
Phase 3: Software Integrations

In this phase the collected images for each expression (Ecstatic, Happy, Sad, Angry) was trained with the use of HOG and LBP classifiers. After training it was sent to the server for futher evaluations. The digitalized version of the Customer Satisfaction Survey was developed through the implementation JavaScript and AndriodStudio which its content was based on Emilio Aguinaldo College's own CSS form.   Lastly, the developed Customer Satisfaction Survey mobile app was integrated to the other system.
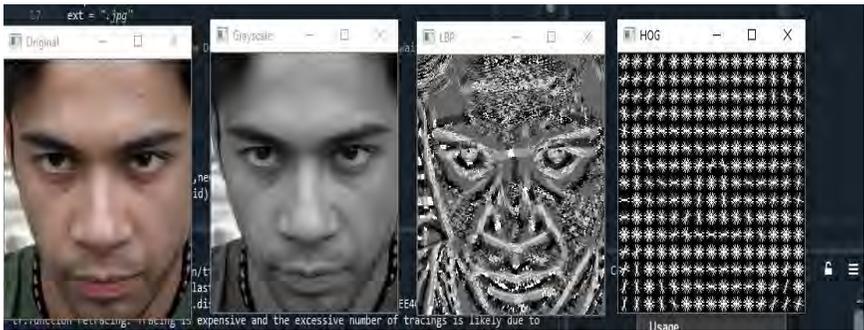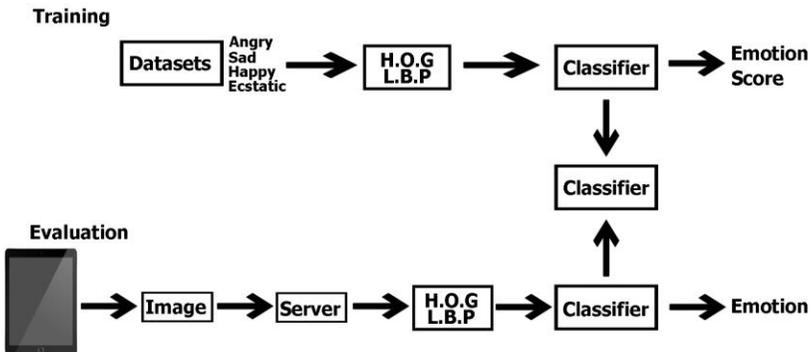
The image above demonstrates how LBP and HOG classifiers shows the outline of the faces while doing each emotions. The outlines shows the facial pattern of an angry person with a straight face, a lowered eyebrows, non-curving lips.
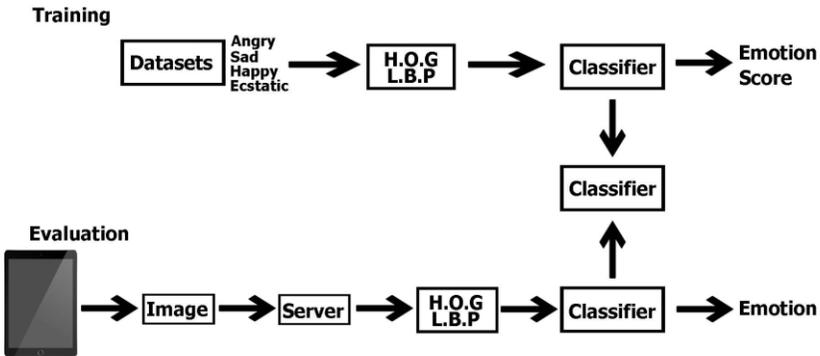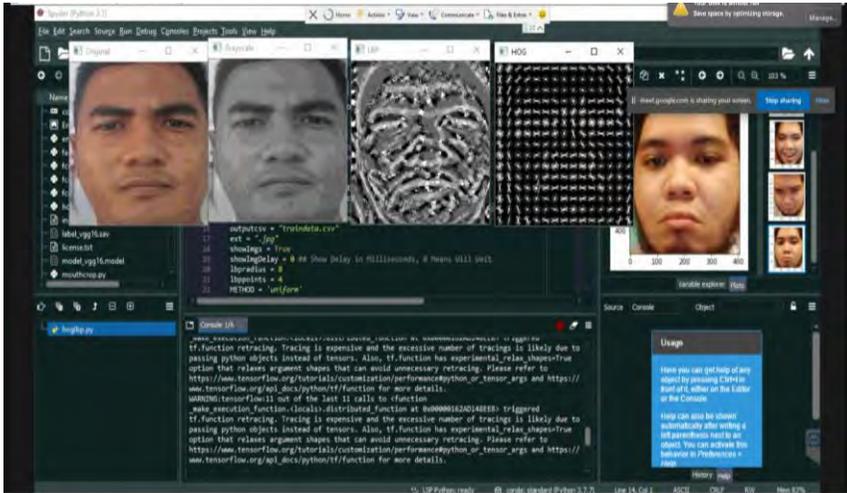
Emotion Recognition once the user is logged in.

Training will take part once all the datasets (Happy, Ecstatic, Sad, Angry) are uploaded. The features will be then extracted by the HOG and LBP and fed in the classifiers which then scores its Emotion recognition confidence level in accordance to a certain threshold. These pre-trained datasets will be saved in the server in preparation for evaluation.

In the CSS mobile application user's image of their facial expression will be send into the server

CSS mobile application:

Log in

Registration

ACCOUNT NAME

DEPARTMENT

PASSWORD

CONFIRM PASSWORD

REGISTER FACE

GO BACK
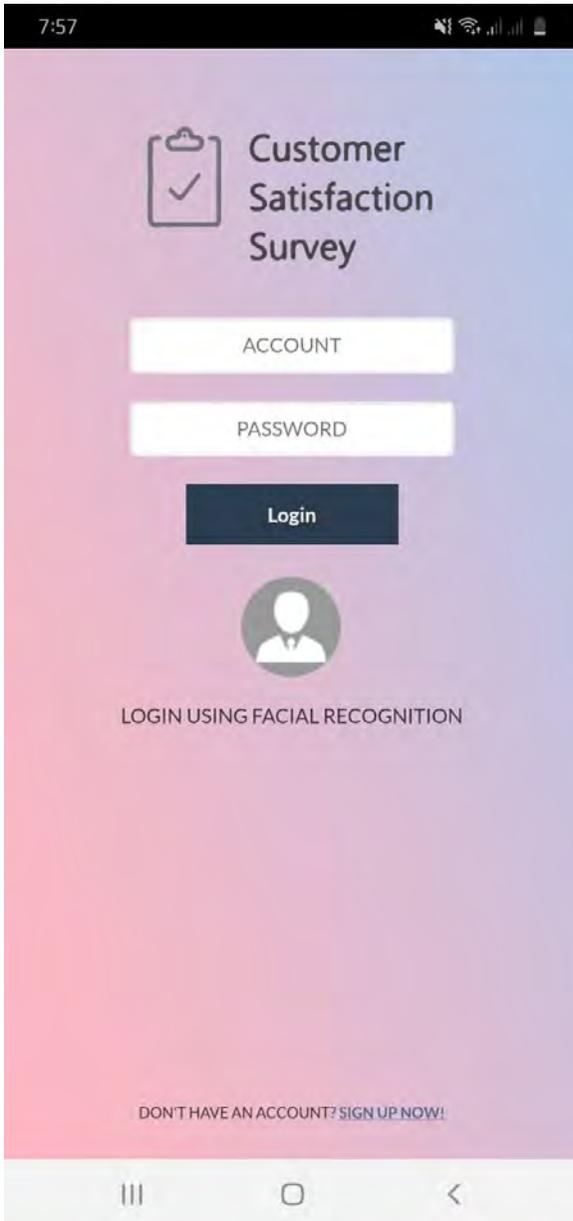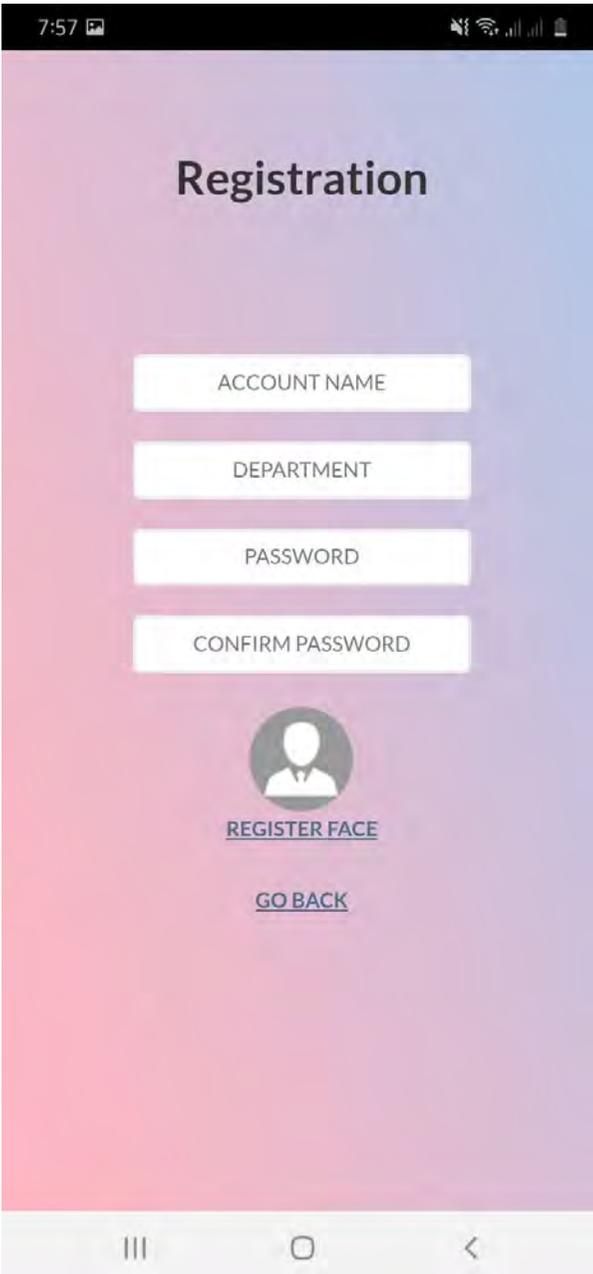
User will be prompt to input account and password or

User can Login using Facial Recognition

User will be prompted to input registration data such as account name, department, password and confirmation.

