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***In-vitro* Evaluation of Anti-diabetic Potential of *Sansevieria trifasciata* var. *Laurentii* (Agavaceae) Leaf Extracts**

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Abstract

The anti-diabetic potential of the leaf extracts of *Sansevieria trifasciata* var. *Laurentii* was determined via *in-vitro* evaluation. The aim of the study was to evaluate the anti-diabetic potential of the leaf extract of *Sansevieria trifasciata* var. *Laurentii*. Phytochemical analysis revealed that the desired constituents (phenols, saponins, and flavonoids) were extracted using methanol as solvent with acceptable band separation using thin layer chromatography. Quantitative phytochemical analysis revealed a gallic acid value of 3.36 36 µg/mL. The anti-diabetic potential was confirmed via α -amylase activity (79.59% to 94.72 % inhibition) and non-enzymatic glycosylation of hemoglobin (54% inhibition).

Keywords: : α -amylase, anti-diabetic, non-enzymatic, *Sansevieria trifasciata* var. *Laurentii*

Introduction

Diabetes mellitus, is classified as a metabolic disease in which a person has severe or absolute insulin deficiency that can be categorized into immune and idiopathic causes. According to Cavan (2017), one of the most non-communicable diseases globally is diabetes mellitus particularly for the middle and low-income countries.

The long-term diabetes complications can be prevented by polyphenolic compounds and high total antioxidant capacity which decreases hyperglycemia, dyslipidemia and insulin resistance. According to Nair *et al.*, (2013), α -amylase, which is a key enzyme, acts as a good inhibitor in the utilization of glucose which is present in pancreas. A potent standard inhibitor of α -amylase activity is acarbose, an antihyperglycemic agent which binds 1000x more than natural carbohydrate to intestinal disaccharides and delays the absorption of sucrose, starches, maltose and dextrins. Meanwhile, without the presence of controlling enzyme, the sugar molecule will bind to a protein or lipid molecule and may result to non-enzymatic glycosylation. With this, non-enzymatic glycosylation is considered as a post-translational method of most

body proteins. The other way to prevent hyperglycemia in diabetic person is by using plant derivative products composed of dietary fiber and complex polysaccharides such as cereal and whole grains, potatoes, and rice (Abdullah & Kasim, 2017).

Natural sources such as plants have been associated to be an excellent source of therapeutics and medicinal advantages. Globally, there are more than 800 anti-diabetic plant species reported in ethnobotanical literature. *Sansevieria trifasciata* var. *Laurentii* also known as snake plant is usually associated as a house decorative and as a source of fibers (Dulla, 2016). It is a succulent plant with a thick rhizome, its leaves are composed of one or combination of two and it is rigidly straight. The blades are striped with varying colors, green and white (Sandoval, 2013).

According to Qomariyah, *et al.*, (2012), the therapeutic efficacy of *Sansevieria* is incorporated to its analgesic and antipyretic properties while its medicinal efficacy is used for the treatment of earache, pharyngitis and urinary disease. The juice extracts of *Sansevieria* contains alkaloids, flavonoids, tannins, saponins, carotenoids while its

rhizome part exhibits the existence of palmitic acid (Deepa, *et al.*, 2011).

The objectives of this study include evaluating the anti-diabetic potential of *Sansevieria trifasciata* var. *Laurentii* via in vitro evaluation using α -amylase inhibition and non-enzymatic glycosylation of hemoglobin. It also assessed the phytochemical constituents present in the plant extracts which may be responsible for the said activity.

Methods

The *Sansevieria trifasciata* var. *Laurentii* plant samples were accumulated from Barangay Sangkayon, Juban, Sorsogon and were authenticated at the University of Santo Tomas Research Center for the Natural and Applied Sciences. The accumulated plant leaves were subjected to shading and were dried for 72 hours resulting to a powder form. One hundred and fifty grams (150g) of the leaf powder was immersed in 900 mL of the corresponding solvents (1:6) to obtain the crude extract; the filtrates were collected and concentrated using a rotary evaporator.

Direct extraction and phytochemical analysis

Hexane, ethyl acetate and methanol were the solvents used for direct extractions and phytochemical analysis. These reagents were procured and acquired from Bellman Laboratories. The following experiments were conducted at the University of Santo Tomas-Legazpi Laboratories and Instrumentation Department (USTL-LID).

Qualitative phytochemical analysis

The extracts were subjected to phytochemical analysis to examine the presence of alkaloids, flavonoids, phenols, saponins, tannins, carbohydrates and glycosides (Arumugam, *et al.*, 2013).

Thin layer chromatography

The researchers spotted the extracts on the pre-coated silica plates using different solvent system mixtures such as ethyl acetate: methanol, hexane: ethyl acetate, and methanol: hexane in varying ratio (1:9, 2:8, 3:7, 4:6, 5:5, 6:4, 7:3, 8:2, 9:1, 10:10)

(Subramania, 2014). It was visualized using UV lamp and exposure to iodine vapors.

Quantitative phytochemical analysis

Determination of total phenol

A mixture of 0.5 mL of FCR, 0.5 mL of the methanolic extract was incubated for 15 minutes and 2.5 mL of saturated sodium carbonate was added to the mixture following the addition of water to produce a final volume of 10mL, then allowed to stand for 30 minutes at room temperature. The absorbance of the final solution was measured at 750 nm at varying Gallic acid concentrations (100 mcg/mL, 300 mcg/mL, 400mcg/mL, 500 mcg/mL, 600mcg/mL). The total phenol content of the solution was expressed as Gallic Acid Equivalents/g sample, the absorbances obtained were utilized to construct a calibration curve.

Evaluation of anti-diabetic potential

α -amylase inhibition and non-enzymatic glycosylation of hemoglobin were the two methods utilized for the evaluation of anti-diabetic potential of *Sansevieria trifasciata* var. *Laurentii*.

Alpha-amylase inhibition method

Sufficient α -amylase enzyme were dissolved in 2.0 M phosphate buffer (pH 6.9) to obtain the enzyme solution. 1 ml each of methanolic extracts with various concentrations (250, 500, 750, 1000 μ g/mL) (Abirami, *et al.*, 2014), enzyme solutions, and starch solution were mixed and subjected to incubation for 10 minutes. 2 mL of dinitrosalicylic acid (DNS, color reagent) was added to the mixture to terminate the reaction. This mixture was then heated in a water bath for 5 minutes. The absorbances were measured at 540 nm using UV visible spectrum (Arumugam, *et al.*, 2013). Acarbose, an alpha-amylase inhibitor was used as standard (Arumugam, *et al.*, 2013).

The inhibition percentage for α amylase inhibition at 540 nm and non-enzymatic glycosylation of hemoglobin at 520 nm were computed using the given formula:

$$\text{Inhibition (\%)} = \frac{\text{Abs(control)} - \text{Abs(extract)}}{\text{Abs (control)}} \times 100$$

Equation 3.1. Percent Inhibition of α -amylase and non-enzymatic glycosylation of hemoglobin method

Where, Abs control is the absorbance of the control reaction (containing all reagents except the test sample) and Abs sample is the absorbance of the test sample (Nair *et al.*, 2013).

Non-enzymatic glycosylation of hemoglobin method

The stock solutions were prepared by adding Glucose (2%), hemoglobin (0.06%) and Gentamycin (0.02%) to the phosphate buffer (pH 7.4). The ratio for the mixture of the above solutions and the methanol extract is 1:1(v/v). The resulting solution was incubated for 72 hours and its absorbance measured at 520 nm using UV-visible spectroscopy. Metformin, with the brand name of Glucophage, was used as a standard.

Results

Qualitative phytochemical analysis

Table 1 reveals that among the three extracts, methanolic extract has the most extracted constituents (alkaloids, flavonoids, phenols, tannins, saponins and glycosides) compared to hexane and ethylacetate; therefore, this extract was subjected to further evaluation of its anti-diabetic potential.

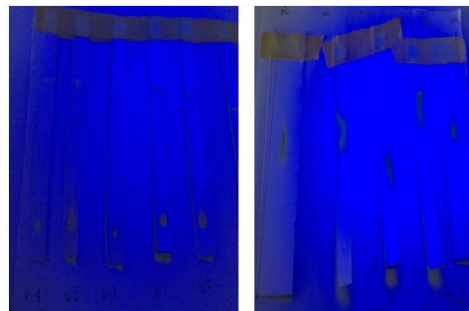
Table 1. Qualitative phytochemical analysis of the different extracts

	Methanol	Hexane	Ethyl-Acetate
Alkaloids	+	-	-
Flavonoids	+	-	-
Phenols	+	-	-
Tannins	+	-	-
Saponins	+	-	-
Glycosides	+	-	-
Carbohydrates			
Benedict's Test	-	-	-
Fehling's Test	-	-	-
Iodine Test	-	-	-

Thin layer chromatography

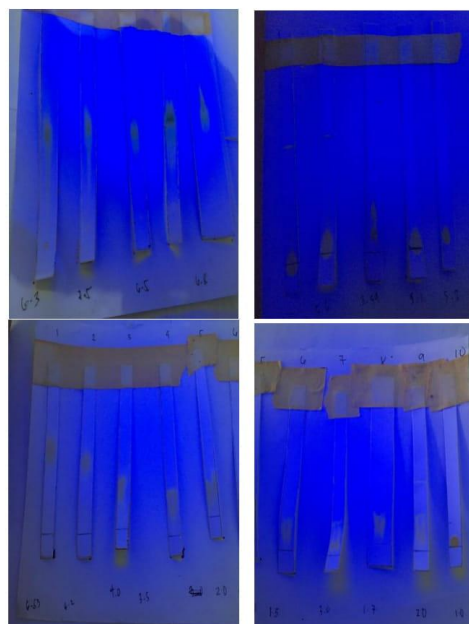
Among the solvents used, only the combined form of ethyl acetate:methanol being semi-polar and polar respectively in their nature form, demonstrated an acceptable separation of the organic compounds compared to the other

combined solvents. With the adjacent use of UV



lamp or money detector, these organic compounds were easily detected.

Figure 1. Ethyl acetate: Methanol



Figures 2 and 3. Hexane: Ethyl acetate plates

Quantitative phytochemical analysis

Determination of total phenol

Gallic acid concentrations 100 mcg/mL to 600 mcg/mL with a regression of 0.947 gave a plot that has a slope (m) of 0.146 and an intercept of 0.172. Based on these values, the following

standard equation curve was maintained $y = 0.146x + 0.098$ suggesting that the extract comprising phenol with an absorbance of 0.588 nm is very complex. Therefore the researchers concluded that phenol with an absorbance of 0.588 nm is very complex, and that phenol found in the experiment may be responsible for its antidiabetic potential.

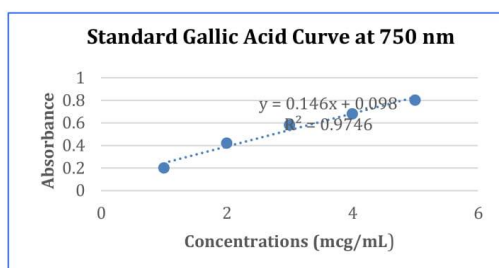


Figure 4. Standard Gallic Acid Curve at 750 nm

Evaluation of anti-diabetic potential

Alpha-amylase inhibition method

For alpha-amylase inhibition method, the percent inhibition of the standard (acarbose) diluted in methanol was 94.23 % while the standard diluted in water was 96.63 %.

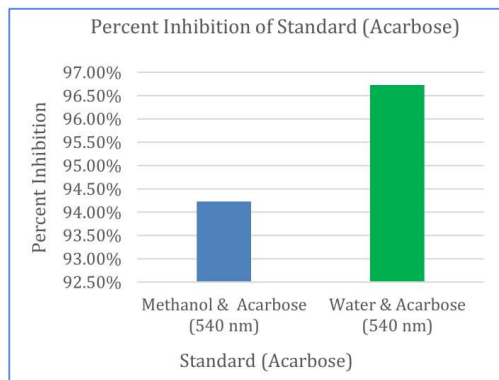


Figure 5. Percent Inhibition of the standard (Acarbose)

The percent inhibition of the methanolic extract diluted with methanol at varying concentrations (250 μ mL, 500 μ mL, 750 μ mL and 1000 μ mL). Two trials were conducted to compare their percent inhibition. Using the equation for the percent inhibition, the computed percent inhibition for the first trial was 74.00 %, 65.59%, 67.47%, and

79.59%; for the second trial it was 97.41%, 97.29%, 96.12% and 93.88%.

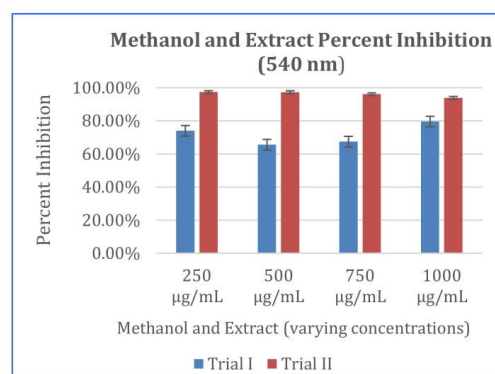


Figure 6: Percent inhibition of methanol and methanolic extract

The percent inhibition of the methanolic extract diluted with water was at varying concentrations (250 μ mL, 500 μ mL, 750 μ mL and 1000 μ mL). Two trials were conducted to compare their percent inhibition. Using the equation for the percent inhibition, the computed percent inhibition for the first trial was 93.65%, 93.39%, 93.19%, and 82.80%; for the second trial it was 94.99%, 85.70%, 93.05% and 94.72% respectively.

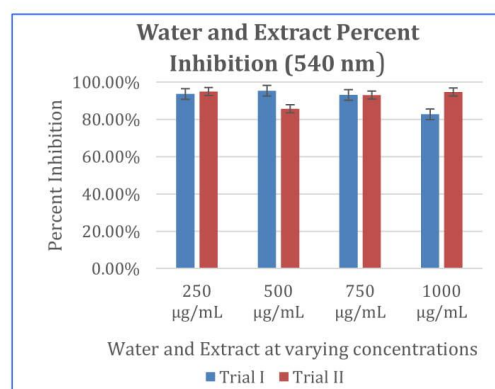


Figure 7: Percent inhibition of water and methanolic extract

Non-enzymatic glycosylation of hemoglobin method

For non-enzymatic glycosylation of hemoglobin inhibition method, the percent inhibition of the

standard (metformin) was 56.76 % and for the sample was 54.83%.

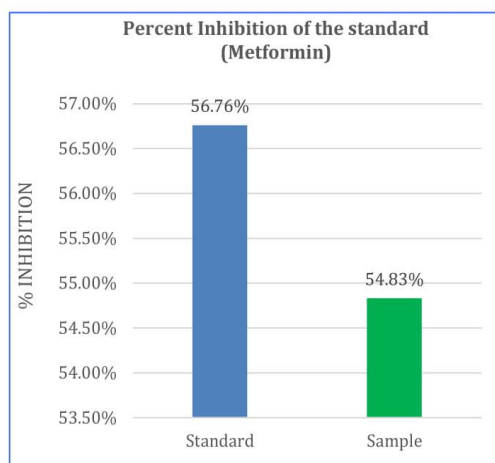


Figure 8: Percent Inhibition of the standard (Metformin)

Discussion

Intermolecular forces between the stationary and mobile phase and the concentration of the solvent and solute were considered as indicators for the separation of the organic molecules. The plate used in TLC was coated with aluminum foil containing an inert material such as plastic or silica was. The stationary phase used was methanolic extract while the mixture of ethyl acetate:methanol was used for mobile phase. The stationary phase, a polar in nature exhibited a stronger bond responsible for the slow movement of the organic molecules. The mobile phase, ethyl acetate:methanol were semi-polar and polar in nature, respectively, therefore some of the organic molecules move along with the mobile phase while the other developed an interaction with the stationary phase. With the adjacent use of UV lamp or money detector, these organic compounds were easily detected and differentiated. The inhibitory activity of methanol extract of *Sansevieria trifasciata* var. *Laurentii* on alpha amylase was investigated in this study and the results are shown in Table 2. In the alpha amylase inhibition assay, only trial 1 and trial 3 showed above 50% inhibition activity at the mentioned concentrations. Percent alpha amylase inhibition of plant extract was plotted as a function of concentration in comparison with acarbose as

shown in Figure 5. The results in every trial indicates that out of the four concentrations, 1000 µg/mL exhibited satisfactory anti alpha amylase activity both on trial 1 and 3, while, 500 µg/mL and 700 µg/mL showed perceptible inhibition activity also on trial 1 and 3. Lastly, 250 µg/mL showed the least inhibitory activity on trial 2. Therefore, the researchers' findings revealed that the methanol extract of the plant efficiently inhibited alpha amylase and the present study indicated that at a concentration of 1000 µg/mL, what could be useful in the management of Diabetes Mellitus.

The sample shows an excellent antidiabetic activity via non-enzymatic glycosylation inhibition. From the percentage inhibition of the standard and the sample, the researchers concluded that the sample exhibited same efficiency with the standard.

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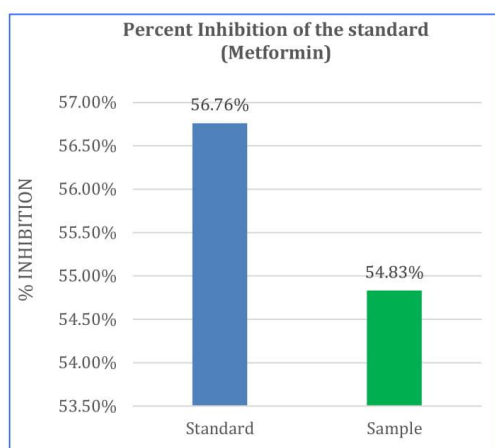


Figure 8: Percent Inhibition of the standard (Metformin)

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UNEARTHING FROM OBLIVION: RAISING CONSCIOUSNESS ON UNMARKED HISTORICAL SITES PRESERVATION IN SORSOGON CITY AND ALBAY

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Abstract

Due to urbanization, technological advancement, and globalization; the legacy of the Philippines' vibrant past, historical and material culture, are under constant threat of being forgotten. By using audio and visual documentation, Communication, as an academic field, helps in keeping important beliefs, traditions, and objects in the national consciousness of the people. The researchers believe that it is necessary to re-introduce the *Muralla*, the Church Ruins of Tabaco, and *Sinimbahan* as important historical sites in the Bicol Region via a documentary-narrative film titled *Unearthing from Oblivion: Raising consciousness on unmarked historical sites preservation in Sorsogon City and Albay*. The researchers were specifically guided by the following objectives of the study: a) to identify the sites' historical significance; b) to present the current state of the historical sites; and c) to raise consciousness on preservation of historical sites in the local and hopefully the national level. The researchers found out that the *Sinimbahan* of Tiwi, the Church Ruins of Tabaco, and the *Muralla* of Sorsogon City are important historical sites that are presently in dire and deplorable state. The people who found a new home within their walls do not realize the significance of their because of their lack of awareness. These structures were once home to the socio-political activities of Tiwi, Tabaco, and Sorsogon. However, due to the lack and/or absence of a written records and documents about them could lead to their "cultural and historical demise" --- completely forgotten and buried in oblivion. The outcome of this study solidifies the importance of media as a tool in documenting historical sites. If widely disseminated via different social media platforms, this documentary narrative can be used in educating people about the importance of forgotten cultural and historical sites.

Intoroduction

The Philippines is a country rich in culture and heritage which it owes to the fusion of Oriental and Western traditions. Not unknown to many, the country has developed close ties with its Asian neighbors since time immemorial, was under Spanish colonial rule for over 300 years, and was governed by the Americans for around 50 years. Even in the 21st

century, some of the material culture or artifact which the colonial powers erected remains extant. The Spaniards in particular, built churches in almost every town and constructed sturdy fortresses to protect places of importance that are vulnerable to attacks from enemies, mostly Moros.

The country's vibrant potpourri of cultures has left its mark all over the archipelago in many different forms that

attract present-day local and foreign tourists, mostly young adventurous adults. The rich Philippine heritage can be experienced, not only in textbooks and museums, but also in beautifully preserved historical sites across the country. A simple textbook description of a historical event comes to life upon a visit to the place where it unfolded (Department of Tourism, 2014).

However, the sad truth is that most of these historical sites have been left to decay before the very eyes of the Filipino people. Vandalism and sheer atrophy are some of the challenges faced by these bygone cultural structures – making them unrecognizably valuable. Cultural properties, as defined by Republic Act (R.A.) No. 4846, an act to provide for the protection and preservation of Philippine cultural properties, are old buildings, monuments, shrines, documents, and objects which may be classified as antiques, relics, or artifacts, landmarks, anthropological and historical sites, and specimens of natural history which are of cultural, historical, anthropological or scientific value and significance to the nation (Robles, 2014). Hence, the state and the people are accountable in its preservation and conservation for posterity.

According to Tankersley (2014) the government's effort on the conservation and preservation of cultural sites in the Philippines dates back to 1901. In 1933, American Governor-General Frank Murphy created a board called the Philippine Historical Research and Markers Committee (PHRMC) that was commissioned to find and to mark properties that could be preserved. After gaining independence from the United States after World War II, historical preservation related legislation involved the local setting in historical site programs. The 1953 R.A. No. 841 stated that district

or city engineers were designated to take charge in maintaining monuments and historical markers within their jurisdiction. Unfortunately, this was an unfunded mandate by the government. By 1965, the National Historical Commission (NHC) was tasked through R.A. No. 4368 to take care of all historical activities and projects. During the term of the late President Ferdinand V. Marcos, he established the Cultural Properties Preservation and Protection Act which detailed the role and responsibility of the state to preserve and to protect the nation's cultural properties and to safeguard its intrinsic value. Section 12 of the Act gave the authority to control and oversight historic monuments and sites to the National Museum instead of NHC – which managed historic sites for almost 30 years.

Upon the declaration of Martial Law, the late president continued in giving great importance and keen attention to historical preservation by designating several new national cultural treasures and historic sites. His administration instituted a fine of 10,000 pesos and a harsh penalty of ten-year imprisonment for anyone charged with damaging historical sites. The objectives of Marcos' agenda on historical preservation were: (1) to preserve national culture, (2) to foster better understanding of the nation's history, (3) to preserve world culture, and (4) to promote tourism.

At present, R.A. No. 10066, also known as the National Cultural Heritage Act, is an act that provides for the protection and conservation of national cultural heritage. The Act also declares that the state shall foster the preservation and enrichment of the dynamic evolution of the Filipino culture. It is the full duty of the state to create a balanced atmosphere where the past coexists in harmony with modern society; to balance the past and the present for the future and for the better promotion and understanding of oneself (NCCA,

2015). This responsibility is not only vested on the government; it is a shared duty of the people and the government – national, provincial, and local settings.

In spite of the many acts and laws that were amended and implemented for the protection of cultural properties in the Philippines, the appalling conditions of these properties show the Filipino's ignorance and lack of concern for their past. On the national setting, many historical buildings are no longer extant. People nowadays are more concerned about urbanization, effacing almost every little trace of the nation's colorful past. Some edifices that were sacrificed for "supposed progress" were the Rizal Theatre (where the Shangri-La Hotel now stands), the Avenue Theatre (now a parking lot and now occupied by Padi's Point (Lo, 2014)), and the Art Deco-designed Jai Alai Building (Villalon, 2012). These centuries-old structures are reminders of the former luster of Manila, once regarded as the "Paris of Asia." Moreover, outside the Philippine capital, Corregidor now is slowly deteriorating (Isla, 2015) as well as El Fraile in Manila Bay– the first and only battleship island in the world (David, 2013).

The 1987 constitution states that the state should preserve, develop, promote, and popularize historical and cultural heritage sites. Section 16 of R.A. No. 7160 of 1991 also states that the Local Government Units (LGU) play a big role in developing, promoting, and preserving the Filipino culture as well as in persuading people to participate in preserving the Filipino identity. Historical sites should perfectly blend with modern society as highlighted in R.A. 10066; however, the real setting contradicts what the law mandates. Disregard of historical sites is reflected on their walls, even *marked sites*, despite the existence of Presidential Decree (P.D.) No. 1505 that prohibits the unauthorized

modification, alteration, repair, and destruction of original features of all national shrines, monuments, landmarks, and other important historic edifices.

In the local setting, Bicol Region is a host to churches, caves, bridges, and ancestral houses that are witnesses to certain events in the country's history. In Sorsogon –the gateway province of Luzon to Visayas and Mindanao – a thick wall can be found. This fortress built in 1776, called the *Muralla* by the locals, is located in Bacon, Sorsogon City. This fortification served as a refuge to *Bacongnons* who sought safety from frequent Moro invasions during the Spanish rule in the Philippines. According to Cristina Jose (n.d.), an author of an untitled document about Bacon, the *Muralla* contains within its walls *baluartes* (watchtowers), a church, a cemetery, and other facilities.

Sadly, this once sturdy stronghold now lies in ruins. It is barely visible as it is now covered with herbage and occupied by informal settlers. Most of its walls form part of the houses and the market built in the complex; other ramparts were torn down or simply succumbed to natural decay due to its age.

Besides the *Muralla* of Sorsogon, two similar unmarked historical sites are found in the province of Albay. A further similarity among the three is that they were made from stock rubble stones and cemented by a mixture of "apog" (powdered seashells) and egg whites. But unlike the *Muralla*, the ruins of Tabaco and Tiwi are old town churches.

The Church Ruins in the City of Tabaco, 25 kilometers from Legazpi City, is located at Barangay Cormidal. According to Kurt Zepeda (2017), a local historian, Cormidal used to be a part of the ancient town center of Tabaco, owing to its distance to the shore of Lagonoy Gulf, during the Spanish occupation. The barangay was a strategic place to build a

house of worship made of nipa and bamboo. Zepeda further said that the first stone church, which is now in ruins, was constructed in 1600s. Just like the *Muralla*, the area within the Church Ruins of Tabaco City is now dominated by a labyrinth of houses built by the urban poor population. Passing by the main thoroughfare of Cormidal leading to the seaport, one would not even notice the ruins – that once upon a time an enormous stone church used to be standing there.

As mentioned, the other church in ruins is located in Tiwi, a municipality which is about a 20-minute drive from Tabaco City. While popular for its *terra cota* products, unknown to many a church ruins called *Sinimbahan* stands at the heart of Barangay Baybay. In an interview, Abdon Balde (2017), a Bicolano writer and a resident of Tiwi, said that *Sinimbahan* was the first stone church built in northeastern Albay, near its border with Camarines Sur, when Tiwi was still part of the municipality of Malinao in the 1700s. Similar to the *Muralla* and church ruins of Tabaco, *Sinimbahan* is now a residential area and is usually used as a parking space for vehicles.

Given the present physical condition of these ruins and their cultural obscurity to the locals, is it still worthwhile unearthing them from oblivion, to know their historical significance amidst other pressing issues in the 21st century? Jerome Dio, the Officer-in-Charge (OIC) of the Sorsogon Provincial Museum, believe that such endeavor is important. Dio (2017) further quoted Danilo Gerona (a known expert in Bicol History) saying: “...by knowing the story and the past, you begin to know who you are and you begin to know your identity as a person... because history is the soul of the person.” Meanwhile, Zepeda and Balde both agreed

that educating the people about this built heritage will pave the way for the revival this built heritage as beacons of culture and possibly as tourist attractions. All three also believed that preservation is necessary as supported by laws and goals of government agencies previously mentioned in the review of related literatures. This study is the first of its kind to document the three identified historical sites. This is the gap that this research bridged.