CSS mobile application: Registration
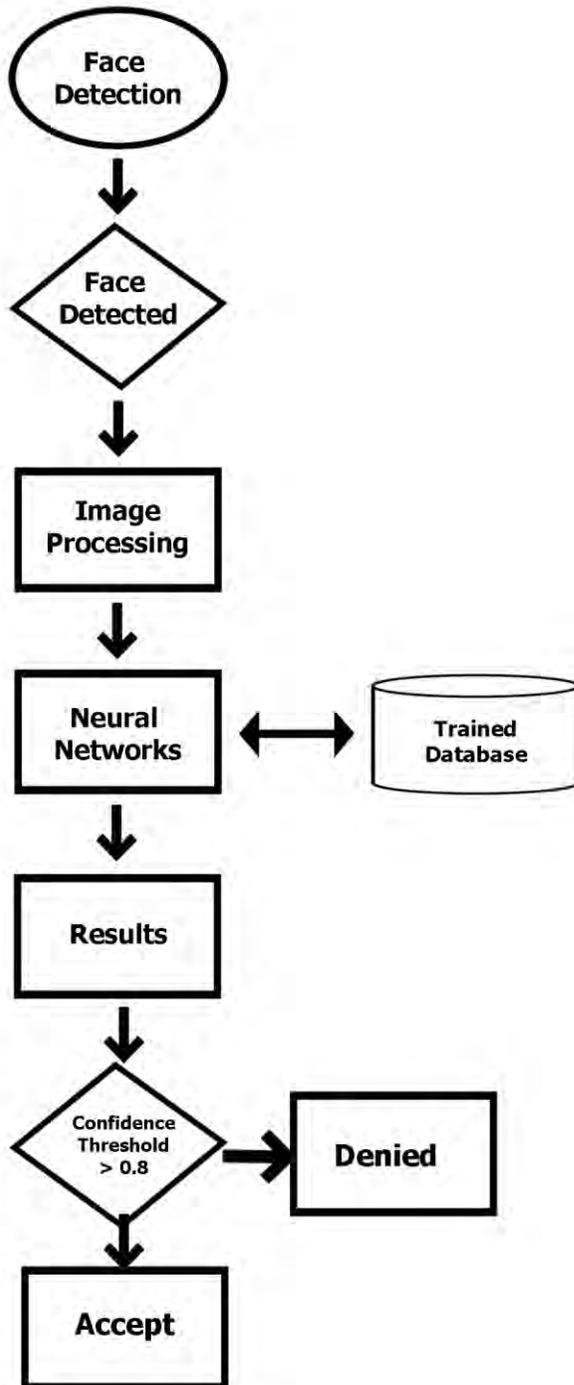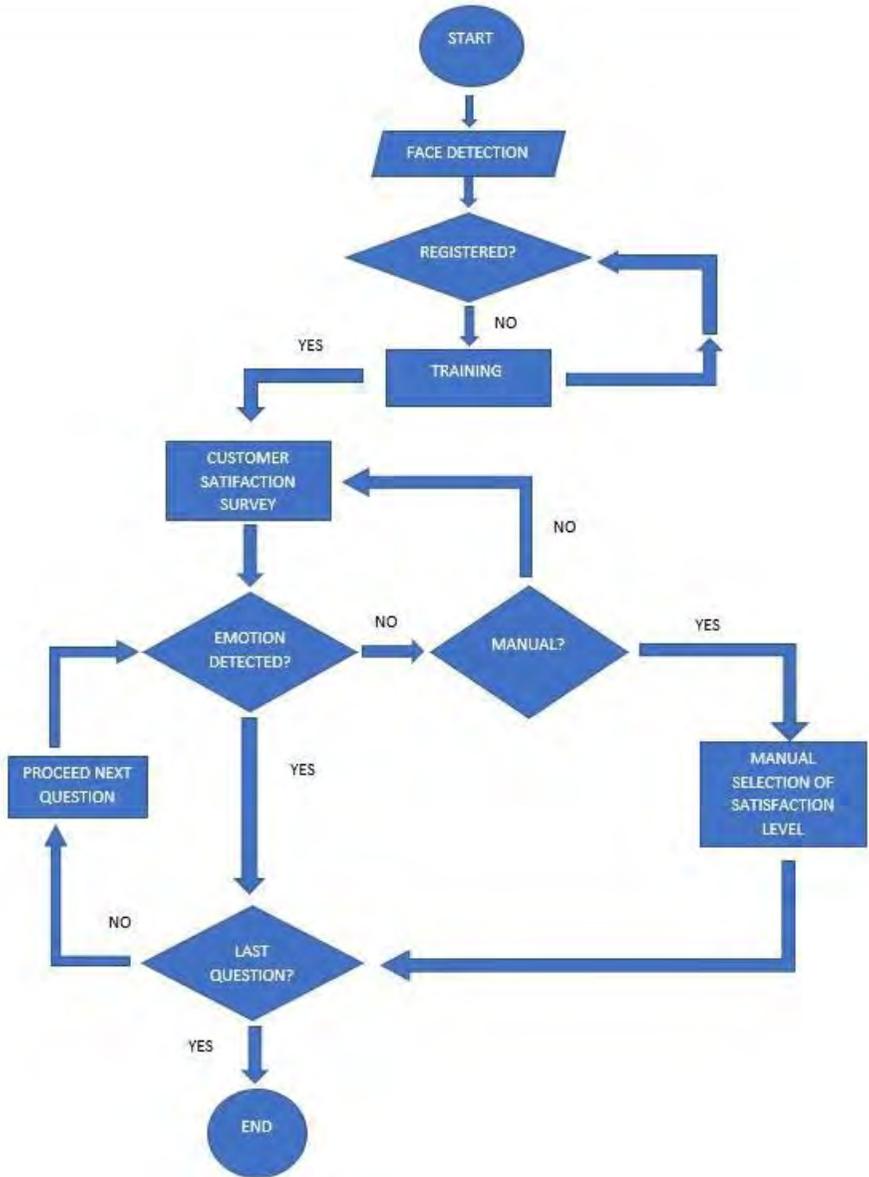
Figure 10: Overall System Flow Chart

Phase 4: Evaluation

In this section the proponents will evaluate the accuracy and reel time detection and recognition of the system in classifying customer's satisfactory level. A total of 180 respondents that will be participating to test the prototype. This will also evaluate the efficiency of implementing Automated Customer Satisfaction Survey on the selected departments and offices of Emilio Aguinaldo College.

Research Locale

The experimentation of the prototype system of this study is to be held exclusively in three college departments and three institutional offices on the campus of Emilio Aguinaldo College Cavite.

Emilio Aguinaldo College is a private institution which was visualized by Dr. Paulo C. Campos (1921-2007) as a training ground for arts, science, and technology for the youth in the Philippines. In 1957 the Marian School of Midwifery which was the predecessor of Emilio Aguinaldo College was established. In September 1977 the Marian College was renamed as General Emilio Aguinaldo College now known as Emilio Aguinaldo College in accordance to the government's guidance in acknowledging and appreciating the national heroes.

With the philosophy of being an institution that upholds indistinguishable and upright opportunities in learning, comprehensive growth of an individual, and enhancing one's nationalism whilst being aware of their role in the international community. Emilio Aguinaldo College believes that the institution can prime an individual that has an excellent character and globally competitive. Being an institution that was established with the culture and traditions of the Philippines, Emilio Aguinaldo College visualizes itself as an institute that steadily pursues the improvement and well-being of humanity. The mission of this academic institution is to yield a student focused, inquiry-based, and socially compatible academe.

Research Participants

The respondents selected are students from three different programs that are enrolled in Emilio Aguinaldo College and three different institutional offices.The respondents were chosen with the criteria of the populational value that they can provide to the researchers for the data sets that are needed to train the system. The researchers will set 30 as the minimum number of respondents for each of the three different programs and three different offices of the institution.

Sampling Techniques

With a set number of respondents, the researchers will utilize a sampling method which is called Quota Sampling. This type of sampling technique is a non-probability type of sampling which enables a proportionality on the population of the respondents. The researchers selected this type of non-probability sampling over other non-probability sampling is because it is easier to implement, efficient in time and cost, and the population to be tested will be proportional to each other.

Data Gathering
The traditional way of gathering the Customer Satisfaction Survey in Emilio Aguinaldo College Cavite is the Research and Development Office (RDO) sets a certain quota per month on how many survey forms should be answered. A week before the start of every month, the Research and Development Office will collect the surveys from each of the colleges and offices in the institution. The RDO will then analyze each of the surveys manually.

The proposed system will utilize the Customer Satisfaction Survey of Emilio Aguinaldo College to collect the frontal face images of the respondents. The images are processed by an algorithm that will detect the action units on the respondents face, the algorithm will then classify the emotional sentiment of the respondent and then send the results of the survey to the database.
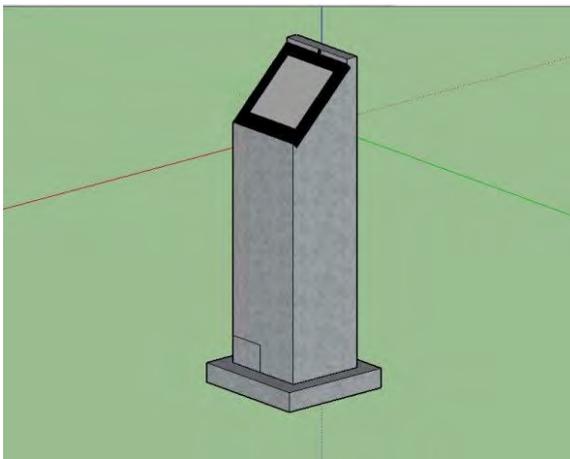

Figure 11: Proposed Prototype Server Design 1 (Isometric Profile)
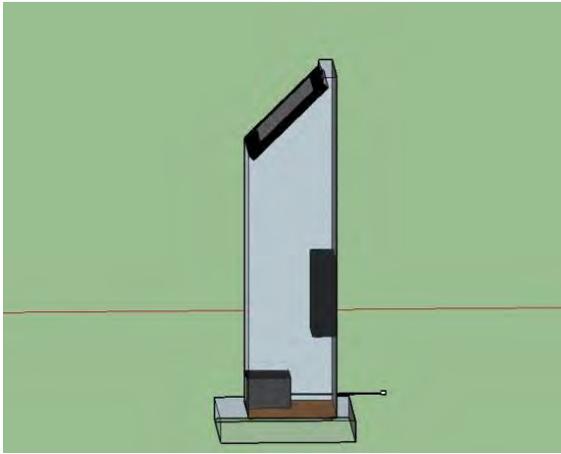
Figure 11.1: Proposed Prototype Server Design 1 (Side Profile)
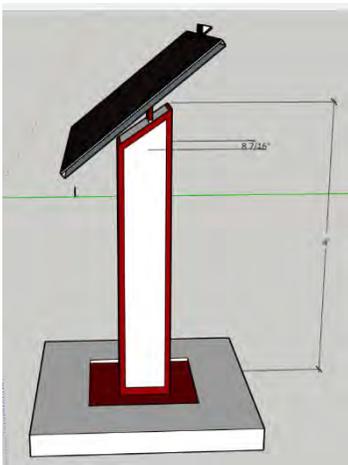
Figure 12: Proposed Prototype Server Design 2 (Side Profile)

Figure 12.1: Proposed Prototype Server Design 2 (Front Profile)

Research Instrument

The Customer Satisfaction Survey (CSS) that Emilio Aguinaldo College implements on each of departmental colleges and institutional offices will be utilized by the researchers as their basis for their research instrument. The CSS from the institution is comprised of a likert scale that ranges from 1 to 4. 1 being not satisfied, 2 being somewhat satisfied, 3 being satisfied, and 4 being very satisfied. The prototype system that will be constructed by the researchers will use a similar approach on identifying the satisfactory level of a respondent. The test questions from the traditional CSS from Emilio Aguinaldo College will be utilized and the likert scale will have small modification, 1 being very unsatisfied, 2 being unsatisfied, 3 being satisfied, and 4 being very satisfied. The prototype system will show an equivalent emoji that corresponds to the facial response of the respondents. 1 shows an Angry emoji, 2 shows a Sad emoji, 3 shows a Smiling emoji, and 4 shows an Ecstatic emoji.