The compelling interviews with Balde, Dio, and Zepeda and the existing laws inspired and made the researchers believe that it is necessary to re-introduce the *Muralla*, the Church Ruins of Tabaco, and the *Sinimbahan* as important historical sites via a documentary-narrative film titled **Unearthing from Oblivion: Raising consciousness on unmarked historical sites preservation in Sorsogon City and Albay.**

The researchers were specifically guided by the following objectives of the study:

- A. to identify the sites’ historical significance;
- B. to present the current state of the historic sites;
- C. to raise consciousness on preservation of historical sites in the local and hopefully in the national level.

The researchers believe that the study would be of benefit to the following: (1) **Citizens of Sorsogon and Albay** for they would be educated on the importance of historical preservation. (2) **The Local Governments of Sorsogon and Albay** as this study would help them with legislating local ordinances on the preservation, improvement, and development of historical sites leading to further defining

the Bicol identity. (3) **Historians**, for this study would further provide them with an initial input for documenting these unpopular built heritages. (4) Lastly, to **Future Researchers** who would like embark on the same topic in the future; this research will serve as a good reference for them.

To clearly facilitate a better understanding of the research, the following terms used in the study are defined. According to Bjorneberg (n.d.) *preservation* involves keeping an object from destruction and seeing to it that the object is not irredeemably altered or changed. The final appearance is no longer the prime factor, but rather, retaining the maximum amount of building fabric. In this research it refers to keeping the ruins together as much as possible. Another term that is profusely mentioned in the research is *cultural property*. Based on R.A. No. 10066 also known as the National Cultural Heritage Preservation Act of 2009, cultural property is defined as “all products of human creativity by which a people and a nation reveal their identity, including churches, mosques and other places of religious worship, schools and natural history specimens and sites, whether public or privately-owned, movable or immovable, and tangible or intangible.” In this study, the *Muralla*, the Church Ruins of Tabaco, and the *Sinimbahan* are collectively called cultural properties which is also interchangeably termed as *built heritage* or *historical/cultural site* based on the narratives of Balde, Dio, and Zepeda. The word *unmarked site* also appears in the study. The term is used to distinguish the *Muralla*, the Church Ruins of Tabaco, and *Sinimbahan* from other historical sites, emphasizing the former’s anonymity to government agencies. There is no definition for the term unmarked site but R.A. No. 10066 has set the guidelines of a *marked site*. Article III, Section V of

R.A. No. 10066 states that a marked site is at least 50 years old and has been documented for 50 years. Though the historical sites in the study are more than 50 years old, the three are not significantly documented.

Conceptual Framework

Due to urbanization, technological advancement and globalization, the legacy of the Philippines’ vibrant past, historical and material culture, are under constant threat of being forgotten. One of the best ways to preserve important relics of the past is the use of media. By using audio and visual documentation, Communication, as an academic field, helps in keeping important beliefs, traditions, and objects in the national consciousness of the people.

The research is anchored on the Agenda Setting Theory of McCombs and Shaw which states that the media sets what issues should the public draw attention to. Whatever the media prioritizes becomes public priorities (Littlejohn, et.al 2009.). Therefore, anything that is shown by the media is taken by the audience as important issues to talk about. The main agenda of the present study are, to a certain extent, use the full potential of the media to introduce and/or re-introduce the *Muralla* of Sorsogon, the Church Ruins of Tabaco, and the *Sinimbahan* as important historical sites that are already forgotten and that in dire need of being preserved.

This paper is further anchored on Brandi’s (as cited by Awat, et.al, 2017) Theory of Restoration. Brandi states that the concept of restoration is generally understood as any kind of intervention that permits products of human activity to which the particular intervention called restoration should be applied. The researchers’ promotion of the sites, if successful, may lead to the site’s restoration and call for

action to Local Government Units (LGU) for funding the sites' conservation. The study becomes useful in documenting the sites' physical state.

The documentary-film, being the end product of this research, would put flesh to the Agenda Setting Theory and to the Theory of Restoration. Upon the completion of the documentary-film, it is

expected to be made available on social media platforms such as Facebook, Twitter, and YouTube to convey the historical significance of the sites, present their current conditions, and raise public awareness about them for preservation.

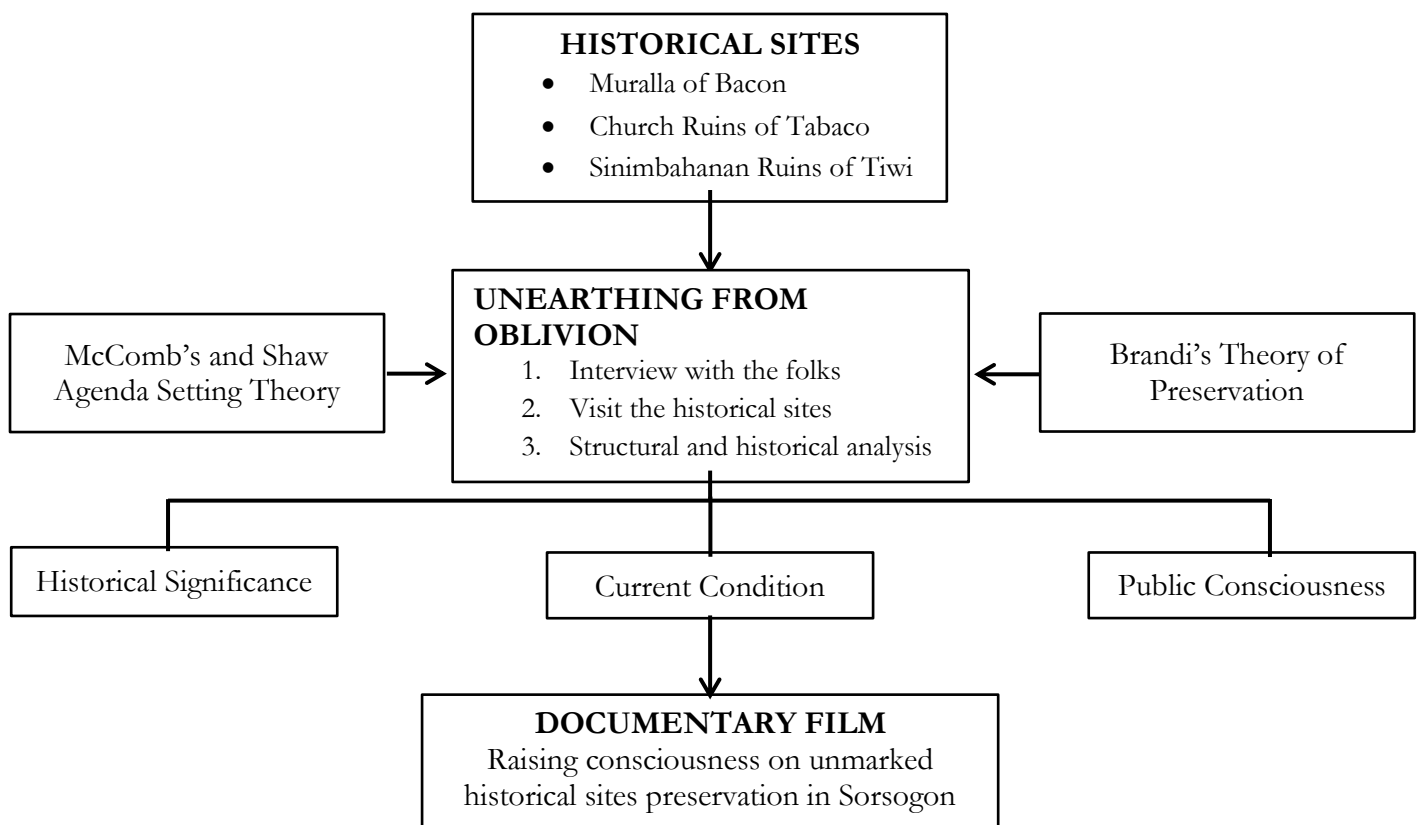


Figure 1. Conceptual Framework Model

aims to re-introduce publicly unfamiliar historical sites. The end product of this research is a documentary-film.

Methodology

This study is a qualitative descriptive research using structural and historical analysis of the sites as a technique, which

Data Gathering Process

In collecting the data, the researchers used a semi-structured interview that contained

open-ended questions. The research respondents were its key informants – residents, historians and/or public officials – supplementing the research with factual information. The focus of the interview was on the history, significance, preservation efforts, and awareness of the sites.

To further facilitate the interview, the researchers used a Digital Single Lens Reflector (DSLR) camera and a drone – used for bird's eye view shots. The editing software, Adobe Premier, was used during the post-production process.

The following stages were undertaken by the researchers:

A. Pre-production

This stage includes the preparation for the research. The researchers planned for the concept of the documentary (storyline and storyboard) and constructed an interview questionnaire. The researchers prepared the papers needed for the documentation like letters of consent and set appointment for the interviews.

B. Production

On this stage the researchers executed all the plans created in the pre-production process. This is where the researchers conducted the interviews and captured raw footages for the documentary film. The researchers used a DSLR and a drone to shoot scenes relevant to the documentation. The researchers went to the location.

C. Post- production

This stage includes the editing of video clips and the formulation of the script based on the raw materials gathered on the documentation. The researchers carefully chose and sequenced the clips in the film

with the use of appropriate editing software and technique.

Key Informants of the Study

The researchers interviewed residents who were at least 50 years old during the conduct of the study and who have been living in the sites most of their lives. All the interviewees agreed to appear on the documentary-film output of the research using their real names.

In Bacon District, Sorsogon City, the researchers interviewed Mr. Renato Desuyo, Mrs. Ester Dayot, and Mrs. Elizabeth Dineros. Desuyo has been a resident of *Muralla* for almost 70 years while Dayot and Dineros for almost 60 years. For the Church Ruins in Tabaco Mr. Edigeo Buwasan, a resident of the area for almost 60 years, and Barangay Captain Maria Esmenda were interviewed. As for the the *Sinimbahan* of Tiwi, Mr. Abdon Balde, a multi-awarded writer, Bicol history and culture researcher, the Komisyoner ng Wikang Filipino, and resident of Baybay, Tiwi was the researchers' main point person.

Experts in history and culture were also interviewed. Mr. Jerome Dio, the OIC of the Sorsogon Provincial Museum and Mr. Kurt Zepeda of the Albay Tourism Office provided the researchers ample information on the historical value of the identified sites.

Subject of the study

The researchers focused on and limited their study to three historical sites in Bicol, particularly one in Sorsogon and two in Albay. The *Muralla* of Bacon, the Church Ruins of Tabaco, and the *Sinimbahan* of

Tiwi were chosen by the researchers based on the following criteria:

- a) They are unmarked historical sites or not recognized by the government;
- b) They are mostly unknown to people;
- c) They are subject to deterioration, a clear manifestation of neglect; and
- d) They are accessible to the researchers.

Results and Discussion

The Spanish colonial rule in the Philippines lasted for three centuries and it is no wonder that its influence, despite being foreign, was fully assimilated with our local culture and defined our national identity. Bicolanos are described as one of the most religious and devout Catholics in the country. Bicol is home to Our Lady of Peñafrancia who attracts thousands of pilgrims every year. There is hardly a town in the region where one does not see a church dedicated to the saints of the Catholic faith.

Even before these stone churches were permanently constructed in the present town centers, some of them could trace their origins to much older structures. One of them is the *Sinimbahanan* ruins of Tiwi which was recognized as the first stone church of the municipality before the church was moved to its present location

in the heart of the town. It was built under the guidance of Friar Pedro de Brozas, the minister of the place from 1655 to 1662, when Tiwi was still a visita of Malinao (Platero, 1880:257). It was built and still is located at in barangay Baybay which is only a few hundred meters near the shore. An ordinance of the Spanish government during their occupation ordered that all churches were to be built facing the sea. These churches were said to be equipped with bell towers that served two purposes – used during worship services and to protect and warn the people of any upcoming Moro raid.

The *Sinimbahanan* ruins of Tiwi proved to be sturdy. It is made of compact river rocks, or *mamposteriya* (rubble stones) intact with cement composed of powdered sea shells or “apog” with the mixture of egg whites. The rubble stones were believed to be brought from *Tuytoy*, a swamp near barangay Baybay. The exterior of the church, its interior walls, and floor were plastered with mud bricks - - reflecting the thriving terra cotta- based industry of the municipality. The ruins are also equipped with buttresses – a thick wall of rocks which served as columns to support the whole structure. The *Sinimbahanan* was a big church, even bigger than Cagsawa. Mr. Abdon Balde shared that priests leading the service needed to use a pulpit to be heard by everyone attending mass. This pulpit contained a sound board which functioned like a microphone.

Owing to its location near the sea, the church became a frequent target of raiding Moros. The rampant attacks of the Moros during those times were a show of

their resistance against the Spaniards and the Catholic Church (Zepeda, 2017). Because of this, the Spaniards reinforced the churches' walls by making them thicker and equipped them with cannons. Churches were also used as shelters for people in times of Moro assaults. Yet, even with the extreme preventive measures set up by the Spaniards, the Moro people continued to burn houses, to kidnap people and to ruin the lives of Filipino Christian believers. Legend has it that there existed an underground chamber beneath *Sinimbahanan* where locals used to hide when Moros would attack barangay Baybay. To avoid further harm to the denizens of Tiwi the whole community near the shore migrated to higher grounds. Thus, the *Sinimbahanan* was abandoned and left to deteriorate (Zepeda, 2017).

However, as peace in the area stabilized and population swelled, Tiwinhons once again started to occupy barangay Baybay. And now, *Sinimbahanan* still stands where it was centuries ago but the people have already forgotten the role it played for their ancestors. It is now covered with thick overgrowth, its walls vandalized, and its grounds used as a parking space.

A similar structure can be found in Tabaco City which is about a few-minute drive from Tiwi. Tabaco is one of the three cities in Albay and Tabaco has one of the fastest growing urban centers in the region. The city is home to two important historical and cultural buildings – the St. John the Baptist Church of Tabaco, a declared National Cultural Treasure since 2011, and the National Historical Commission of the Philippines' *marked*

building – the Smith, Bell & Company that is also known to be the retirement house of poet, Angela Manalang Gloria.

Besides the two edifices mentioned, there is one historical site that has long been forgotten by the people of Tabaco. It is the Church Ruins of Tabaco in barangay Cormidal, the very first stone church in the town. Similar to the *Sinimbahan* of Tiwi, the Church Ruins of Tabaco is made of rubble stones and cement called "apog." According to existing records this stone church in barangay Cormidal dates back in 1723 and was finished in 1731 (RCBLI, 2001:70; AUL, 2008:13). Before the establishment of this church, bamboo churches were built along with the Parish Church of San Juan de Tabaco in 1649. This building was burned by the Dutch, Camucones and Mindanao raiders (Anonymous, 1649:12 in Retana, 1895).

At present such structure is barely noticeable, although some of its walls still stand. Its condition is much worse than that of *Sinimbahan* of Tiwi. The area where the Church Ruins of Tabaco is has already been crammed with shanties. Most of the walls in the ruins were already demolished and some were noticeably used to support a few houses. In an interview with one of the oldest residents in the area, Mr. Edigeo Buwasan, the researchers found out that most of the occupants are not aware of the historical importance of the ruins. This was supported by a statement of the barangay captain, Ms. Maria Esmenda who said that their elders did not tell them of the significance of the place. She then suggested that the people in their place be

educated on its importance. In addition, Zepeda (2017) said that people lack appreciation of historical sites and their mindset before was: “*Kapag bago yun ang maganda. Kapag luma na discard na*” (New things are beautiful and worth keeping. If they are already old, they should be discarded).

The Spaniards did not only build churches but they also constructed fortresses with massive walls. One perfect and well preserved fortification in the Philippines is the *Intramuros* on Manila. Its name literally means “within that walls” and is usually referred to as the Walled City of Manila, being the center of the Spanish government during the colonial period. However, not known to many, it is not the only walled city or town in the country.

In southeastern-most part of Luzon lies the town of Bacon, now a district of Sorsogon City. Bacon district was then a visita of Casiguran, Sorsogon but in 1754 Bacon became a pueblo civil under the province of Albay. Like many of towns in the coastline of the region, Bacon was frequently subject to violent Moro invasions that resulted in murder and captivity (Jose, n.d.). As a solution to this, the Spanish government built the *Muralla*, which means wall in Spanish (Dio, 2017). It is a thick wall surrounding the heart of the town and beyond it are tall watchtowers. Similar to the walls of *Intramuros*, the *Muralla* served the same purpose of protecting the lives and properties in the town of Bacon.

The construction materials used to build the *Muralla* were river stones, “apog” (mixed with *basi*), and *tuba*. According to Mr. Renato Desuyo (2017), a

local of the place, said that based on what he heard from the elders men before would gather in the town square when they heard the church bells and would start to gather rocks and to boil ground sugarcanes. The bubbles from the cooked sugarcanes called *basi* would be added to the cement mixture.

Long after the colonial era and the inception of modernization, the *Muralla* still stands. However, it is no longer as imposing as it used to be. Only a few of its walls remain while most of them were either demolished or made to support houses and the town market inside it. One example of this utter disregard of the structure was the use of fragments of an altar in what is believed to be a cemetery. Mrs. Elizabeth Dineros said in an interview that her husband demolished the dais and used its debris as materials in constructing their toilet.

While it is true that the *Sinimbahan* of Tiwi, the Church Ruins of Tabaco, and the *Muralla* are historical sites, the people who found a new home within their walls do not realize how important these structures used to be. Perhaps they do but they destroyed them anyway because of the lack of awareness. Balde, Zepeda, and Dio all believe that it is not yet late to preserve these structural sites. They all recommended that proper documentation, research, and information dissemination may lead back to people’s awareness about them. Dio and Balde in particular suggested that the use of modern technology can be used to strengthen the ruins. Balde in particular suggested that laser scanning should be used to determine the structural integrity of *Sinimbahan* and

to discover other things that may be hidden beneath the ruins. Meanwhile, Zepeda and Dio believe that both the Church Ruins of Tabaco and the Muralla, respectively, could be potential tourist attractions. However, the problem with preservation is in moving out the residents. All residents interviewed said that they would be willing to cooperate with the entities for structures' preservation as long as the residents would be properly relocated.

The documentary-film of this research contains the detailed interview with the key informants. The researchers hope that upon the uploading of this documentary-film on various social media platforms, it would stir interest and educate or re-educate people about the historical significance and deplorable state of some historical sites in the Bicol Region.

Conclusions

Based on the findings, the following conclusions were drawn:

1. Historical sites are part of a place's identity. Some of them were once home to socio-political activities of a town. However, the lack and absence of written records or documents about them could lead to their "cultural and historical demise."
2. The lack of appreciation for and awareness of a place's historical significance could lead to its destruction. As a result of the growing demands of urbanization for space, historical sites become vulnerable to vandalism, demolition, or occupancy by informal settlers.
3. The media is a useful tool in documenting historical sites. If widely disseminated via different social media platforms, audio and visual documentaries can be used in educating people about the importance of forgotten cultural and historical sites. Moreover, it can be used in the promotion of preservation efforts that may gain funding from private and government agencies similar to what happened in the conservation of the Metropolitan Theater in Manila, Intramuros, Cagsawa Ruins, Daraga Church, among others.

Recommendations

From the conclusions that were deduced, the following recommendations are suggested for consideration:

1. Future researchers should explore and look for possible historical sites that necessitate documentation. Old structures, ruins, ancestral houses, and other supposed cultural and historical sites must be visited and elders might be asked about stories surrounding them. These stories from elders can be verified and may serve as a springboard for the search of written documents that may be found in local archives and provincial museums.
2. Possible cultural and historical sites should be identified by the local government units for preservation efforts. The LGUs should create a committee that would safeguard both marked and

unmarked historical sites under their jurisdiction. Furthermore, they should look for funding opportunities to support short and long term repairs and conservation.

3. More documentary-films should be created on the subject of culture and history. Future researches should start documenting churches, monuments, and other important structures in the Bicol Region before they succumb to deterioration, to demolition, or to catastrophic events like super typhoons and earthquakes.

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COMPARATIVE ANALYSIS BETWEEN THE PERCEPTIONS OF PASSERS AND NON-PASSERS IN THE CPA BOARD EXAMINATION

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Abstract

With academic excellence as one of the primary thrusts of the university, the researchers find it imperative that the university achieve an exemplary passing rate in the CPA board examination which is yet to be realized. The passing rate, a product of internal and external factors, can be improved through understanding both aspects. Internal factors pertain to those which are within the control of an individual, which include perceptions, while external factors are a residual term. This study also documented that there is a high percentage of passers from the students who received academic honours from elementary to tertiary, hence, they must be provided with further support by the administration.

Keywords: board exam, accountancy

Introduction

Accountants significantly influence the society. The functions of accountants are divided into four categories: public practice, academe, commerce, and government (Republic Act 9298). With the importance of accountants in the well-functioning of the society, the need for competent certified public accountants (CPAs) continues to increase (Fulay, Luna, Resurrecion, 2012). In fact, in 2014 the Department of Labor and Employment (DOLE) reported that the accountancy profession topped the list of the most in demand jobs in the Philippines (Santos, 2014).

Thus, the national government employs measures to ensure the rigorous screening of CPAs which include the CPA board examination given every May and October. It is believed to be one of the most difficult examinations due to its low national passing rates in comparison to

other government licensure examinations (Bala, 2008). Despite the demanding requirements to become a CPA, many aspire to become one.

In Aquinas University of Legazpi, the Bachelor of Science in Accountancy (BSA) program was first offered on January 20, 1992 under Government Recognition (GR) No. 0002. In 2005, the BSA program was phased out due to the university's consecutive unfit performance in the CPA board examination within a period of three years (this rule for revoking GR is now revised to "incompetent performance in 10 CPA board examinations within a period of 5 years" as per Order No. 3 Series of 2007 of the CHED).

In late 2008, the revival of the BSA program was initiated through the application for a new GR from the CHED Region V which was approved leading to

the issuance of G.R. No. 09 for the new BSA program of the university. Changes in the curriculum effective 2013 were also introduced, such as the increase in the number of years needed to complete the degree, from four years to five years, internship and inclusion of research requirements. These initiatives, along with other efforts, arguably achieved the goal of producing CPAs again. In October 2013, the university recorded a high number of passers 13 out of 50 takers transmuting to a 26 percent passing rate.

However, in the subsequent CPA board examinations, the performance of the university was lower in comparison to the results in 2013. In fact, in May 2015 the university only recorded a passing rate of 6.67 percent compared to the 35.78 national passing rate. The ratings slightly recovered in May 2016 when the university earned 23.81 passing rate compared to the 42.84 national passing percentage.

Rationale

With academic excellence as one of the primary thrusts of the university, the researchers find it imperative that the university achieve an exemplary passing rate in the CPA board examination which is yet to be realized.

The passing rate, a product of internal and external factors, can be improved through understanding both aspects. Internal factors pertain to those which are within the control of an individual, which include perceptions, while external factors are a residual term.

Perception plays an important role in all human undertakings since the ability to do or to not do begin in the mind. Centra and Gaubatz (2005) affirmed through the findings of their study that student perceptions are potent factors to their actual performance.

This current study is a comparative analysis between the perceptions of passers and non-passers to understand the mindset of a CPA board examination passer. The findings may serve as a guide to future takers and repeaters on how to approach the CPA board examination with a passer's mindset. Furthermore, the findings may be the basis of the university regarding which programs have to be continued because of the positive effects on the passers.

On the other hand, the findings may serve as a reference to the external factors, such as the takers' immediate families, teachers, and the university in helping address the perceived problems of the non-passers which hindered them from passing the CPA board examination.

Current state of research in the field

As to date, there are no comparative analyses yet about the topic of this study but there are numerous academic researches which share some common aspects with the topic.

Centra and Gaubatz (2005) found out that a high perception of learning translates to a high actual learning as measured by the course examination results of their respondents.

Further, Porter (2011) studied the perceptions of student-takers of the Georgia's Board of Regent examination. The findings showed that the student-takers had several perceptions, such as the importance of the regent's course to the results of their examination, which might somehow have influenced their actual performance.

Tan (2014) also discovered in her study that academic performance, aspirations, attitudes, and study habits have an impact on the performance of accountancy graduates in the CPA board examination. This finding is supported by

the study of Menecio (2002) in St. Louis University which found out that academic performance of accounting graduates had a positive relationship to their CPA board examination results.

The Expectancy Theory by Vroom (1964) also suggests that performance in any aspect of life is based on inner personal factors which include skills, knowledge, experience, abilities, and attitude. This notion is supported by Barcenas, 2014.

The association of a student's perception towards accounting to their CPA board examination performance is supported by the concept that successful identity formation requires a commitment to "a particular inner sense of who we are and to a particular set of social roles" (Winter, 1996, Gines, 2003). In this case, it is important that accounting students feel connected with the course and the accountancy profession so they will strive to pass the CPA board examination.

Furthermore, Duff and Atwaker (as cited in Delos Santos, 2014) state that individuals who have high perceived belief that they can influence the occurrence of events which affect their lives are strong, achievement-oriented, and appear to work harder in their intellectual efforts and performance tasks. They are also rewarded with better grades.

Sugahara and Boland (2014) also found out in their study in the Accounting Schools of Japan that majority of the students decided to attend the school for the sake of their intrinsic goals (e.g. personal growth and networking), rather than simply seeking to pass the CPA or Tax Accountants examination. The students also tended to rely on their own abilities and blame themselves for failure, rather than blame such on others. Avelino and Sanchez (2000) claim that taking responsibility for one's own action is important to success since it fuels self-

motivation and the ability to keep going towards the attainment of one's goals.

Papalia, Olds, and Feldman (2004) also found out that self-efficacy has an active role in self-actualization. Thus, students who are confident in their abilities of mastering academic and review materials and regulating their study habits are more likely to succeed in their endeavors.

Meanwhile, the Institute of Self-Esteem explains that those who suffer from low self-esteem experience negative outcomes because of their fear and anxiety. Negative outcomes include not passing an examination. This finding is supported by Chris Williams (2014), a Professor of Psychosocial Psychiatry at the University of Glasgow.

Papalia et al., 2004 also learned that schools must be "orderly, unoppressive, active, and energetic" to facilitate optimal learning experience for students. Owoeye (2011) notes that school facilities are potent factors to the learning process. The Helson's Adaptive Theory supports that humans' environment affects their perception and behavior.

Meanwhile, Bonina, Boragay, Canezo and Repaso (2006) found out the problems and sustainability issues of the BSA program of Aquinas University of Legazpi namely: (1) outdated curriculum, (2) lenient admission and retention policy, (3) lack of support from the administration for exposure seminars and conventions, (4) unclear discussion of lessons, and (5) inadequacy of books and references available to the students. They found out that these factors had an impact on the academic performance of the Aquinian BSA student's. The study of Diamante, Lacanlale, Lelis and Zaldua, 2004 had similar findings.