Data Analysis

The researchers will use a statistical treatment that is best used for this type of study and a conventional method for evaluating classifications in the field of machine learnings. Confusion matrix will be used as the statistical treatment for this study.

A Confusion matrix evaluates the performance of a machine learning classifer on a data set which the true values are known.

Lifted from RDO's Report in the Academic Council Meeting on November 19, 2019.

Point: Customer Satisfaction Survey Results and Instrument's Reliability Check for the AY2019-2020

Objective: To validate the CSS Instrument's reliability using the gathered data in the past three months; August, September, and October of 2019.

Month	Number of Respondents			MEAN	
	ACADEMIC SERVICES	NON-ACADEMIC SERVICES	TOTAL	ACD / NAC's Mean	Average Mean
August 2019	467	610	1,077	3.775 / 3.886	3.831
September 2019	544	690	1,234	3.780 / 3.853	3.817
October 2019	666	922	1,588	3.603 / 3.592	3.598
Total	1,677	2,222	3,899	3.719 / 3.777	3.748

CSS Instrument Reliability Check

Using SPSS:

Figure 13: Data Analysis from CSS in EAC Cavite

RESULTS

This chapter shows the results for the Automated Customer Satisfaction Survey system. In this chapter the training phase results and evaluation phase results will be shown. The results for the data gathered are computed with the use of Confusion matrices.

Facial Recognition Training Results


```
 success><success>Classifier Evaluation:
 ssessment against 25.00 % Validation Data: 100.00 %
 onfusion Matrix:
 [3 0 0 0 0 0 0 0]
 [0 4 0 0 0 0 0 0]
 [0 0 3 0 0 0 0 0]
 [0 0 0 4 0 0 0 0]
 [0 0 0 0 2 0 0 0]
 [0 0 0 0 0 1 0 0]
 [0 0 0 0 0 0 4 0]
 [0 0 0 0 0 0 0 2]]
 'Mark Orsal' 'Negative 1' 'Negative 2' 'Negative 3' 'Negative 4'
 'Negative 5' 'Negative 6' 'Negative 7']
             precision    recall  f1-score    support

          0      1.00       1.00      1.00          3
```

This shows that the system recognized the 10 captured images and showed a validation rate of 100%


```
---------------- ANN OFFICIAL TESTING START -----------------
Loading Model...
Loading Test Dataset...
Applying Scaler...
Classifier Testing:
Assessment against 25.00 % Official Testing Data: 71.43 %
Confusion Matrix:
[[22  0  1  3]
 [ 2 30  7  2]
 [ 1  7 27  3]
 [ 7  0  5 16]]
['Angry' 'Ecstatic' 'Happy' 'Sad']
             precision    recall  f1-score    support

          0      0.69       0.85      0.76         26
          1      0.81       0.73      0.77         41
          2      0.68       0.71      0.69         38
          3      0.67       0.57      0.62         28

   accuracy                           0.71        133
  macro avg      0.71       0.71      0.71        133
weighted avg     0.72       0.71      0.71        133

---------------- ANN OFFICIAL TESTING END -----------------
```

Facial Emotion Recognition Training Results
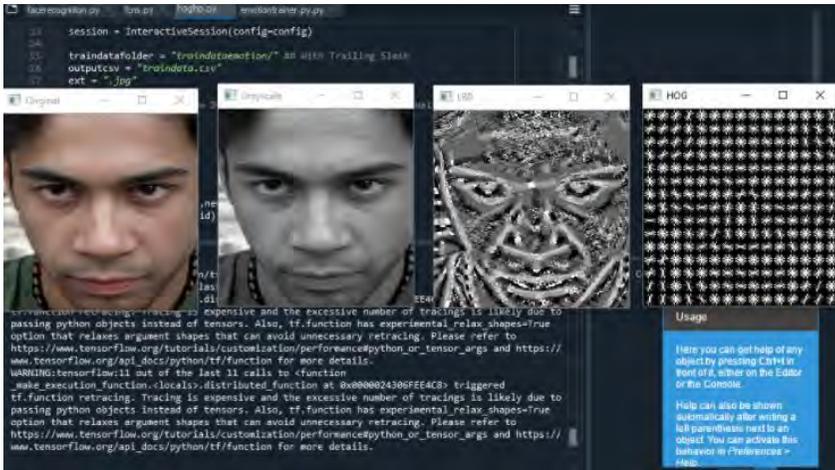
Facial Emotion Recognition Training using
HOG and LBP
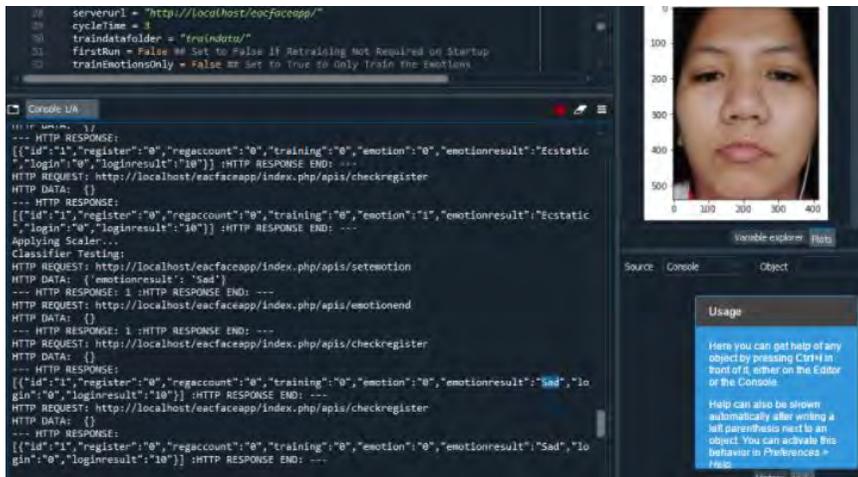
The system shows that it detected a "sad" facial emotion which is what the respondent wanted to express.
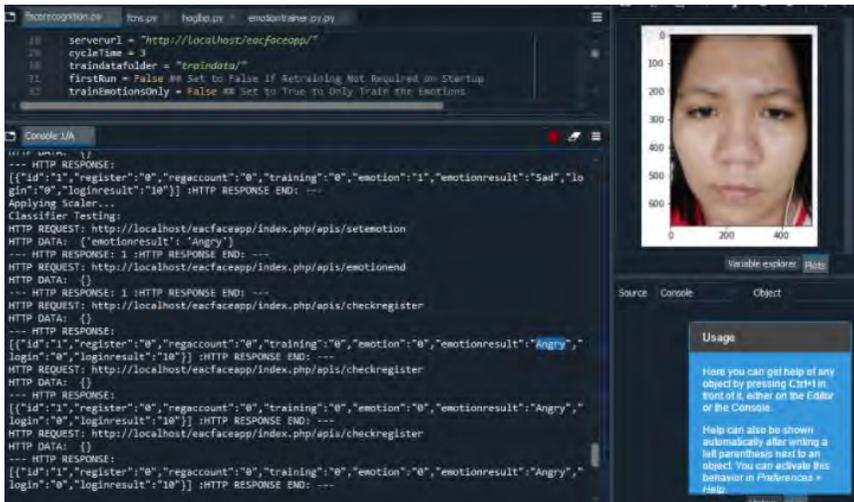
Angry Facial Emotion Detected

This showed an "angry" facial emotion which the respondent wanted to express.
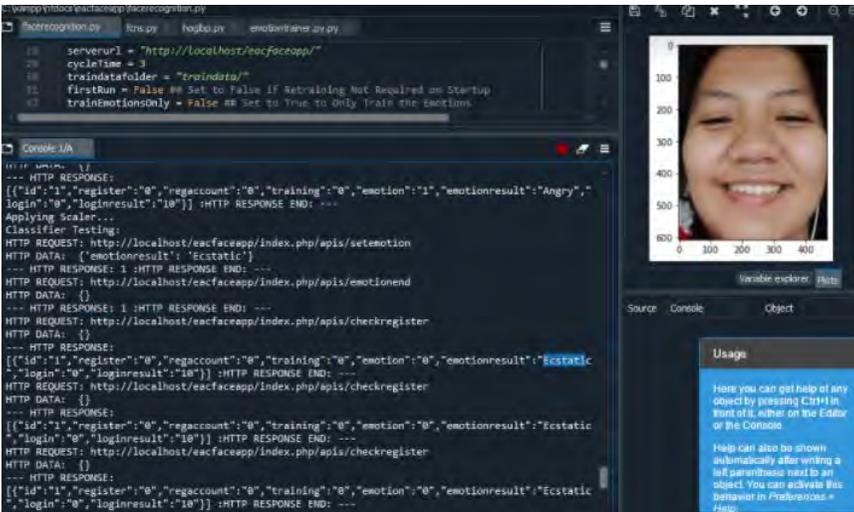
Ecstatic Facial Emotion Detected

This showed an "ecstatic" facial emotion which what the respondent wanted to express.
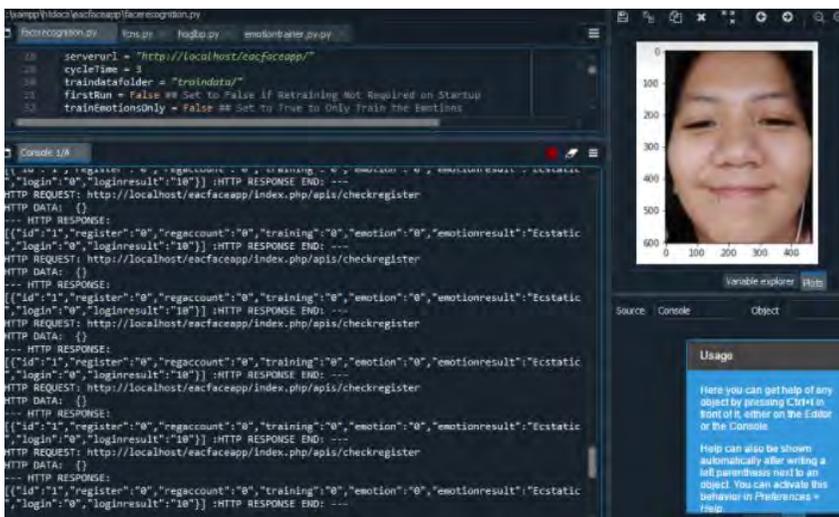
Ecstatic Facial Emotion Detected

This showed an "Ecstatic" facial emotion eventhough the respondent wanted to show a "Happy" facial emotion.
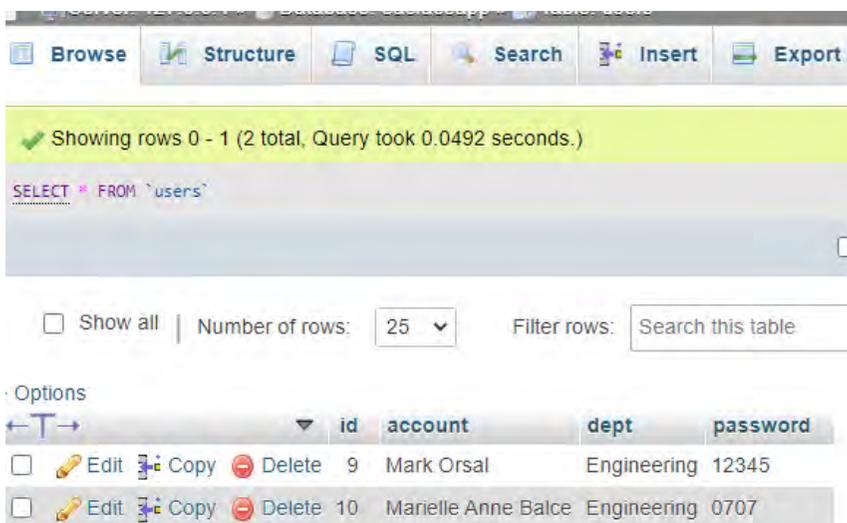
Database for authentication

This database shows the credentials of the registered users.