In relation to the competency of the Aquinas University of Legazpi faculty, Gojar, Marbella, Perdigon, Pura, and

Romano (2004) found out that the key issue concerning the hiring policy of the university is the observance of the *Padrino* system or hiring someone based on familiarity rather than the person's competencies. Other than such, no other key issues were identified.

The hiring policy of schools plays an important role in the development of competent accountancy graduates. Brammer and MacDonald (1996) pointed out that teachers play a significant role in the success of their students (supported by Guney, 2009). They also note that effective teachers should be dependable, responsible, be capable of problem-solving, promote an open atmosphere, serve as models and influencers, and have a strong sense of ethics.

Graczyk, Weissberg, Payton, Elias, Greenberg, and Zins (2000) supported the influence of adult peers on the academic performance of a student since they can serve as models of values aimed at reaching the optimal potentials of a student, convey rules to inspire a student to adopt self-enhancing values, and play an important role in the support system for a student, as in the case of teachers and reviewers.

Meanwhile, retention policy remains as a widely-debated issue in the field of academe. Brunnsden, Shelvin, and Bracken (2000) argued that retention policy is a complex topic which has personal, institutional, and societal impacts and that the negative impacts may outweigh the positive impacts of implementing retention policies. On the personal level, the inability to meet a retention policy lowers the self-esteem of an individual which may have life-long effects. While Ozga (1998) claimed that student attrition also damages the reputation of educational institutions.

On the other hand, Perez (2015) found out in his study that a higher

educational institution must implement stricter admission and retention policies to improve the passing rates in the CPA board examination.

Problem in the field

Currently, it has not been studied yet how the perceptions of CPA board examination passers and non-passers vary. Further, the common perceptions of passers which may have contributed to their success in the CPA board examination have not been summarized yet.

This research aims to understand the differences between the perceptions of passers and non-passers in the CPA board examination to provide a guide to future takers and repeaters and may help them pass the examination with a passer's mindset. Furthermore, the researchers will forward the output of this study to the program chairperson of the BSA for it may serve as one of the references for introducing improvements and sustaining current efforts aimed at meeting the desired passing rate of the university in the CPA board examination.

Objectives

Specifically, this research aims to:

1. Compare and analyze the perceptions of the passers and non-passers in terms of personal factors;
2. Compare and analyze the perceptions of the passers and non-passers in terms of teacher-related factors;
3. Compare and analyze the perceptions of the passers and non-passers in terms of school-related factors; and
4. Compare and analyze the perceptions of the passers and non-passers in terms of review-related factors.

Conceptual Framework

The researchers used the Systems Theory and the Input-process-output Model as the bases for the conceptual framework. Systems Theory shows how the components of a system can be broken down into separate entities or nodes to analyze them independently while acknowledging their interdependence through links (Walonick, 1993). While the Input-process-output Model shows how inputs (data) can be transformed into outputs (information) through certain processes.

The components of the framework for this study are: the inputs (Aquinian CPA board examination first-takers from October 2013 to October 2016), the processes (survey, classification into passers and non-passers of the respondents, and comparison, analysis, and discussion based on the perceptions of each group), and the outputs (recommendations and guide to achieve the desired university passing rate in the CPA board examination).

In this model, the nodes are the inputs and outputs while the processes are the link.

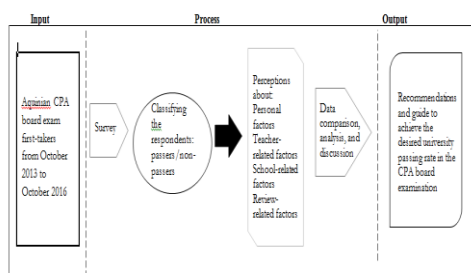


Figure 1: Conceptual Framework Scheme

Methods

This study follows a descriptive research design with survey as the data gathering tool.

Data Gathering

For the survey, the questionnaires (Form 1 in the Appendices) were sent to the takers via Facebook messages except for one who accomplished the form offline. The takers (sometimes referred to as first-takers or respondents and classified into passers and non-passers for comparison, analysis, and discussion) referred to in this study are limited to Aquinians.

For feasibility purposes, a collection period of three months, from December 2016 to February 2017, was allotted and only those who had submitted their responses until the cut-off were included in the sample for this study. Ninety survey questionnaires were retrieved which comprised the sample size.

The survey questionnaire had five sections, namely: profile of the respondent, personal factors, teacher-related factors, school-related factors, and review-related factors. The factors referred to in this study were perceived factors based on existing theories and the related literature. Further, the personal factors were limited to those controllable by the taker or internal factors.

For the profile, declaring names was optional in accordance with the identity confidentiality observed in this study. The respondents were also assured that the information they provided would be used solely for research purposes. The other data coming from the respondent's profile section include gender, year of graduation, year the CPA board examination was taken a sub-section for

the distinction/s received and background of the respondent from elementary to tertiary. The year of graduation and the year taken the CPA board examination served as the basis for the researchers to ascertain that all years covered by this study were represented. Meanwhile, the distinction/s received background allowed the researchers to document the percentage of passers who graduated with honors from their elementary, secondary, and tertiary years which may support existing studies about the positive association of academic performance in the tertiary level with the performance in the CPA board examination. This may likewise encourage the university to provide more support to academically excellent students and be a potential topic for future research.

Sample Distribution

Based on their year of graduation, more respondents were from batch 2016 which represented the most recent batch as of the date of this research. It was followed by batch 2013, batch 2014, batch 2015, and batch 2012. Batch 2012 had only one respondent since this study covers the CPA board examinations from October 2013 to October 2016 and most graduates take the CPA board examination in October of their graduation year. Meanwhile, batch 2015 had lower percentage compared to other batches because it had the least number of graduates as per the total population since the retention policy was strictly implemented during S.Y. 2014-2015.

As to the number of takers of the CPA board examination per year, batch 2016 had the most number followed by the graduates of 2013 and 2014, and 2015. Batch 2015 had the least number of takers because of a few number of graduates.

For gender, there were 26 male respondents and 64 female respondents.

In terms of distinctions received, 30 respondents graduated from elementary with honors of whom 30.00% passed; 26 respondents graduated from secondary with honors of which 38.46% passed; while 13 graduated in tertiary with honors of which 61.54% passed.

Factors Evaluated

Personal Factors

The personal factors contain five perceptions. The first perception is based on the Expectancy Theory by Vroom which posits that individuals who are motivated to experience positive outcomes are more likely to succeed (as cited in Nugent, 2009) and on the findings of Avelino and Sanchez (2000) that self-motivation is important to a person's success. Meanwhile, the second and third perceptions are founded on the Achievement Motivation Theory by Atkinson which states that individuals who have high motives for success would approach the test presented to them with an attitude that they can and they will succeed in accomplishing the achievement task presented to them (as cited in Nugent, 2009). Meanwhile, the fourth perception is supported by the Attribution Theory which states that high achievers attribute success to effort and ability (Brennen, 2017). On this basis, those who have exerted efforts to understand the CPA board examination subjects well since their tertiary years are more likely to pass the CPA board examination. For the last perception, Achievement Theory has been the reference. One of the theoretical constructs of the theory is that students are less likely to seek help from others when their cognitive competence is high and high cognitive competence may lead to higher

chances of passing the CPA board examination.

Teacher-Related Factors

Five perceptions are also under the teacher-related factors. The first perception is based on the findings of Ehiane (2014) that for students to learn well from all their subjects despite hectic schedules, teachers must impose discipline and strictness. This may be relevant to the BSA faculty since the program has hectic class schedules. Kelly (2004) also states that effective time management can lead to better academic performance of the students. The second perception is constructed upon the Theory of Performance which states that levels of knowledge and skills affect the performance of individuals and groups (Elger, 2017). The primary role of teachers is to ensure that their students receive the necessary knowledge and develop the necessary skills for the latter's success in the CPA board examination. The core driver of fulfilling such is the clear and complete discussion of the lessons included in the syllabus. For the third perception, the teachers can also provide review materials and other teaching aids for use in the CPA board examination which may result in better examination performances of the students as supported by the findings of Husen, et. al (1978) (as cited by Nambuya, 2013). For the fourth perception, per the Theory of Relevance, teachers can facilitate in-depth understanding through providing real-life examples and practical applications to which the students can relate to (Roberson, 2013). Finally, the Cognitive Theory served as the basis for the last perception which states that teachers must stimulate the arousal of disequilibrium in their students so students would seek answers and value learning (Biehler and Snowman, 1991 as cited by Brennen, 2017). This can

be done through asking thought-provoking questions and encouraging critical thinking. In this manner, the students may adopt a new way of thinking and know the gaps which they must fill in for their knowledge to be sufficient for the CPA board examination.

School-Related Factors

The first and second perceptions under school-related factors are supported by the Theory of Performance. Perceiving that the school has tight admission and retention policies may help the students have a higher chance of passing the CPA board examination knowing that they were well-honed and had the necessary knowledge, skills, and abilities. Nambuya (2013) also underscored that school-based factors significantly affect the learning process of the students and, their performance and competencies. The school has a fair share for its exam-takers to pass the CPA board examination. This includes the provision of useful accounting-related references (third perception), having good functioning facilities for a sound learning environment (fourth perception), hiring competent and qualified professors (fifth perception) and hiring experts who will regularly review the effectiveness of the BSA curriculum (sixth perception). Husen, et. al (1978) found out that providing adequate and quality physical learning materials to students yields to better examination performances (as cited in Nambuya, 2013). Meanwhile, the Adaptive Theory of Helson supports that humans' environment affects their perceptions and behavior. If students are placed in conducive learning environments, they can focus on their studies, think better, and thus, acquire quality learning. Furthermore, qualified professors are most likely to be successful in imparting positive rather than negative

outcomes to their students (Korir and Kipkemboi, 2014). Lastly, the curriculum, being the backbone of the BSA program, must be reviewed regularly by experts to identify areas of improvement and replacement. When the takers perceive all the aforesaid, it may positively affect their performance in the CPA board examination.

Review-Related Factors

For the review-related factors, the questions are categorized into two: formal review class and self-review. For those who attended a formal review class, the name of the review center attended was also identified. The researchers wanted to document the top review center choices of Aquinian graduates. In specific order, 62 respondents attended the CPA Review School of the Philippines (CPAR), 17 attended the Review School of Accountancy (ReSA), 7 attended the Accountancy Review and Tutorial Services (ARTS), 2 attended the Professional Review and Training Center (PRTC), and 1 attended the Casiño Review Center-ACE (CRC-ACE).

The factors under the formal review classes include five perceptions. For the first perception, the theory used is Lewin's Level of Aspiration which states that people who are generally successful set goals which are within their potential to achieve and confidently pursue them (as cited by Nugent, 2009). Hence, when the takers perceive that they have the correct ways and techniques of solving the problems in the CPA board examination, they may have a higher chance of passing. For the second and third perceptions, the Theory of Performance served as the basis. If the respondents perceive that their confidence and motivation to take the CPA board examination were enhanced as well as their discipline and perseverance, their

performance may yield positive outcomes. Confidence and motivation are key drivers of positive performance (Nugent, 2009). While discipline and perseverance are significant to passing the CPA board examination because of the challenges that accompany the exam itself and the preparation for it (Bala, 2008). For the fourth perception, Brammer and MacDonald (1996) pointed out that teachers play a significant role in the success of their students. The same is true to the reviewers. Competent reviewers can help the takers become more competent so they may pass the CPA board examination. For the last perception, Husen, et. al (1978) found out that making adequate and quality physical learning materials available to students yield to better examination performances (as cited in Nambuya, 2013). Hence, if the review centers have provided materials with items which appeared in the CPA board examination, it might contribute to the takers' success.

The study of Husen, et. al also served as the basis for the first perception for those who undergone self-review. Since the formal review classes' materials are well-designed by experts, the chance that a self-reviewing student who borrowed the said materials will pass, is higher. Meanwhile, the Theory of Performance served as the basis for the second perception. When a student is academically excellent during tertiary years, it is more likely that s/he has high level of accounting knowledge and skills and a higher chance of passing the CPA board examination. In relation to other commitments while studying, such as having a job, Orszag, Orszag, and Whitmore (2001) found out that working while studying may have negative effects on academic performance. For the fourth perception, the researchers wanted to

know whether it is the personal choice of the exam-taker rather than the dictates of his/her circumstances to self-review because the former may be indicative of self-confidence and self-motivation to pass the CPA board examination. For the last perception, the basis is the finding of the Institute for Higher Education Policy that consultations with mentors may positively impact students' persistence and academic achievement. Thus, students' consultations with deans or professors may positively impact their CPA board examination performance and results.

Data Analysis

The researchers used frequency tables and percentage columns to show the proportion of respondents into passers and non-passers and compare and analyze the two groups per perceptions of each factor. They allow the organization and summarization of the various data gathered in a tabular format and aid in the clear interpretation of the data. They also show the extremities in the survey data set (Lavrakas, 2008). Interpreting the data gathered based on percentages also helped in mitigating the limitation of this study in terms of the limited number of respondents. Conclusively, the methods were chosen based on appropriateness and clarity.

Records from the university registrar about the background and performance of the BSA program of the university in the CPA board examination also served as supporting inputs. The researchers also obtained a list of the takers from the Professional Regulation Commission (PRC) which served as the guide for sending out the questionnaires and for classifying the 90 respondents into two groups composing of 20 passers and 70 non-passers.

Results

Table 1 shows the five perceptions which characterize the motivation, confidence, persistence, academic attitude during their tertiary years and studying preference of the respondents.

Table 1
Personal Factors

	Passers		Non-passers		Total	
	Frequenc y	Perce nt	Frequenc y	Perce nt	Frequenc y	Perce nt
I was motivated to pass the CPA board examination.	18	90.00	52	74.29	70	77.78
I was confident that I would pass the CPA board examination prior to taking it.	6	30.00	11	15.71	17	18.89
I did not easily give up whenever I encountered difficulties in my pursuit of becoming a CPA.	20	100.00	51	72.86	71	78.89
I acknowledged the importance of the knowledge and training I gained from my tertiary years to my performance in the CPA board examination.	18	90.00	56	80.00	74	82.22
I preferred to study on my own rather than with a group of friends for the CPA board examination.	12	60.00	50	71.43	62	68.89

The results for the first perception show that the percentage of the passers (90.00%) who were motivated to pass the CPA board examination is higher than the percentage of motivated non-passers (74.29%). Furthermore, 77.78% of the total respondents were motivated to pass the CPA board examination.

The results for the second perception exhibit that the percentage among the passers is higher (30.00%) in

terms of confidence in passing prior the CPA board examination than the percentage among the non-passers (15.71%). In addition, only 18.89% of the total respondents were confident that they would pass the CPA board examination prior to taking it.

The data for the third perception show that all the passers (100.00%) did not easily give up when they encountered challenges in their pursuit of becoming

CPAs. The results also show a higher percentage among the passers who did not easily give up than the percentage among the non-passers (72.86%). Moreover, 78.89% of the total respondents perceived that they exhibited the attributes.

The results for the fourth perception display that the percentage is higher among the passers (90.00%) who acknowledged the importance of the knowledge and training they gained from their tertiary years to their performance in the CPA board examination compared to

the percentage among the non-passers (80.00%). Of the total respondents, 82.22% perceived that they acknowledged the said association.

The results for the fifth perception show that the percentage is higher among the non-passers (71.43%) who preferred to study on their own than the percentage in the group of passers (60.00%). Furthermore, 68.89% of the total respondents preferred to study on their own than with a group of friends for the CPA exam.

Table 2 exhibits the five perceptions which are all associated with the respondents' perception of their accounting professors in college.

Table 2
Teacher-Related Factors

Our accounting professors in our tertiary years:	Passers		Non-passers		Total	
	Frequenc y	Perce nt	Frequenc y	Perce nt	Frequen cy	Perce nt
Imposed discipline and strictness	11	55.00	41	58.57	52	57.78
Provided clear and complete discussions of our lessons	6	30.00	25	35.71	31	34.44
Gave review materials and other teaching aids for use in the CPA board exam	13	65.00	38	54.29	51	56.67
Related their topics to real-life situations or gave examples of practical applications	11	55.00	51	72.86	62	68.89
Asked thought-provoking questions and encouraged critical thinking	13	65.00	43	61.43	56	62.22

The results for the first perception show that the percentage is higher among the non-passers (58.57%) who perceived that their teachers had imposed discipline and strictness in comparison to the percentage in the group of passers (55.00%). In addition, 57.78% of the entire sample perceived that their accounting professors had imposed discipline and strictness.

Likewise, the data for the second perception show that there is a higher percentage among the non-passers (35.71%) who perceive that their teachers have provided clear and complete discussion of their lessons than the percentage among the passers (30.00%). Furthermore, 34.44% of the total respondents who perceive that their

professors provided clear and complete discussion of their lessons.

The results for the third perception exhibit that there is a higher percentage of passers (65.00%) who affirm based on their experience that their teachers gave review materials and other teaching aids for use in the CPA board examination is higher compared to the percentage of non-passers (54.29%) who also affirm the statement. Of the entire sample, 56.67% affirm the statement.

The results for the fourth perception show that there is a higher percentage among the non-passers (72.86%) who perceive that their teachers

have provided real-life examples and practical applications of their lessons than the percentage among the passers (55.00%). Furthermore, 68.89% of the total respondents agree to the statement.

For the fifth perception, the results show that there is a higher percentage among the passers (65.00%) who perceive that their teachers have asked thought-provoking questions which encouraged their critical thinking than the percentage in the group of non-passers group (61.43%). The percentage of the total sample that confirmed the statement is 62.22%.

Table 3 depicts six perceptions which all relate to the perceptions of the respondents about the university and its BSA program.

Table 3
School-Related Factors

University of Sto Tomas - Legazpi:	Passers		Non-passers		Total	
	Frequenc y	Percent	Frequen cy	Perce nt	Frequen cy	Perce nt
Has a tight admission policy for accountancy enrollees	2	10.00	16	22.86	18	20.00
Has a strict retention policy for the BSA program	3	15.00	30	42.86	33	36.67
Has provided useful accounting-related references	13	65.00	36	51.43	49	54.44
Has provided good functioning facilities for a sound learning environment	9	45.00	34	48.57	43	47.78
Made efforts of hiring competent and qualified professors	9	45.00	38	54.29	47	52.22
Made efforts of hiring experts who will regularly review the effectiveness of the BSA curriculum	4	20.00	13	18.57	17	18.89

The results for the first perception show that there is a higher percentage

among the non-passers (22.86%) who perceive that the university has a tight

admission policy for accountancy enrollees in comparison to the percentage among the passers (10.00%). Twenty percent (20.00%) of the total respondents affirmed the statement.

For the second perception, there is likewise a higher percentage among the non-passers (42.86%) who perceive that the school has a strict retention policy than the percentage among the passers (15.00%). Over-all, 36.67% of the sample perceived that the university has a strict retention policy.

The results for the third perception show that a higher percentage in the group of passers (65.00%) who perceived that the university has provided useful accounting references in comparison to the percentage among the non-passers (51.43%). Furthermore, 54.44% perceive the statement to be true.

For the fourth perception, there is a higher percentage among the non-passers (48.57%) who perceive that the university has provided good functioning facilities for a sound learning environment in comparison to the percentage among the

passers (45.00%). Of the total sample, 47.78% agreed to the statement.

The results for the fifth perception exhibit a higher percentage among the non-passers (54.29%) who believed that the university has made efforts to hire qualified and competent professors than the percentage among the passers (45.00%). The data also show that a total of 52.22% of the sample perceived the statement as true.

For the sixth perception, the results show that there is a higher percentage of passers (20.00%) who believed that the university has made efforts of hiring experts who regularly review the effectiveness of the BSA curriculum than the percentage of the non-passers (18.57%). Over-all, 18.89% of the sample affirmed the statement.

Table 4 exhibits five perceptions for respondents who attended formal review classes which are associated to the respondents' perceptions of the review centers they attended.

Table 4
Review-Related Factors

The review center I attended:	Passers		Non-passers		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Has provided me with the correct ways and techniques of solving problems which would most probably appear in the CPA board examination	20	100.00	63	90.00	83	92.22
Has enhanced my confidence and motivation to take the CPA board examination	19	95.00	58	82.86	77	85.56
Has instilled discipline and	15	75.00	45	64.29	60	66.67

perseverance in me						
Has competent reviewers who are experts in the topics they handle	20	100.00	67	95.71	87	96.67
Has provided materials with contents which appeared in the CPA board examination	15	75.00	45	64.29	60	66.67

The results for the first perception show that all of the passers (100.00%) perceived that their respective review centers had provided them with the correct ways and techniques of solving problems which had higher probabilities of appearing in the CPA board examination which is higher than the percentage among the non-passers (90.00%) who also affirm the statement. Of the total respondents who enrolled to formal review classes, 92.22% agree to the statement.

For the second perception, the results exhibit a higher percentage among the passers (95.00%) in terms of those who perceived that their review centers had enhanced their confidence and motivation to take the CPA board examination compared to the percentage among the non-passers (82.86%). On the basis of the respondents who enrolled in formal review classes, 85.56% affirm the statement.

The results for the third perception present a higher percentage among the passers (75.00%) who perceived had their review centers have instilled discipline and perseverance in them than the percentage among the non-passers (64.29%). Furthermore, a total of 66.67% based on the number of respondents who enrolled in formal review classes agreed to the statement.

The results for the fourth perception show that all passers (100.00%) perceived that their respective review centers had competent reviewers who are

experts in the topics they handled; among passers (100%) is higher than that of the percentage among the non-passers (95.71%). In addition, a total of 96.67% based on the number of respondents who enrolled to formal review classes, confirm the statement.

For the fifth perception, there is a higher percentage among the passers (75.00%) of those who affirm that their respective review centers had provided materials with contents which appeared in the CPA board examination in comparison to the percentage among the non-passers (64.29%). Of the total sample who enrolled in formal review classes, 66.67% agreed to the statement.

On the other hand, out of the non-passers there was one respondent who had undergone self-review out of the total sample. S/he affirmed that s/he borrowed review materials from students who already took the CPA board examination and believed that s/he had good performance in accounting subjects during his/her tertiary years.

The respondent had no other commitments during his/her self-review period. Furthermore, it was not his/her personal choice to undergo self-reviews; rather, it was the dictate of the circumstances. The respondent also did not consult his/her previous dean and professors for his/her preparation for the CPA

Discussion

The researchers summarized the common perceptions of the passers for each of the factors studied.

Under personal factors, the passers exhibited the following: motivation to pass the CPA board examination, confidence prior to taking the CPA board examination that they would pass, persistence, thus, not easily giving up amidst challenges in their pursuit of becoming CPAs, acknowledging the importance of the knowledge and training they gained from their tertiary years to their performance in the CPA board examination, and studying with peers rather than on their own.

The over-all perception of the passers in terms of personal factors is in congruence with the findings of Sugahara and Boland (2014) which state that most accounting students take responsibility for their actions rather than blame others for their failures.

The results are also parallel with the findings of Avelino and Sanchez (2000) and the Expectancy Theory that self-motivation is important to the success of individuals and groups since more of the passers were motivated. The high percentage among the passers who were confident that they would pass and did not easily give up despite the challenges in their pursuit of becoming CPAs likewise is supported by the Achievement Motivation Theory by Atkinson. The results are also reinforced by the Attribution Theory given a higher percentage among the passers who acknowledged the importance of the knowledge and training they gained in their tertiary years to their performance in the CPA board examination. For the last item, the results are not parallel with the theoretical construct that more passers preferred to study on their own. Alternatively, Sawyer (2005) explains that group discourse is effective in college

since it allows ample time for the students to comprehend and internalize what they have learned rather than the information overload which can occur if a student continuously takes in the input from the materials into his or her head, which is often the case inside the classroom and for studying alone. Schoenherr (2006) supports that more than 20 years of academic research has consistently demonstrated the same findings. The findings suggest that group or peer studies may be helpful methods of reviewing for the CPA board examination.

For the teacher-related factors, the attributes observed among the passers can be summarized into the following: a lower percentage of passers perceived that their accounting professors in tertiary have imposed discipline and strictness, have provided clear and complete discussion of their lessons, and related their topics to real-life situations or gave examples of practical applications in comparison to the percentage among the non-passers. Meanwhile, there is a higher percentage among the passers who perceive that their accounting professors in their tertiary years have provided review materials for use in the CPA board examination, asked thought-provoking questions, and encouraged critical thinking.

The results for the first teacher-related perception may suggest that students learn better from their teachers when students perceive teachers as welcoming rather than strict. Korir and Kipkemboi (2014) found out that professors who promote a welcoming atmosphere for the students facilitate a better learning process. This also supports the findings of Brammer and Macdonald (1996) about the attributes of an effective teacher. Urieh, 2017 also found out that moderate discipline is good ;on the other hand strict discipline has negative effects on the academic performance of students.

For the second teacher-related perception, the students who believe that they had not received clear and complete discussion of the topics that would be covered by the CPA board examination might have exerted extra efforts to compensate for what was lacking which led to a higher percentage among the passers who perceived the statement to be true. The findings do not corroborate the Theory of Performance since more passers perceive that there had been no clear and complete discussion of their lessons. The findings instead are consistent with the Cognitive Theory which states that disequilibrium motivates students to study more. The results further support the findings of Bonina, et. al (2006) about unclear discussion of lessons as one of the problems and sustainability issues of the BSA program.

For the third item, the higher percentage among the passers who perceive the statement to be true is support of by the Theory of Performance which underscores the importance of the support provided by the teachers to their students in their preparation for the CPA board examination in terms of quality review materials. The results further support Husen, et. al (1978) that adequate and relevant review materials positively affect students' examination performance.

For the fourth item, the results suggest that the takers acknowledged the importance of their tertiary studies to their performance in the CPA board examination regardless of whether practical applications had been related to their lessons, this is supported by the results for the fourth item under personal factors since there is a lower percentage of passers who perceived the statement to be true. The results further suggest that the Theory of Relevance may not have a significant positive relationship to the

performance of the respondents in the CPA board examination.

For the fifth item, the results are in consonance with the Cognitive Theory since there are more passers who believe that their teachers have asked thought-provoking questions which encouraged the students critical thinking. Triggering disequilibrium in the students and helping them develop critical thinking habits form a new way of thinking that may contribute to their good performance in the CPA board examination.

In summary for the school-related perceptions: that the percentage is lower among the passers who perceive that the university has a tight admission policy for accountancy enrolees and a strict retention policy for the BSA program, that the university has provided good functioning facilities for a sound learning environment, and that the university has made efforts of hiring competent and qualified professors. Meanwhile, there is a higher percentage among the passers in terms of respondents who perceived that the university had provided useful accounting-related references and that the university had made efforts of hiring experts who would regularly review the effectiveness of the BSA program.