☐	🖉 Edit ≥ⅈ Copy ⊝ Delete	39	Marielle Anne Balce	Angry	2020-06-22 16:33:25	Handles transaction courteously.
☐	🖉 Edit ≥ⅈ Copy ⊝ Delete	40	Marielle Anne Balce	Happy	2020-06-22 16:33:45	Delivers prompt service on the request or inquiry.
☐	🖉 Edit ≥ⅈ Copy ⊝ Delete	41	Marielle Anne Balce	Ecstatic	2020-06-22 16:34:17	Communicates well by providing clear directions or...
☐	🖉 Edit ≥ⅈ Copy ⊝ Delete	42	Marielle Anne Balce	Sad	2020-06-22 16:34:41	Gives the right response to the request or inquiry...
☐	🖉 Edit ≥ⅈ Copy ⊝ Delete	43	Marielle Anne Balce	Angry	2020-06-22 16:35:05	Handles transaction courteously.
☐	🖉 Edit ≥ⅈ Copy ⊝ Delete	44	Marielle Anne Balce	Sad	2020-06-22 17:38:09	Gives the right response to the request or inquiry...
☐	🖉 Edit ≥ⅈ Copy ⊝ Delete	45	Marielle Anne Balce	Happy	2020-06-22 17:38:43	Delivers prompt service on the request or inquiry.
☐	🖉 Edit ≥ⅈ Copy ⊝ Delete	46	Marielle Anne Balce	Sad	2020-06-22 17:39:05	Gives the right response to the request or inquiry...
☐	🖉 Edit ≥ⅈ Copy ⊝ Delete	47	Marielle Anne Balce	Angry	2020-06-22 17:39:27	Handles transaction courteously.
☐	🖉 Edit ≥ⅈ Copy ⊝ Delete	48	Marielle Anne Balce	Ecstatic	2020-06-22 17:39:47	Communicates well by providing clear directions or...

Database for the responses

This database shows the results of the surveys conducted.

These results can be exported as an excel file.

DISCUSSION

Interpretation of results:

Due to the occurring Covid-19 pandemic proponents was not able to conduct surveys and proper evaluation of the prototype with 30 respondents.

Conclusion:

The researchers were able to design an Automated Customer Satisfaction Survey Using Facial Recogniton applying deep learning with the implementation of FaceNet, Histogram Oriented Gradients (HOG) and Local Binary Pattern (LBP) as its primary classifiers.

FaceNet being one of the most utilized deep classifying model that can accurately recognize faces at 0.99 confidence level (99.0%), on the other hand researchers was not able to use FaceNet for Emotion Recognition due to its condition where emotion features are being disregarded thus still being able to recognized the face of the person. Leaving an accuracy ranging from 30%-45%. The researchers then switch to VGG model, which gave a higher accuracy, but using VGG the system classified only 3 emotions which are Ecstatic, Happy and Sad, disregarding Angry.

These circumstances led the researchers to look back at a more traditional, old school facial recognition models which are Histogram Oriented Gradients (HOG) and Local Binary Patter (LBP).

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The system was able to recognize a person face with the confidence level of 0.8 above ranging from 0-1, 0 being the lowest and 1 being the highest, which can also be represented as percentage. As for the emotion recognition the system was able to classify with the accuracy of 65%-71.4% confidence rate. The system reached a minimum accuracy of 65% despite having an average numbers of datasets (700+ images) trained for emotion recognition while on the face recognition the system gave an accuracy of 99% to 100%. The researchers concluded that the system will gain accuracy once provided an above average number of datasets with various and more distint facial features. This also concludes the effectiveness of the implementation of both HOG and LBP as its classifier into the system that gave a more clearer and broad extraction of the features need for classification.

Recommendation:

While doing this research, the researchers had a lot of technical difficulties which results to numerous alteration of the systems.

After thoroughly analyzing the data, the following recommendations for the future researchers are:

(1) Using only FaceNet model to recognize and classify emotion is not recommended due to Facenet often fails to recognize the facial emotion features accurately.
(2) The next researchers can add other factors to highly improve the accuracy of distinction from one face to another, emotion to another.
(3) For more security purposes, the next researchers are suggested to integrate a stereographical camera to detect the field of depth which is lacking on 2D facial recognition.

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Diagnostic Utilization of Urine 1,5 – Anhydroglucitol as a Non-Invasive Predictor of Serum 1,5 – Anhyrdroglucitol in Diagnosis of Type II Diabetes Mellitus using Enzyme Linked Immunosorbent Assay (ELISA)

Charles Andrew S. Vasquez, Melyn L. Besana, Alex Nicole G. Bolanos, Kristal Claire D. Guevarra, Ma. Kathrina Ballentos, Pamela Rose Bremner and Dr. Supachai Basit

School of Medical Technology

Abstract. 1,5- Anhydroglucitol (1,5-AG), a naturally occurring polyol, is a stable biomarker that detects the hyperglycemic excursions of diabetic patients (Welter, et al., 2018). Diagnosis of type 2 diabetes mellitus is based on the measurement of the concentration of 1,5-AG in the blood (serum 1,5-AG). A significantly lower concentration of serum 1,5-AG is seen in diabetic patients versus normal and healthy individuals (Hess and Strattman, 2012) . Current methods of screening involve an invasive method through extraction of blood sample. In this experiment, concentration of 1,5-AG in urine (urine 1,5-AG) is explored as a proxy for serum 1,5-AG. This is valuable in order to conduct non-invasive diagnostic tests for type 2 diabetes mellitus. Urine and blood samples from 44 individuals were gathered for this research. Half of the group is comprised of individuals diagnosed with type 2 diabetes mellitus, while the other half is composed of individuals who have not been pre-diagnosed with type 2 diabetes mellitus to be used as control. The blood and urine samples obtained were analyzed for 1,5-AG concentration using an ELISA microplate reader with a wavelength of 450 nm. Simple linear regression was used to determine correlation. From the results, urine 1,5-AG showed positive correlation with serum 1,5-AG in diabetic patients. The test is found to be a useful tool for diagnosis upon testing the ROC curve validating the accuracy, sensitivity, and specifictty of the analyte. The study suggests that urine 1,5-AG may be a non-invasive predictor of serum 1,5-AG in diagnosis of type II diabetes mellitus.

INTRODUCTION

Background of the Study

In the past 20 years, the high prevalence of diabetes mellitus has proven to be worldwide health problem. Up to 90% of the cases of diabetes are classified as Type II diabetes (Bennett, Guo, & Dharmage, 2006). The fast pace of economic progress and improvement of social standards brought about more sedentary lifestyles and less healthy food choices, which increase the incidence of diabetes every year (Ma C. , Sheng, Liu, & Guo, 2017). According to World Health Organization (WHO), Diabetes is a chronic, progressive disease characterized by increased levels of blood glucose which can further continue to complications such as cardiovascular disease and premature death. Early diagnosis of the condition is important as careful diabetes management can reduce long-term complications such as blindness, kidney failure, and limb amputation. Around the world, many adults are suffering from diabetes mellitus, resulting to death of 1.6 million people in 2015 and 12.8% of the whole death rate in 2017. (WHO, 2018).

In the recent years, HbA1C is considered as the gold standard in screening and monitoring cases of diabetes and is a useful tool in preventing diabetic complications and educating patients in the clinical setting (Ha, Byung, Jae, Kyo, & Sochung, 2015). HbA1c reflects glycaemia on average over the past 2-3 months (Dabrowska, Tarach, & Kurowska, 2012).

However, HbA1c reflects only the average glucose levels, potentially missing important hyperglycemic excursions that may be balanced out by hypoglycemia. In addition, some researches find conditions where HbA1c yields false results. Among the conditions that give falsely high results in HbA1C include iron deficiency, anemia, and hemoglobinopathies. On the other hand, conditions such as hemolysis, reticulocytosis, post-hemorrhage or post-transfusion, uremia, splenomegaly; and drugs such as iron, erythropoietin, and dapsone, tend to give a falsely low result (Wright & Hirsh, 2012). Therefore, an alternative marker that robustly reflects postprandial glucose excursions would be useful in the diagnosis and management of patients with diabetes (Dungan, Buse, & Largay, 2006).

One alternative biomarker is 1, 5- Anhydroglucitol (1,5-AG), which is a major compound in human serum structurally similar to D-glucose. The 1,5-AG pool can be determined by the balance between oral intake and urinary excretion (Dabrowska, Tarach, & Kurowska, 2012). The short-term glycemic control monitoring using 1,5-AG levels was introduced into clinical practice in Japan and was established worldwide in 1996. Measurements of 1, 5-Anhydroglucitol reflects the glycemic status of the previous 48 hours to 2 weeks. It is well known that serum 1, 5-Anhydroglucitol is a useful clinical marker of both short-term glycemic status and postprandial hyperglycemia (Halama A. , et al., 2016). Some researchers argued that this test would be clinically useful to monitor short-term changes in glycaemia, such as preoperative pre-conception, pregnancy and therapeutic changes related to glycaemia. 1,5-AG is a useful index in patients with relatively well-controlled diabetes, and it is suggested that 1,5-AG may be a complementary tool for HbA1c in patients with moderately controlled type 2 diabetes (Dabrowska, Tarach, & Kurowska, 2012).

Statement of the Problem

The main objective of the study is to determine the diagnostic utilization of urine 1,5-Anhydroglucitol (AG) for patients with Type II diabetes mellitus. The following are the specific objectives of the study:
1. What is the difference between urine 1,5-Anhydroglucitol (AG) levels of patient with Type II diabetes mellitus and normal patients?
2. What is the difference between the values of urine and serum 1-5 Anhydroglucitol (AG) of patients with type II diabetes mellitus?
3. Can Urine 1,5-Anhydroglucitol (AG) be a predictor of Serum 1,5-Anhydroglucitol (AG)?
4. What is the diagnostic capability of 1,5– Anhydroglucitol (AG) in urine?
Conceptual Framework

Figure 1. Conceptual model of the study.

1 • EXTRACTION AND COLLECTION OF BLOOD AND URINE SAMPLES TO MEASURE THE 1,5-ANHYDROGLUCITOL LEVELS.

2 • COMPARISON AND CORRELATION BETWEEN URINE AND SERUM 1,5 AG WITH THE UTILIZATION OF LYCOMARK KIT.

3 • URINE 1,5 – AG IS AN ALTERNATIVE AND A NON-INVASIVE BIOMARKER FOR HYPERGLYCEMIA.
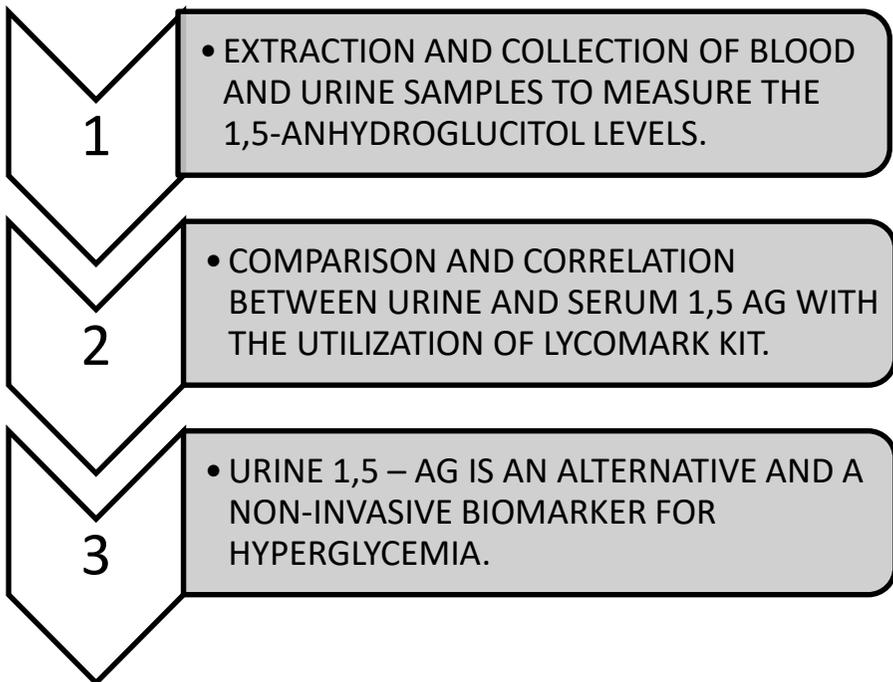
The whole research revolves around figure 1 with 1,5 – Anhdryoglucitol levels in serum and urine. Both serum and urine will be collected in participants of the research to compare and correlate the results of 1,5-AG.

Serum samples will be collected in the participants and will be processed using Lycomark which utilizes the principle of ELISA that specifically is a competitive inhibition enzyme immunoassay technique for the in vitro quantitative measurement of plasma, serum, and other body fluids. Same procedure will be applied using the urine sample.

The gathered values of both serum and urine 1,5-Anhydroglucitol will be compared and correlated with each other to build a conclusion that the same analyte from different sample is a prospective biomarker in diagnosis of type II DM.

Since the measurement of Serum 1,5-AG is now commercially available, this research tries to prove that urine can be a potential non-invasive biomarker of glycemic excursions in diagnosis of type II DM.

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Research Hypothesis

The following are **<u>negative hypothesis</u>** of the study:
1. There is no significant value from samples of type II diabetes mellitus patients and normal control samples.
2. There is no significant value from urine and serum 1,5-Anhydroglucitol of patients with type II diabetes mellitus.
3. Urine 1,5-Anhydroglucitol values cannot predict the values of Serum 1,5-Anhydroglucitol. Thus, it cannot be a diagnostic tool for Type II Diabetes Mellitus
4. Urine cannot predict the values of serum 1,5-Anhydroglucitol.
The following are **<u>positive hypothesis</u>** of the study:
1. There is a significant value from samples of type 2 diabetes mellitus patients and normal control samples.
2. There is a significant value from urine and serum 1,5-Anhydroglucitol of patients with type II diabetes mellitus.
3. Urine 1,5-Anhydroglucitol values can predict the values of Serum 1,5-Anhydroglucitol. Thus, it can be a diagnostic tool for Type II Diabetes Mellitus
4. Urine can predict the values of serum 1,5-Anhydroglucitol.

Scope and Limitation

The study aims to correlate urine 1,5-AG to serum 1,5-AG for possible diagnosis of type II diabetes mellitus. A normal urine and serum 1,5-AG must be obtained from the respondents in order to present a normal indicative value of 1,5-AG from the healthy patients. Likewise, a sample of urine and serum must be obtained from a diagnosed and verified diabetic patient in order to present the abnormal levels of 1,5-AG in the respective body fluids.

The values acquired from the two different groups of respondents will be compared to reflect the difference between the abnormal values 1,5-AG from the normal values of 1,5-AG.

In order to correlate values from urine 1,5-AG to serum 1,5-AG, a graph reflecting the values from both variables will be shown to see the difference or the possible relationship between the two samples.

On the contrary, the study will not diagnose a respondent based on this study alone. Proper diagnosis must still follow the current protocol followed by the Department of Health, and by the actual diagnosis of a licensed physician.

Significance of the Study

The following are the stakeholders who would benefit from this study:

A. Researchers

This research will aid in developing future studies to provide valuable information about diseases such as type II diabetes mellitus. This will also help us, researchers to be aware and knowledgeable of the process involved, it can help us as a future reference for more studies in the future generation.

B. Patient

Patients are typically citizens. They receive care and services from different hospitals, institute and community. This research aims to evaluate the diagnosis of type II diabetes mellitus by using 1, 5-Anhydroglucitol as biomarker which will provide information and offer an alternative solution with respect to this study.

C. Medical Profession

In health care industry, this study will improve the knowledge in diagnosing diseases such as type II diabetes mellitus with the use 1, 5-Anhydroglucitol. They provide broader preventive care to at risk populations and they bring about other change to improve health care delivery to the patients.

Definition of Terms

1, 5-Ahydroglucitol - is an alternative biomarker that can be determined between oral intake and urinary excretion by using automated assay.

Biomarker – refers to measurable substance and valuable indicators of exposure and effect in disease state.

Diabetes Mellitus – group of disease in which blood glucose levels are elevated over a prolonged period of time.

ELISA – Enzyme Linked Immuno-Sorbent Assay also called as solid-phase enzyme immunoassay, is a very sensitive immunochemical technique which is used to access the presence of specific protein in the given sample and its quantification.

Fructosamine – is a glycated protein that is similar to Hb1Ac the amount of fructosamine is serum is increased in diabetes mellitus owing to the abnormally high concentration of sugar in blood.

HbA1c – the gold standard for monitoring patients with diabetes and preferred test to use to assess glycaemic control.

Review of Related Literature

WORLDWIDE CASE OF DIABETES MELLITUS

World Health Organization defines Type II Diabetes Mellitus as a chronic disease in response to the inability of the pancreas to produce insulin or by the ineffectiveness of insulin to function in the system. Type II Diabetes Mellitus, formerly known as non-insulin-dependent diabetes, is a result of the body's inability to respond properly to the action of insulin produced by the pancreas.

Due to the population growth, aging, urbanization, and increasing prevalence of obesity and physical inactivity, the number of people diagnosed with diabetes continues to grow rapidly across the globe. Over the past three decades, the alarming growth of cases of diabetes mellitus has made this disease as one of the largest public health issues to all nations across the world (WHO,2014). In addition to the early onset of Type II Diabtes Mellitus in young adults, an increasing trend of Type II Diabtes Mellitus and prediabetes is noticeable among children and adolescents (Chen, Magliano, & Zimmet, 2011).

On a study that estimates the global prevalence of diabetes, it is said that the total number of people with diabetes is projected to rise from 171 million in 2000 to 366 million in 2030 making it a real public health issue both today and in the future (Wild, Roglic, Green, & Sicree, 2004). In the last 2016 summary of the leading causes of death in the American population conducted by Centers for Disease Control and Prevention, Diabetes was ranked seventh leading cause of death with 80,058 recorded mortality rates in the data (CDC, 2018).

LOCAL CASE OF DIABETES MELLITUS

Diabetes is a chronic disease characterized by high blood sugar levels due to inadequate insulin production. Diabetes is considered one of the leading causes of end stage renal disease in which if left uncontrolled it may lead to dialysis, cardiovascular disease, blindness and amputations (Jimeno & Kho, 2015). Diabetes is rapidly increasing worldwide and causes a major impact in third-world countries especially in the Philippines. As in other low- and middle-income countries because the availability and affordability of care and medicines are crucial to control diabetes which is to be known as Type I and Type II Diabetes Mellitus

(Huguchi, 2010). Burden of disease studies are important in order to be able to assess the diseases trends and patterns, thus shedding light on the approaches to its prevention and treatment (Jimeno & Kho, 2015). International Diabetes Federation stated that there are over 3,721,900 cases of diabetes in the Philippines in 2017. According to Department of Health in 2017, Diabetes was the 6th leading cause of death among Filipinos based on the data from Philippine Health Statistics in 2013.

Type 2 Diabetes Mellitusis the most common type of diabetes in the Philippines. In 2009, a cohort study derived from a larger population-based investigation in 1998 was revisited and demonstrated a 9-year incidence rate of Type II Diabetes Mellitus in the Philippines to be around 16.3%. In the latest survey published by the Food and Nutrition Research Institute in the Philippines (the Eighth National Nutrition Survey of 2013), the prevalence of high fasting blood glucose based on the World Health Organization criteria of >125 mg/dL for individuals >20 years old was 5.4%, an increase of 0.6%, compared with the same study in 2008. The highest prevalence rate was found among the richest in the wealth index, those living in urban areas, and those in the 60- to 69-year age group in both sexes. These studies show an alarming growth rate of Type II Diabetes Mellitus in the Philippines commensurate with an upward trend in worldwide prevalence. In the 2014 prevalence estimates published by the International Diabetes Federation, it is estimated that there are 3.2 million cases of Type II Diabetes Mellitus in the Philippines with a 5.9% prevalence rate in adults between the ages of 20 and 79 years. Around 1.7 million people with Type II Diabetes Mellitus remain undiagnosed. The estimated cost per person with Type II Diabetes Mellitus in 2013 in the Philippines is $205, which is comparable with neighboring countries such as Thailand ($285) and Indonesia ($174.7) (Tan, 2015).

HbA1c

The efficient diagnosis and accurate monitoring of diabetic patients are cornerstones for reducing the risk of diabetic complications. Historically, the first method of diagnosing the glucose level of a person is through "Ant testing" and "Taste testing". Years later the detection of glucose level progressed to chemical testing of Frederik Dekker's discovery of albuminuria by boiling urine (Strasinger, 2014).