The results for the first two school-related perceptions show that the insufficiency in terms of admission and retention policies might have caused disequilibrium in the passers; thus, they exerted more efforts to pass the CPA board examination. The results are not supported by the Theory of Performance but can be related to the Cognitive Theory. Initially, the researchers hypothesized that the strict implementation of admission and retention policies are the major causes of disequilibrium in student learning but the results suggest that the absence of the tight admission and strict retention policies may also cause disequilibrium. The results also

demonstrate that the problems identified by Bonina et. al (2006) were also perceived by the respondents which are lack of tight admission policy and the lenient retention policy. The opposing current studies about retention policy may suggest that retention policy may be strictly implemented to have better passing rates if the policy is well-designed and carefully implemented to mitigate or avoid the detrimental effects on the students' self-esteem.

For the third perception, a higher percentage of passers confirmed that the school has provided useful accounting references. This supports the studies of Papalia, et. al (2004) and Husen, et. al (1978) (as cited in Nambuya, 2013) which state that availability of quality books and materials for study, positively influence the performance of the exam-takers. The takers who perceived that the statement is true are most probably the ones who had access to the references and made use of it.

For the fourth perception, more non-passers believed that the university had provided good functioning facilities. The results suggest that Helson's Adaptive Theory does not have a significant positive relationship to the passing percentage of the respondents and that provision of conducive learning environments does not guarantee more passers. The Victorian Institute of Teaching found out that it is not the facilities per se that positively impact the students' performance rather it is their improved attitude towards learning because of the good-functioning facilities. Hence, even in the absence of the facilities but with the presence of the right learning attitude, the students will perform well. The study of Hannah (2013) also found out that the design of the learning environment has more significant relationship to the performance of students in lower educational levels, such as pre-school and

grade school, than in higher educational levels.

The results for the fifth perception corroborate the findings of Gojar, et. al (2004) that the university has no major issues with hiring except for the *Padrino* system. However, there were more passers from the group who did not believe that the university had made efforts of hiring qualified and competent professors. This may suggest that a disequilibrium had been experienced by the respondents because of their perception that they had not received complete and clear accounting support from their teachers and from the university, thus, they strived to do better.

For the sixth perception, the results show that more passers perceived that the university had made efforts in hiring experts to review the curriculum despite the low over-all percentage of those who perceive the statement to be true. This may suggest that the respondents who perceived that the university had an effective curriculum for the BSA program were more confident in their abilities to pass the CPA board examination as supported by the Theory of Performance. The results also support the findings of the study of Bonina, et. al (2006) which identified the BSA curriculum as one of the issues of the BSA program.

The summary of the perceptions among the passers for review -related factors (formal review classes) is as follows: all passers perceived that their respective review centers had provided them with the correct ways and techniques of solving problems which would most probably appear in the CPA board examination and that their respective review centers had competent reviewers who are experts in the topics they handled. Furthermore, there is a consistent higher percentage among the passers than among

the non-passers of the perceptions under this category.

For the first perception, the results support Lewin's Level of Aspiration Theory that individuals set goals which are within their capacity to achieve and approach such with an attitude that they can and they will since all passers acknowledged the statement to be true.

The results for the second perception exhibit that more passers perceived that their review centers had enhanced their confidence and motivation which coincide with the findings of Nugent that confidence and motivation are key drivers of positive performance.

For the third perception, a higher percentage among the passers perceived that their review centers have instilled discipline and perseverance in them which is consistent with the Theory of Performance and the existing study of Bala (2008) which states that discipline and perseverance are significant to passing the CPA board examination.

The results for the fourth perception show that more passers perceived that their reviewers were experts in the subjects they handled. This supports the findings of Brammer and Macdonald (1996) that competent teachers positively influence the performance of their students.

For the fifth perception, the findings are consistent with the study of Husen, et. al (1978) that making adequate and quality physical learning materials available to students yields to better examination performances (as cited in Nambuya, 2013) since more passers perceived the statement to be true.

The results for other factors for the respondent who self-reviewed confirm the Theory of Performance which states that various factors affect the performance of an individual. Hence, despite borrowing materials from students who already took

the CPA board examination and believing that s/he had good foundation of accounting knowledge and skills, s/he did not pass. The motivation of the respondent might have also been affected since it was not his/her personal choice to undergo self-reviews. The Attribution Theory states that it is important for individuals to take responsibility for their action for them to stand for it, despite difficulties. Furthermore, the respondent did not seek guidance from those who have already succeeded in passing the CPA board examination, such as deans and instructors. Doing so might have positively affected his/her CPA board examination outcome.

The key limitations of this study include the percentage of the sample in comparison to the total population and the lack of statistical tools used to determine the actual association between the factors studied and the respondents' CPA board examination performance.

The results of the study may help in improving the performance of the university in the CPA board examination by providing a guide to future takers and repeaters and suggesting recommendations for the improvement of the BSA program to the program chairperson. The improved performance of the university in the CPA board examination will further its vision of becoming a center of accountancy studies in the region and upholding academic excellence. The results also corroborate existing related studies about the topic and may induce more researchers to conduct academic studies on the factors affecting the performance of Legazpi Thomasian takers in the CPA board examination and board licensure examinations for other courses.

Conclusion

Legazpi Thomasian CPA board examination takers took responsibility for

their success and determination to pass. The common attributes of the passers include being motivated, being confident, being persistent, acknowledging the importance of their tertiary education to their CPA board examination performance, and studying with peers. Furthermore, support from the teachers, the administration, and the review centers in terms of ensuring that the takers have the necessary knowledge and skills and are well provided for with adequate and relevant review materials for use in the CPA board examination are influential to enhance the takers' passing probabilities. This study also documented that there is a high percentage of passers from the students who received academic honours from elementary to tertiary, hence, they must be provided with further support by the administration.

RECOMMENDATIONS

The researchers proposed the following recommendations based on the results of the study:

1. That future takers in the CPA board examination:

- a. Be motivated to pass
- b. Be confident that they will pass
- c. Be persistent and to not easily give up when encountering challenges in their pursuit of becoming CPAs
- d. Acknowledge the importance of the knowledge and training they gained from tertiary to their actual performance
- e. Engage in peer reviews

And during their review period:

- a. Be confident that their review centers will equip them with the correct ways and techniques of solving problems

- b. Be cooperative so their confidence and motivation will be further enhanced by their review centers

- c. Be cooperative so their review centers can instill discipline and perseverance in them

- d. Be confident that their reviewers are experts in the subjects they handle

2. For the accountancy faculty to consider the following:

- a. Imposing moderate discipline and promoting welcoming atmosphere inside the classroom

- b. Enhancing class time management to have clear and complete discussion of the lessons covered in the syllabus, such as allotting more time for the discussion on how to use accounting software in information technology subjects

- c. Continuing the provision of review materials to their students which may help them in passing the CPA board examination

- d. Enhancing the use of real-life examples and practical applications in facilitating better learning of the students

- e. Continuing to ask thought-provoking questions which encourage students to think critically

3. For the university administration to consider the following:

- a. Enhancing the admission policy for the BSA program, such as having a special class for selected enrollees who are awardees from elementary to secondary

- b. Observing enhanced and consistent implementation of the retention policy for the BSA program and continue having the aforementioned special class with the participants retained, added, or removed based on their academic performance

c. Enhancing the quality and quantity of the accounting references available for use in the library

d. Upgrading the existing facilities used for the BSA program, such as updated accounting software

e. Enhancing the existing efforts for hiring competent faculty who are actively practicing their accountancy profession, such as offering more attractive compensation packages for prospective applicants

f. Hiring experts in the field of accountancy to regularly review the effectiveness of the curriculum in preparing the students to become certified public accountants

g. Appointing personnel to keenly monitor the performance of the takers in the CPA board examination to better acknowledge passers, especially, outstanding performers

h. Implementing enhanced and sustainable peer review programs

i. Enhancing the support of the university to the takers, such as a kick-off event, and visits during review

4. Further tracer studies about the following topics:

a. Follow quantitative methods to establish the actual association on the factors studied to the performance of the takers, including more structured questionnaires

b. Tracer Studies to be conducted by the BSA faculty or other experts in the field of accountancy

c. Evaluate independently the factors studied to come up with more specific findings

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UST-Legazpi e-Bulletin with Automated Information Dissemination via SMS Notification

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ABSTRACT

The growing prevalence of technology has led educational institutions to use devices such as the monitoring of the students attendance and other automated school processes for more convenience and reliability. University of Santo Tomas-Legazpi is among those educational institutions. The immediate objective of this study was to develop a system that updates students on upcoming events through SMS notification and produce s administrative reports with the help of Semaphore (API). This research used Rational Unified Process in developing the prototype model, and use case model and swimlane diagram to present the system's flow and connection with users. This research used a database schema and dictionary to visually connect the system to UST-Legazpi's college department database so that future system analysts will understand the system's relevance to the institutions database. Throughout the study, the researchers perceived the possibility that the system can be upgraded with more functions and can also be used as a module in the institution's current web - application.

INTRODUCTION

In today's time, manual tracking of upcoming events is a laborious job. That is why social media such as Facebook is used to spread and view upcoming events, because it is currently an indispensable tool and companion to people. With social media, accessing and sharing information have become easier; it has assisted people in publicizing their opinions and taking part in social issues without hindrances (None, 2015). According to Claridge (2013), the mediums for information dissemination utilized included posters, local newspapers, local radio, and the traditional public meetings. The purpose of these activities was to inform the general public of the project and event that would be happening.”

The Philippines “Local Government Agencies (LGU) use Local Government Unit Information Dissemination System (LGUIDS) and data

collection for (1) disaster-related bulletins from PAGASA (Philippine Atmospheric, Geophysical, and Astronomical Services Administration), PHIVOLCS (Philippine Institute of Volcanology and Seismology), RDRRMC (Regional Disaster Risk Reduction and Management Council), MGB (Mines and Geosciences Bureau) and other disaster or emergency advisory agencies; (2) farming and fishing updates from DA (Department of Agriculture), BFAR (Bureau of Fisheries and Aquatic Resources), and EMB (Environmental Management Bureau); and (3) community announcements such as suspension of classes, community activities like town fiestas, job fairs, festivals, etc. (GOVPH, 2015).

Moreover, the government of the Philippines uses dissemination of nearby real-time hazards information and flood maps in the Philippines through Web-GIS (Geographic Information System), especially for a weather sensor. As part of

the development, Automated Weather Station (AWS) and Automated Rain Gauges (ARG) have been installed in key areas across the country to complement PAG-ASA's weather monitoring facilities. The AWS is monitoring stations equipped with different sensors capable of measuring wind speed, air temperature, air humidity, air pressure and rain amount. The weather data is sent wirelessly through cellular network as a text message through Short Messaging Service (SMS). Thus, with the help of technology, everything comes automated and efficient: from spreading announcements to transmission of weather or disaster-related data. Indeed, technology has contributed a lot in making this world a better place, especially for educational institutions. Various gadgets are used in schools nowadays.

The STI College Ortigas-Cainta students developed an Information Dissemination System that caters only to the “airing” of announcements but lacks provisions for student feedback provided an Android application that will instantly notify the student regarding the school announcements and student organization announcement. The International Institute for Science, Technology and Education (IISTE) also developed an SMS-Based Event Notification System to instantly reach the students through Short Messaging Service because it supports multiple users as well as multiple SMS gateways (liste.org).

The researchers deemed it necessary and important to adopt and use a similar system in the university. University of Santo Tomas-Legazpi (UST-Legazpi) conducts and organizes general and departmental activities like Paskuhan and Organization Week, may it be annually, monthly, or on a regular basis. These include academic and non-academic events organized by and for students. Events held at the University have corresponding points from the Office of Guidance and Testing (OGT) as Guidance is a mandatory subject for tertiary students from 1st year to 4th year. For every Guidance subject, the student must get a total of 200 points within one semester, which will be

given and earned through each event the student attends.

The biggest challenge, however, is the usual lack of attendees which is caused by several factors. Theoretically, informing the public about an event is not the only factor that affects the lack of attendees; it is also the lack of additional information. For instance, the organizer only announces what, when, and where the event is; brief description of the event is sometimes overlooked. The student may also know what the event is but the problem is that they do not know what it is all about. This requires immediate attention and solution to address student's lack of awareness in upcoming events.

The current system of information dissemination for activities involving students primarily involves the Office of Student Services (OSS) and the Office of Media, Alumni, and Public Affairs (MAPA). Considering at least 50 student organizations in the university, manual and physical dissemination require a lot of time and effort. The researchers came up with an idea to automate thus developed a website that will assist the school administrator in managing the posting and dissemination of events.

With a total of 2.32 billion smartphone users in the world, statistical projects a total of 2.87 billion subscribers in the year 2020. Moreover, the Philippines attained an average of 29.63 million subscribers from 2015 to 2017. From a million of smartphone users, the Philippines got only 28% from the total web traffic of mobile computing. That is below general average with Argentina, Brazil, Egypt, etc. (www.statista.com). Considering the students who lack internet connection, the researchers have provided

an SMS (Short Messaging Service) notification to reach users.

The researchers' system will have the following functions: first, an administrator (the MAPA) which tracks the outgoing information from the system. The privileges for the administrator include CRUD (Create, Read, Update, Delete) operations of organizations, accepting or rejecting event requests from its sub administrators, generating administrative report, and sending SMS notifications to students. To ease the comment thread among events, the system runs a filtering system; comments with profane words will be replaced with three dots. Furthermore, the administrator has the right to add profane words to the library in order for the system to get more basis in filtering comments.

Second, sub-administrators. Their privileges include requesting event from the administrator, viewing interested students, viewing feedback, and browsing event feed and event archive. The requested event maybe rejected for further revision. The registration for sub-administrators will also happen physically, meaning the P.I.O (Public Information Officer) of each organization must submit a proof in person to the office of an organization to confirm that he/she is a legitimate officer. The registration of the students is imported from the registrar's enrolment system to the database before every semester starts.