Currently, HbA1c is considered as the "gold standard" of diabetic survey, a diagnostic procedure that was successfully implemented in clinical procedures in the 1970s and 1980s which was also internationally standardized in the year 1990s and 2000s (Gillery, 2012). It was back in 1976 that Hba1c was considered as the glycemic marker and it was

proven to be that HbA1C reflects the mean blood glucose concentration over previous weeks to months. Thus, it was used extensively as the monitoring procedure for documenting glycemic control up until today (Wright & Hirsh, 2012).

Diagnosis of Type II Diabetes Mellitus follows the criteria made by the American Diabetes Association (ADA) which is a fasting plasma glucose (FPG) level of 126 mg/dL(7.0 mmol/L) or higher (Christensen, Nicolaisen, & Berencsi, 2018). The primary disadvantage of fasting plasma glucose is the eight to twelve hours fasting requirement for a patient prior the testing and its inability to predict long term outcomes for patients with Type II Diabetes Mellitus (Manzella, 2018).

It was only in September 2011 that the New Zealand Society for the Study of Diabetes (NZSSD) shifted its recommendation in choice of test for diagnosing Type II Diabetes Mellitus. NZSSD states that glycated haemoglobin (HbA1C) is more desirable in diagnosing diabetes over fasting plasma glucose and oral glucose tolerance test (BPAC, 2012). The advantage of glycated haemoglobin is that it captures chronic hyperglcyemia better than two assessments of fasting or 2-h oral glucose tolerance test. Other reasons to prefer HbA1C compared with plasma glucose determination for diagnosing diabetes include, No acute perturbations (e.g., stress, diet, exercise, smoking) affect HbA1C which compared to FPG will cause glucose metabolism and lead to hyperglycemia in diabetes mellitus. Also, HbA1C has a greater pre-analytical stability than blood glucose (Bonora & Tuomilehto, 2011)

However, there are certain cases where measuring HbA1C for diagnosis of Type II Diabetes Mellitus may be inaccurate and potentially give a misleading result (BPAC, 2012). The main concern with HbA1C is its inability to predict short term episodes of glucose excursion making it less sensitive to diagnosis (Dabrowska, Tarach, & Kurowska, 2012). High glycated haemoglobin indicates high glycations of protein in the body which basically is different to the definition of diabetes a clinical condition of elevated glucose concentration in blood. Although high glycation of protein is secondary to blood glucose if this parameter is considered the primary tool, it will lead to a major change in the pathophysiological paradigm because most importantly in Medicine it is important to pay attention to the primary phenomena before leading to the secondary ones (Bonora & Tuomilehto, 2011).

Aside from that HbA1c has several limitations, such as genetic variants, elevated fetal haemoglobin, chemically modified derivatives of haemoglobin, iron defieciencyanemia, iron replacement therapy, chronic

renal failure and several drugs can also affect HbA1c levels (Wright and Hirsh, 2012)

FRUCTOSAMINE

Fructosamine, discovered about 30 years ago, is a marker of glucose control reflecting the average glycaemic level over the preceding 2–3 weeks. It is quick, technically simple, inexpensive, precise, fairly free of interferences, unaffected by red blood cell diseases and easily automated for use with microsample volumes (Nanssue, Fokom-Domgue, & Noubiap, 2015). It is a ketoamine formed from the binding of fructose to total serum protein, mostly albumin, through glycosylation. Serum fructosamine values reflect mean blood glucose concentrations over the previous two to three weeks, which can be used clinically as markers of recent changes in glycemic control (Lee, 2015).Fructosamine is a simple, robust and inexpensive biomarker that could potentially be a useful tool in large epidemiological and clinical studies either as a standalone indicator of hyperglycemia or in combination with glucose and HbA1c. Importantly, fructosamine may be reliably measured irrespective of fasting or non-fasting (Malmstrom, et al., 2014). However, there are also several limitations to the use of serum fructosamine measurements. The higher-within subject variation for fructosamine than that for HbA1c means that frequent measurements must be conducted. Serum fructosamine values must be adjusted if the serum albumin concentration is abnormal. Falsely low levels in relation to mean blood glucose levels will occur with rapid albumin turnover, such as in nephrotic syndrome, severe liver disease or protein-losing enteropathy. The level of fructosamine in young children is lower than in adults, which is also partly due to their lower serum protein concentration. (Lee, 2015) Multiple methods have been used to measure fructosamine, including the phenylhydrazine procedure, the furosine procedure, affinity chromatography, the 2-thiobarbituric acid colorimetric procedure, and the nitroblue tetrazolium colorimetric procedure (Kalyani, 2014). In the literature, glycated serum protein (GSP) is also known as Fructosamine. It is traditionally measured by a non-specific chemical method using nitroblue tetrazolium (NBT) that is interfered with by various reducing substances in patients' sample. Although rapid, inexpensive, and available for automation, the method remains poorly standardized. GSP bridges the gap between blood glucose testing (a transient index) and HbA1c testing (a long term index), and provides a complementary and unique system to the existing methods for glycemic control (Borses, 2018).

1, 5- ANHYDROGLUCITOL

In the generation of research and studies, a validated marker of short-term glycemic control was discovered and isolated from Polygaraamara plant by Chodat. It was on 1975 when Pitkänen first reported on the existence of 1, 5-AG in human plasma and cerebrospinal fluid in diabetic patients; at that time first studies showed low levels of 1,5-AG in patients with diabetes (Stickle and Turk, 1997).

This substance is mainly derived from food, well absorbed in the intestine, and distributed to all organs and tissues. It is metabolically stable, excreted in the urine when it exceeds the threshold of the renal. It is reabsorbed in the renal tubules and is competitively inhibited by glucosuria, resulting in its serum level being reduced. The correlation between this reduction and the amount of glucose in urine is so close that 1,5-AG can be used as a sensitive, daily, real-time glycemic control market. In detecting near-normoglycemia, it provides useful information about current glycemic control and is superior to both HbA1c and fructosamine (Yamanouchi T, Tachibana Y, Akanuma H et al, 1994).The decrease in 1,5-AG appears to be due to accelerated urinary excretion of AG during hyperglycemia in parallel with urinary excretion of glucose and is likely due to competition between glucose and AG for tubular reabsorption. For these reasons, monitoring of plasma AG was suggested and/or recommended as a glycemic control marker (Stickle and Turk, 1997).

Most notably, 1,5-AG level is reflective of short-term glucose status, postprandial hyperglycemia, and glycemic variability which are not captured by HbA1c assay. 1,5-AG may suggest an alternative index of subtypes of diabetes and a warning sign of diabetes complications (Kim & Park, 2012). Levels of 1,5-AG recovers within days after restoration of normoglycemia. Because 1,5-AG reflects serum glucose through a different physiological mechanism than HbA1c, it offers a supplementary way to evaluate and compare glycemic control. Levels of 1,5-AG are inversely correlated with glycemia (Herman & Dungan, 2009). In such patients with close-to-goal or optimal HbA1C, 1,5-AG is a powerful predictor of postprandial hyperglycemia because it measures glucose excursions. As such, a lower level of 1,5-AG may be helpful as a complementary tool in the fine-tuning of glucose control (Wright & Hirsh, 2012). The normal 1, 5-AG serum concentration was reported as 12–40 μg / mL. Serum 1,5-AG concentrations are maintained at a constant stable state during euglycemia due to renal tubular reabsorption of all serum 1,5-AG concentrations. Within 24 hours of an increase in serum glucose to >180 mg / dL, as urinary losses increase, serum circulating 1,5-AG falls.

Lower serum 1, 5-AG levels reflect high blood glucose levels and glycosuria occurrence over the past 1 to 2 weeks (Lee, 2015).

Monitoring of blood levels 1,5-AG to assess short - term glycaemic control was introduced more than 20 years ago in clinical practice in Japan and was established worldwide in 1996 (Halama A. , et al., 2016). The 1,5-Anhydroglucitol (1,5-AG) is more accurate in predicting rapid changes in glycemia than hemoglobin A1C or fructosamine. 1,5-Anhydroglucitol is more tightly associated with glucose fluctuations and postprandial glucose (Dungan, Buse, & Largay, 2006).

An automated assay (Glycomark) has recently been approved in the U.S. as a short-term marker for glycemic control, and a similar assay has been in use in Japan for over a decade. During normoglycemia, 1,5-AG is maintained at constant steady-state levels due to a large body pool compared with the amount of intake and due to a lack of metabolism. Normally, in the kidneys, 1,5-AG is filtered and completely reabsorbed. However, with elevated serum glucose concentrations (generally >180 µmol/l, the average renal threshold for glucose), glucose is not completely reabsorbed by the kidney, and serum 1,5-AG falls due to competitive inhibition of renal tubular reabsorption by glucose. The change in 1,5-AG depends on the duration and magnitude of glucosuria, and 1,5-AG recovers at a rate of ~0.3 µg · ml−1 · day−1 when normoglycemia is restored. Measurements of hemoglobin A1C reflect blood glucose levels over the past 2–3 months, while fructosamine can be used for 10–14 days of glycemic control. By contrast, as a result of the competitive inhibition of 1,5-AG reabsorption in the kidney tubule by glucose, blood levels of 1,5-AG respond within 24h (Buse, Freeman, Edelman, Jovanovic, & McGill, 2003). Thus, 1,5-AG responds sensitively and rapidly to changes in serum glucose, reflecting even transient elevations of glucose within a few days. 1,5-AG has been shown to reflect daily glycemic excursions in patients with A1Cs at or near goal. (Dungan, Buse, & Largay, 2006)

METHODOLOGY

This chapter focuses on the research design and methods utilized in the study as well as the statistical tools that were applied in the results of the study.

Research Design

This study is a cross sectional type of research which aims to correlate the value of Urine and Serum 1,5-AG as a monitoring biomarker of glycemic excursions and diagnosis of type II diabetes mellitus.

Prior to the collection of research sample, participants will be divided into two categories: The Positive control and Negative Control. Participants will be chosen randomly and must meet the criteria for inclusion.

For Healthy Patients:

- Should be a resident of San Agustin III, Dasmariñas City, Cavite, with the age of 18 to 70 years old, male or female.
- Should not be diagnosed with Type II Diabetes Mellitus/ Hyperglycemia.
- No family history of diabetes/hyperglycemia.
- Should not be included in the list of Diabetic Individuals provided by the City Health Office of Dasmariñas.
- Has a weight proportional to age and height.
- Have not smoke for the past 24 hours before the sample collection.
- No alcohol intake for the past 24 hours before the sample collection.
- Must agree and sign the written consent provided by the researchers.

Patients diagnosed with Diabetes Mellitus:

- Should be a resident of San Agustin III, Dasmariñas City, Cavite, with the age of 18 to 70 years old.
- Validated to be a diabetic patient by their local health office or by a physician.
- Included in the list of Diabetic Individuals provided by the City Health Office of Dasmariñas.
- Has a family history of Diabetes/hyperglycemia.
- Have not smoke for the past 24 hours before the sample collection.
- No alcohol intake for the past 24 hours before the sample collection.

- No Over the Counter medicines intake that can raise blood sugar. (Common steroids include hydrocortisone and prednisone, thiazide diuretics, high doses of asthma medicines)
- Must agree and sign the written consent provided by the researchers.

Lycomark assay will be utilized as the testing kit for both positive and negative samples. Results for both serum and urine 1,5-AG shall be compared and measured to correlate for monitoring and diagnosis of Type II Diabetes Mellitus.

Research Locale

The study will be conducted at Barangay San Agustin III, a barangay in the City of Dasmariñas, province of Cavite, CALABARZON (Region IV-A), Phillipines. The collection and extraction of both positive and negative groups will be done at this barangay wherein the respondents will be interviewed in their houses or any comfortable place that the respondent will choose to. In addition, the actual procedures, analytical and post analytical phase will be performed at the Experiment and Skills Laboratory of the School of Medical Technology in Emilio Aguinaldo College – Cavite.

Ethical Clearance

Ethical Clearance was obtained and approved through the ethics review board of Emilio Aguinaldo College - Cavite. All participants will be asked to sign an informed consent form that they have been fully informed regarding the procedure of the research study at any potential risk. We the researchers will respect the confidentiality of all research respondents.

Sampling Size

10,204 is the Total Population of San Agustin III, Cavite. 151 are the number of new and pre-existing cases of diabetes. (Source: City Health Office of Dasmariñas)

Prevalence rate

$$= \frac{\text{All new and pre} - \text{existing cases of a specific disease during a given period}}{\text{Total population during the same period}}$$
$\times 100$

$$PR = \frac{151}{10,204} \times 100 = 1.48\%$$

The sample size is calculated by estimating a proportion using simple random sampling the formula used is as follows:

$$N = \frac{z^2 PQ}{d^2}$$

Where P is the anticipated value of the proportion to be estimated in the population, Q is 1- P, D is the margin of error or maximum permissible error; a measure of the desired level of precision for the resulting estimates, Z= 1.96 (based on the desired confidence level of 95%). P=0.019 (diabetic prevalence based on an ecological profile of the province of Cavite). (1.2%) is the prevalence rate of Type II Diabetes Mellitus based on the Ecological profile of Cavite.

Q= (1-0.0148) thus, Q is equal to 0.9852

D= 0.05

N = 22

Following the same formula for the negative group, 22 participants were also selected. All in all, 44 subjects willingly took part of the research and were separated into two groups. 22 participants were categorized in the diabetic group, while 22 participants were placed in the healthy group.

Sampling Population

All the participants included in the study will be randomly selected. The positive control group of the study consists of 22 individuals who are 18 years old and above and were previously diagnosed with Type II Diabetes Mellitus (HbA1c >6.5 %, Fasting Plasma Glucose > 126 md/dL, 2 hour OGTT 200 mg/dL, Random Plasma Glucose 200 mg/dL, with symptoms of diabetes). The purpose, nature, intention, procedure of extraction, collection and confidentiality of the results will be thoroughly explained in detail to the volunteer subjects before a written consent form was taken. In contrast, the negative control group of the study consisting of 22 healthy individuals who are 18 years old and above and no history of Diabetes. In similar way, the purpose, nature, intention, procedure of extraction, collection and confidentiality of the results will be explained well to the volunteer subjects before a written consent type was taken. The selected individuals must also sign first the given written consent before proceeding to any test procedure and must also restrain from taking Chinese medicines such as Polygala tenuifolia and Senega syrup prior to sample collection.

Data Gathering Procedure
Sample Collection

The researchers extracted blood samples from 22 healthy participants and 22 diagnosed Type II Diabetes Mellitus patients through venipuncture method and were placed in a serum separator tube. The collected blood samples were allowed to clot for 2 hours before centrifugation for 20 minutes at 3500 rpm. Serum was separated from the whole blood and stored at -20° to -80° C for 1 week.

Along with the blood samples, a first morning urine sample was also collected from the same participants using a sterile urine container provided by the researchers. The samples were centrifuged for 20 minutes at 3500rpm to separate the supernatant which was transferred into another test tube and stored at -20° C to -80° C for 1 week before the analysis.

For research purposes, the sample collection for both blood and urine was made early in the morning to secure the real time concentration of 1,5-AG for both fluids. For the diabetic participants, the researchers ensured that the extraction was made prior the injection of insulin.

Preparation of Samples

The blood and urine samples that was aliquoted and stored at -20° C to -80° C for 1 week was thawed in the room temperature to ensure that the samples are all in liquid state prior the processing of the test. After thawing, all the samples were re-centrifuged for 10 minutes at 3500 rpm.

Preparation of Raegant
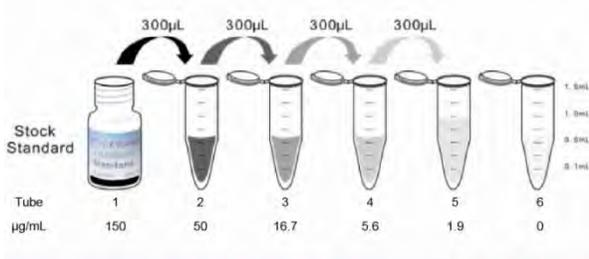
Figure 2: Demonstration of dilution series for the reagent preparation

All the kits and samples were brought to room temperature (18-25° C) before use. The standard used was reconstituted with 0.7mL of Standard Diluent, kept for 10 minutes at room temperature, and was shaken gently (not to foam). The concentration of the standard in the stock solution is 150µg/mL. The researchers prepared 5 tubes containing 0.6mL of Standard Diluent and produced a triple dilution series according to the picture shown in Figure 1. Each tube was thoroughly mixed before the next transfer then 5 points of diluted standard such as 150µg/mL, 50µg/mL, 16.7µg/mL, 5.6µg/mL, 1.9µg/mL, were set up and the last EP tubes with Standard Diluent is the blank as 0µg/mL.

To prepare the Detection Reagent A and Detection Reagent B, the researchers briefly centrifuged the stock Detection A and Detection B before diluting them in the working concentration 100-fold with Assay Diluent A and B, respectively. To prepare the Wash Solution, 20mL of Wash Solution concentrate (30×) was diluted with 580mL of deionized or distilled water to prepare 600mL of Wash Solution (1×). And for the TMB substrate, the researchers aspirate only the needed dosage of the solution with sterilized tips.

Sample Procedure

A *Lycomark* Enzyme-linked Immunosorbent Assay (ELISA) kit for 1,5-Anhydrogluitol was utilized by the researchers for the study. Reagents and a pre-coated well were all provided by the manufacturer for this specific assay which is intended for research purposes only.

The procedure started by determining wells for diluted standard, blank, and samples. In a 96-well plate, the researchers allocated 5 wells for the standard points and 1 well for the blank concentration. A measurement of 50uL each of standard, blank, and samples were added to the pre-coated wells respectively. Immediately, a measurement of another 50uL was made by the researchers, this time Detection Reagent A was added. After the first 2 steps, the plate was sealed using a plate sealer to gently shake and mix the following solution by the aid of a microplate shaker for 1 minute. Following that, incubation at 37° C for 1 hour was done to allow the solution to mix and settle.

After the 1 hour incubation made, all the solution present in the 96 wells of the plate were removed and washed with 350uL of 1X wash solution provided in the kit. The whole washing procedure was done thrice using an automatic microplate washer. To ensure that all the solutions were completely removed from the well, the plate was inverted and snapped into an absorbent paper multiple times until it looked dry in the inside of the well. Detection Reagent B was then added to the wells and sealed with a plate sealer to gently shake and mix the solution. Once again, the researchers incubated the plate at 37° C to allow the solution to settle down for 30 minutes.

The same step with the microplate washer was done in the next procedure for 5 times and again inverted and snapped in a blotting paper to ensure a complete removal of the solution in the well. Then a substrate solution with a measurement of 90uL was added before covering the plate with a plate sealer for a 20-minute incubation at room temperature. A blue liquid is expected to happen once the substrate settles down with the solution. Straightway, a 50ul stop solution was added in each well anticipating a transformation of color blue to yellow solution. The researchers made sure that no interference, such as bubbles, any form of droplets around the well, and fingerprints on the bottom of the plate remains before the reading. This is to ensure that an accurate result should be obtained for this research.

For the last procedure, the microplate was processed and read through a 450nm wavelength microplate reader immediately after the all the assay preparations.

Data analysis

All data for statistics is tabulated and processed using SPSS-IBM. Likelihood it is used to determine the significant difference between the level of 1,5-AG for both body fluids. On the other hand, determination of sensitivity, specificity, diagnostic capability, and the ROC curve are

obtained from a web-based calculator for ROC curves from Eng, 2017 of Johns Hopkins University School of Medicine.

RESULTS AND DISCUSSION

This chapter presented the data obtained from the study as well as the discussion for each result.

COMPARISON OF 1,5-AG LEVE

	Mean	df	t	p Value	Interpretation
SERUM					
Normal	173.44	42	12.68	0	Significant
Diabetic	25.03	21.63	12.68	0	Significant
URINE					
Normal	24.70	42	-8.52	0	Significant
Diabetic	154.02	21.36	-8.52	0	Significant

Table 1: Comparison of normal and diabetic 1,5 AG values from urine and serum samples (n=22)

The mean concentration for urine 1,5-AG from normal individuals is 6-fold decreased against the urine from diagnosed Type II Diabetes Mellitus patients. Similarly, a 7-fold increased normal serum is noticeable against the 1,5-AG levels seen in diabetic serum.

The statistical data of this research supports the findings of Akanuma et al 1988, that urine 1,5-Anhydroglucitol is largely retained in the circulation and only partly excreted in urine under normal conditions. In the diabetic group, the urinary 1,5-Anhydroglucitol showed an appreciable correlation with the urinary glucose. This observation suggests that 1,5-Anhydroglucitol excretion might be promoted by a high blood glucose concentration. This concept is further supported by the elevation of the urinary 1,5-AG concentration as seen in the table with an average concentration of 154 which is closely related in elevation of the blood glucose concentration in manner resembling to the urinary glucose concentration. *Figure 3* shows the graphical illustration of concentrations of urinary 1,5-AG of normal and diabetic respondents.

Figure 3: *Comparison of Urinary 1,5-Anhydroglucitol*

Thus, in this study, the researchers were able to present that the levels in healthy individuals, 1,5-Anhydroglucitol blood level remained relatively constant being excreted in the urine when its level exceeds the renal threshold. On the other hand, *Figure 4* presents the illustration of serum concentration for normal and diabetic individuals.
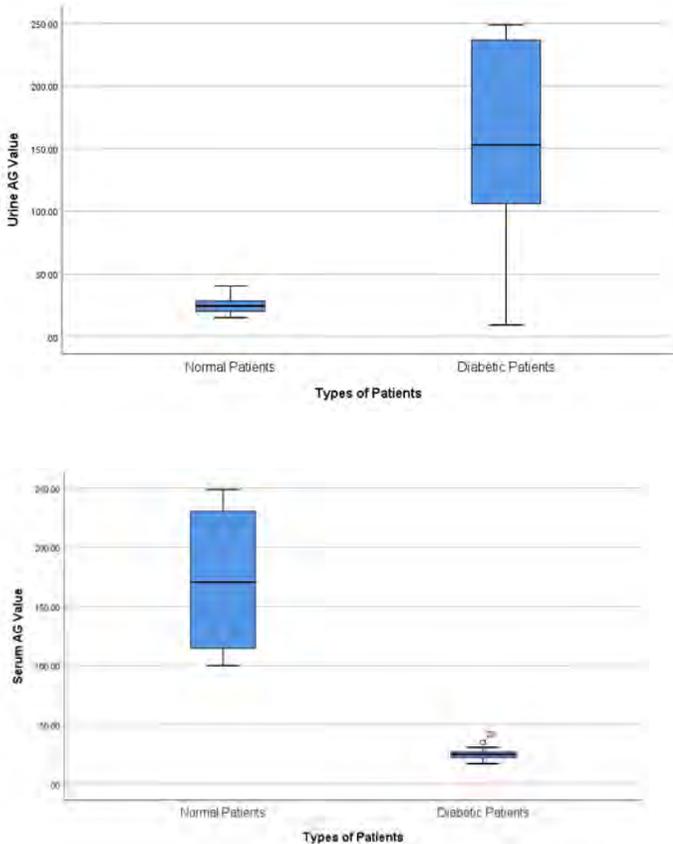

Figure 4: *Comparison of Serum 1,5-Anhydrogluolcitol*

In statistics, a p-value of 0.00 indicates a very strong evidence that comparison of levels for both urine and serum 1,5-Anhydroglucitol in normal and diabetic individuals show that the test done is significant *(table 1)*. This is analogous to the t-value not equal to zero proving that the sample results are not exactly equal to a null hypothesis. Thus, the statistical data of the study greatly supports the findings observed by the researchers indicating that there is an evident difference in the levels of

1,5-Anhydroglucitol from a two different samples of normal and diabetic participants.

URINE 1,5-AG AS A PREDICTOR OF SERUM 1,5-AG

Table 2 is a Linear Regression of urine 1,5-AG it represents the statistical evidence to whether urine 1,5-AG can be a possible clinical tool for diagnosis of Type II Diabetes Mellitus.

	Coefficients				
Model	Unstandardized		Standardized		
	B	Std. Error	Beta	t	Sig.
1 (Constant)	24.512	2.290		10.702	0.00
Urine Diabetic	0.003	0.014	0.055	0.248	0.807

a. Dependent Variable: Serum Diabetic

Table 2: Linear regression of Urine 1,5-AG

The best fit predictive model for urinary 1,5-AG as a predictor for serum 1,5-AG is expressed using linear regression with this formula y= 24.512 + .003(x). Where (*y*) represents the computed value of serum 1,5-AG. The alpha-value of 24.512 which is a constant value plus beta-value .003 in linear regression, is the urine 1,5-AG correction factor then finally multiplied by x. The value of x represents the given concentration of urine 1,5-AG in a sample. Based on simple linear regression.

Parallel to the study of (Akutsu, 2007) serum 1,5-Anhydroglucitol (1,5-AG) has been known as an index for glucose testing that sensitively reflect glycemic conditions, more robustly than HbA1c, it is also mentioned that 1,5-AG is an appropriate index for evaluation of postprandial hyperglycemia. This statistical data shows evidences that a non-invasive method of measuring 1,5-Anhydroglucitol level can be possible through testing of urine 1,5-AG.

DIAGNOSTIC CAPABILITY OF URINE 1.5-AG

This study employs the competitive inhibition enzymatic immunoassay technique. A microplate that has been pre-coated with monoclonal antibody specific to 1,5-AG. The gathered data obtained was parallel to the study of Namba et all (1994) which used HPLC-immorbilized enzyme method comparing the values of serum and urinary AG levels, lower 1,5-AG level was significantly seen in serum AG level compare with urinary AG level in diabetes mellitus patients. On the other hand, same levels of result was seen in the study of Tajima et all (1993) which used the method of both high performance liquid chromatography-ezyme sysytem (HPLC-ES) and gas-liquid chromatography/mass spectrophotometry (GS-MS) with satisfactory correlation (r=0.994) but

unfortunately with GS-MS method urine samples were not possible for routine work
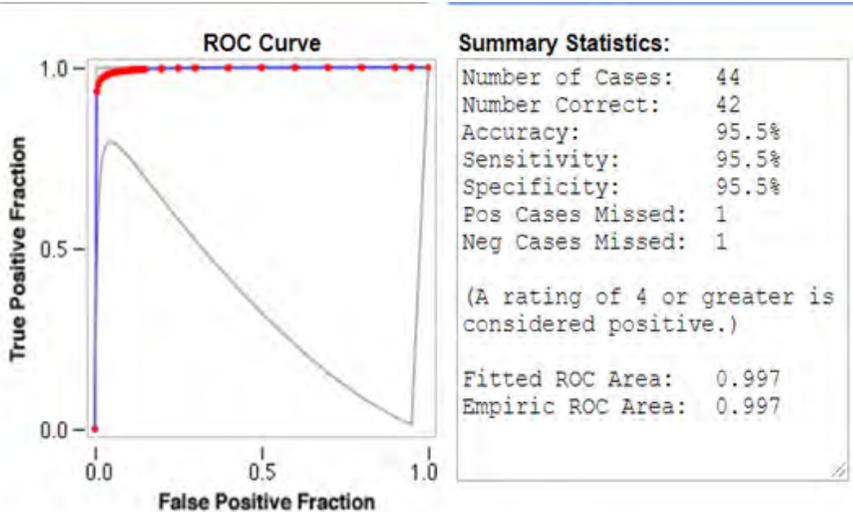
Figure 5: *ROC curve of Urine 1,5-AG*

As shown in Figure 5, A graphical plot known as receiver operating characteristic (ROC) is used to present the test's diagnostic ability of binary classifier system. Using ELISA method specific for 1,5-AG the study showed, out of the 44 subjects both 22 diabetic subjects and 22 healthy subjects had missed 1 positive and negative case, respectively. Through the data collected, the mean was calculated for a specific level of control. Standard deviation formula was used to quantify how close the numerical values are in relation to each other. A 12-38ug/ml reference range was established through the mean's ±1s and ±2s to arbitrate true positive rate (TPR) and false negative rate (FTR). As shown in ROC curve in figure 5, ELISA method specific to 1,5-AG gave an accuracy, specificity and sensitivity of 95.5%, a positive predicitve value and negative predictive vaule of 97.7% and fitted roc area and empiric roc area result of 0.997, respectively. Hence, gives the curve closer to the top left corner that indicates better and accurate performance.

Sensitivity values showed the proportion of the 44 subject with both 22 diabetic and normal, that gives the reflection of true positive rate with diabetes meliitus, while specificity gives the proportion of the 44 subjects to measure false positve rate. ELISA method specific with 1,5-AG was used in urine as an alternative non-invasive biomarker, 95.5% in both sensitivity and specificity gathered in the study were near the findings of Ying et all (2012) with 82.5% of sensitivity and 83.5% of specificity which

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supported the study of Shirasaya et all (1999) that the sensitivity and specificity using 1,5 AG enzymatic method was 83.8% and 88.1% respectively. This can be explained through the statement of Dabrowska et al (2012) and Yamanouchi et al (1994), 1,5-AG is a highly sensitive and useful analitycal marker that can be used as a subsitute postprandial glucose measurements, complementing HbA1c and fructosamine measurements.

The sensitivity and specificity of the test is calculated using the formula that follows:

$$Sensitivity = \frac{TP}{TP + FN}$$

$$Specificity = \frac{TN}{TN + FP}$$

If there are 21 true positive and 1 false positive thus, a 95.45% sensitivity result is calculated for the sensitivity test. On the other hand, if there are 21 true negative and 1 false negative then a same result of 95.45% for specificity was gathered. Accuracy of the test also gives a 95.45% using the accuracy formula.

The area under the curve (AUC) is an effective way to assess the performance of a test. An AUC of 1.0 is interpreted as a perfect test, while an AUC of 0.5 tells that a test is weak (Ekelund, 2012). In the study Urine 1,5-AG obtained AUC of 0.997 in testing whether the analye found in urine is a possible biomarker for type II diabetes mellitus. See *figure 5*. An AUC between 0.80 – 0.90 interprets a method as an excellent test (Mandrekar, 2010). Therefore, Urine 1,5-Anhydroglucitol is capable of being a diagnostic tool for Type II Diabetes Mellitus.

SUMMARY, CONCLUSION AND RECOMMENDATION

The study which is a Cross Sectional, Descriptive type of research was mainly conducted at the Medical Technology Skills Laboratory of the School of Medical Technology in Emilio Aguinaldo College – Cavite.

Urine and blood samples from 44 individuals were gathered for this research. Half of the group is comprised of individuals diagnosed with Type II Diabetes Mellitus, while the other half is composed of individuals who have not been pre-diagnosed with Type II Diabetes Mellitus to be used as control. Participants were chosen thoroughly using an in inclusion and exclusion criteria that would best fit the study. The blood and urine samples obtained were analyzed for 1,5-AG concentration using an ELISA microplate reader with a wavelength of 450 nm. Simple linear regression was used to determine correlation.

From the results, urine 1,5-AG showed positive correlation with serum 1,5-AG in diabetic patients. The test is found to be a useful tool for diagnosis upon testing the ROC curve validating the accuracy, sensitivity, and specificity of the analyte. The study suggests that urine 1,5-AG may be a non-invasive predictor of serum 1,5-AG in diagnosis of type II diabetes mellitus.

CONCLUSION

A non-invasive method of diagnosing Type II Diabetes Mellitus can be done using the concentration of urinary 1,5-anhydroglucitol. Study shows that levels of 1,5-Anhydroglucitol is varying for normal individuals and individuals diagnosed with Type II Diabetes Mellitus. This enormous variation of concentration between the two can build a presumption that the difference can be a marker for possible abnormalities. In this study, the statistics shows that (1) there is a significant difference in levels of 1,5-AG in urine of normal individuals, (2) the relationship built for urine 1,5-AG and serum 1,5-AG through linear regression show that concentration of urine 1,5-AG may be a possible predictor of serum 1,5-AG for diagnosis of Type II Diabetes Mellitus. Thus, comparison of levels of urine 1,5-AG among different individuals alone can be a potential diagnostic tool for Type II Diabetes Mellitus.

RECOMMENDATION

The researchers recommend for the future studies: (1) to compare the 1,5-AG values of men and women, different age groups and other conditions such as pregnancy. In this way, future studies may be able to correlate the values according to different variables. (2) Correlate results of 1,5-AG to the current gold standards in the other markers of diabetes which are HbA1c, fructosamine and 2hr-OGTT.

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Gov. D. Mangubat Avenue, Burol Main,
City of Dasmariñas, Cavite 4114, Philippines
http://www.eac.edu.ph/cavite / (046) 416-4341 to 42

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