Lastly, the students. Their privileges include browsing the event feed, commenting, and reacting on a conducted event. The students can give a feedback through "thumbs up" and "thumbs down" button about the conducted event. Students may find it hard to give comments through the web app, hence, a single- threaded comment section is provided wherein the students can publicize their opinions. It can be in anonymous or with their names included. For administrators, the researchers added a reporting feature about the conducted events. It includes the following: all the events held, percentage of student's reaction per event, and number of events held. The web application will reach the students through SMS. It is enclosed with what, when, where, and who is the organizer of the

said event. The web application will not be able to track the student's Guidance attendance nor points, but there is an archiving system where the students can find the events already done. The features of the research also include the viewing of upcoming events.

Regarding the comment section, it has only one thread. Students can only comment and react where their participation is required. It could be anonymous or with their names included. Moreover, students can also still be aware of events in other colleges. For cancelling or re-scheduling an event, a reason or explanation is included in an SMS content that will be sent to the recipients. For security purposes, when a student logged in for the first time the system will ask the student for a new password.

The main objective of this research was to develop a web application to automate and simplify the dissemination of approved announcements from different organizations in the university.

Hence, the research aimed to find answers on how:

1. the student will interact with the web application;
2. the web application will reach the students; and
3. the administrator can keep track of the events.

Thus, the objective of the research was to develop a web application that will:

1. reach the students through SMS notification;
2. enable the students to react in a form of "thumbs up or thumbs down" button and give comments about an event; and

3. allow the administrators to produce administrative reports about the events.

The system is deemed beneficial to: the students, who are the ultimate recipients of any event happening in the university; the MAPA which facilitates information dissemination; and the OSS which coordinates with and supervises student organizations in the university. The administrator, sub administrators, and students need internet connection to access the web application. However, students who are not connected to the internet may still be notified through SMS.

This research has arisen as a secondary research on the usage of Web App over Native App; Also, the rate of mobile internet traffic from the total web traffic here in the Philippines. According to www.hsolutions.com, as mobile use continues to grow worldwide, the “app vs web” question will remain a very real consideration for organizations seeking to establish a mobile presence. In addition, it is also important to remember that a mobile/responsive website and a native app are not necessarily mutually exclusive. Plenty of organizations have both a mobile-friendly public website for their general web presence as well as a downloadable native app to accommodate more specific requirements. In the end, it is all about choosing the right tool for the job.

Methodology

The researchers used Rational Unified Process (RUP) for the development of the web application. RUP establishes four phases of development, each of which is organized into a number of separate iterations that must satisfy defined criteria before the next phase is undertaken; meaning the development of the web application will continue as needed to improve the research.

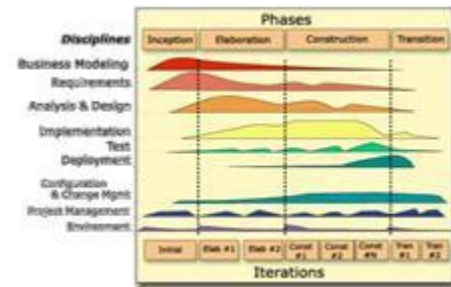


Fig 1 Rational Unified Process (RUP)

Each phase would have deliverables which are needed to continue to the next phase. *Inception* would produce the initial requirements for the researchers to start developing the system while *Elaboration* would produce more complex requirements such as databases and algorithms. The researchers would include the planning and designing of the system in the *Construction* phase.

The researchers documented the system in a Use Case Model which illustrates the system's intended functions (use cases), its surroundings (actors), and the relationships between the use cases and actors (use case diagrams). The most important role of a use case model is to provide a vehicle used by the customers or end users and the developers to discuss the system's functionality and behaviour. As for the *Transition* phase, the data gathered in testing the system will be the output. The researchers used stratified sampling to compute the total population of the respondents that had to take the survey.

The researchers also interviewed the OSS and the MAPA on how the process of publishing an upcoming event is done. Letters of agreement were also disseminated to the offices as they are the chosen venue for this research study. Also, a letter of request regarding the databases used in this research was submitted to the

Information Technology Center (ITC) (see Appendix A).

Table 1: P C system's requirement

Hardware	<input type="checkbox"/> 1 gigahertz (GHz) or faster 32-bit (x86) or 64-bit (x64) processor <input type="checkbox"/> 1 gigabyte (GB) RAM (32-bit) or 2 GB RAM (63-bit) <input type="checkbox"/> 16 GB available hard disk space (32-bit) or 20 GB (64-bit) <input type="checkbox"/> DirectX 9 graphics device with WDDM 1.0 or higher driver
Software	<input type="checkbox"/> Microsoft's 7 OS (Operating System) or higher <input type="checkbox"/> Mozilla Firefox latest version <input type="checkbox"/> Google Chrome latest version <input type="checkbox"/> Webhost

Table 1 shows the minimum system requirement for PC System. Since Microsoft Co. halted the support for Windows XP, the researchers chose to start from Windows 7 as their minimum PC System requirement for it has continued support from Microsoft. The webapplication is expected to run on any popular smartphone operating system including Android, Windows, and iOS as long as it has internet connection, a latest web browser, and is SMS enabled.

The *Elaboration* phase focused on analysis and design. The researchers determined the problems and objectives by choosing a venue that would prove its vision and objectives. The researchers chose University of Santo Tomas - Legazpi (UST-Legazpi) as the venue of this study

for it is in need of an information dissemination platform, which also suits the researchers' vision and advocacies.

The Relational Schema in Appendix C shows a graphical representation of the relationship among the user, organizer, and administrator within the system to help the users understand and define business processes as a foundation for this web application. UST-L e-Bulletin is enclosed with three users identified as the main administrator, student, and organizer.

The main administrator is responsible for enlisting the organizers and must contain the following fields: admin_id, admin_username, admin_password, admin_contact_number, and admin_email.

The student is the second and must contain the following information : student_id, student_id_number, student_password, student_fullname, student_course, and student_dept.

The organizer is the third; in this case it is provided by the main administrator. It must have the following information:

org_id, student_id, org_username, org_password, org_name, org_fb_page, and org_contact_number. The organizer identifies the event in the system, which must have the following information: event_id, org_id, student_id, event_name, event_loc, event_time, event date, and event type and event status. The organizer can also monitor who are interested among the students, who must satisfy the following information: is_id, event_id and student_id. However, the system caters page registry that will acts as a record of existing pages. It includes the following information: pr_id, page_name and site_alias

Lastly, the main administrator needs to give permission to its sub-administrator. The

web application must have the following information; p_id, org_id and page_name. Furthermore, when the event has ended it will be stored in an archive which needs the following: archive_id, event_id, org_id, feedback_id and date_ended.

The complete process of the system is shown using Swimlane Diagram in Appendix E. Once the web application has opened, the users will login using their ID numbers and passwords. It is mandatory for them to log-in to gain full access to the system. Once a user has logged in using their school account, an Application Programming Interface (API) requests the data from the database and retrieve the user's credentials permitting him/her to gain full access to the web application. The user can now interact with the web application. A decryption algorithm is applied to the user's password; same goes for the administrator's password.

After the login process, the user can now view the feed of upcoming events and interact with it. After the user has chosen the desired process, the API will be responsible for requesting and retrieving data from the database, and then a condition follows. *Is the user interested on an event?* If yes, the user can click the *interested button* from the interface then the API will send the data to the database. If the user is not interested in an event, he/she can trigger another function then another condition follows. *Does the user wish to react on a conducted event?* If yes, he/she can react using „*Thumbs down*“ button or „*Thumbs up*“ button and comment. The reaction input given by the user will act as a dataset along with the user's comment for the statistical output to be generated by the system. The comment section accepts anonymous and non-anonymous feedback. However, the web application runs a filtering algorithm to police user's feedback.

Word Filtering Algorithm Pseudo Code

1. Execute query to retrieve profane words from the database.

2. Insert profane words into a list named bad words.
3. Get student's comment.
4. Chunk student comment into tokens.

5

5. Store tokens into a separate List named token list.
6. Does the token list contain bad words?
7. If yes, prevent the student from sending the feedback.
8. Repeat number 6.
9. If no, comment will be sent to the database.

Once the user has entered a profane word, the system will automatically prevent the user from submitting until the ideal criteria of the system are met. The user has a choice to log out from their account. If the user wishes to log out, it would be the end of the process for the user. However, if the user does not want to log out, the user can repeat browsing the feed, react on the desired event or marking events he/she is interested in. The API will be responsible for requesting data from the database then send them to the web application, and show the user's desired output. The web application does not cater the computation of guidance grade of the student for this study is only focused on automated dissemination of information.

The web application will have two types of administrators: the organizer and the main administrator. The organizer is the type which is registered by the main administrator. An organizer will be granted with special permissions on the web application including: request event for posting, view event statistics, view list of interested students, and view student's

feedback. *Does the user wish to request event for posting?* If yes, the API will send request to the database then wait for the approval from the administrator. *Does the administrator approve?* If not, the user may need to revise the request until the request marked is approved by the administrator. When the request is approved by the administrator, another condition follows. Also, if the organizer needs to view the statistics about the events conducted, the API will retrieve the data from the database, then calculate the pre-defined variables and show them. If the organizer wishes to view the list of students who are interested in the event, then the web application through API will provide the list of interested students. Lastly, if the user wishes to view the student's reaction and feedback, the web application provides a feature that can do such.

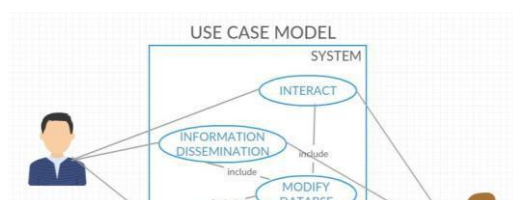
The main administrator is responsible for approving and monitoring all outgoing information that can be seen by the students and organizers. The administrator is also responsible for the registration of organizers to the system.

The next phase is the *Construction phase*. Once the problem, objectives, and system requirements" had been recognized, the researchers started the development of the system and produced the user manual (see Appendix H).

Fig. 2. Use Case Model

The Use Case Model shown in Figure 2 shows the behaviour of actors 'student' and 'administrator', and the functionality of use cases 'interact', 'disseminate information', 'update event', and 'reload the system's API'. The 'student' interacts with the system by commenting, viewing events, liking or disliking events, and clicking the "I'm interested" button. From time to time, the students are also the recipients of the disseminated information from 'administrator'. On the other hand, the 'administrator' interacts with the system by generating reports, adding new organization, new administrator new student leader, and new profane words. It is responsible for the reloading of the system's SMS provider (API) and accepts the requested event from organizer among 'student'. The case 'modify database' is also included in the diagram, as it is the indicator that the users and admin interact with the system. While the system is being used, the database might continually be changed or be modified.

The last phase of the methodology was the *Transition Phase*, where the researchers conducted a demo and surveys in the OSS and MAPA as these are the venues that will use the administrator side



of the system. As for the user and sub-admin side, the researchers conducted another demo and survey among students of the College of Engineering, Architecture, and Fine Arts students, whose sample size through stratified sampling.

The results of the data gathered are presented in a pie chart (see Appendix G). The respondents were based on the targeted venue and the stratified sampling results where CEAFA students were the chosen samples/respondents for this research. The total population of CEAFA as of September 22, 2017 was 896 (The information is from the current President of CEAFA Student Council). The respondents were grouped by student organization having 127 population for UAPSA (United Architects of the Philippines Students Association), 125 for PICE (Philippine Institute of Civil Engineers), 68 for CPESA (Computer Engineering Students Association), 35 for PIIE (Philippine Institute of Industrial Engineers), 32 for START (Student Artists Organization), 18 for CSS (Computer Science Society), 43 for IECEP (Institute of Electronics Engineers of the Philippines), and 448 for CEAFA SC .

After solving for the samples using stratified sampling formula, the results are: UAPSA = 39, including all organizations. The survey taken by the students was similar to the survey the offices had. There were five choices for each question: = 1 indicates “Strongly Disagree”, = 2 indicates “Disagree”, 3 indicates “Neutral”, 4 indicates “Agree”, and 5 indicates “Strongly Agree.”

Results and Discussion

The survey revealed that 61.2% of the students found it easy to navigate the system and 68.7% thought that the system provides concise information about the upcoming events. 71.9% think that using the SMS notification is convenient; 74.8% of the students indicated strongly agree that the texts are readable.

When asked if the interface is appealing to the human eye, 73.4%

PICE = 39, CPESA = 21, PIIE = 13, START = 10, CSS = 6, IECEP = 11, and CEAFA SC = 139. In conducting the demo and survey, the researchers disregarded CEAFA SC for it would only duplicate the subjects as some members of other organizations were also members of CEAFA SC. The margin of error used in solving the problem is 5%. As soon as the sample size had been determined, the researchers conducted a demo and survey, first with the OSS and the MAPA.

Stratified Sampling Formula:

$$n = \frac{\text{TotalPopulation}}{1 + \text{TotalPopulation}(\text{MarginOfError})^2}$$


$$s = \frac{\text{OrganizationPopulation}}{\text{TotalPopulation}} \times n$$


After the system was demonstrated to the offices, the researchers conducted another demo and survey among the students of CEAFA



indicated strongly agree and 19.4% thought for agree (see Appendix F). Majority of the students think that the SMS notification and the adding of events module/form are functional. The generated reports of the system are concise and easy to understand for 67.6% of the students.


The researcher reached the goal and met the following:

1. Reach the students through SMS notification;
2. Enable the students to react in a form of “thumbs up or thumbs down” button and give comments about the event; and
3. Allow the administrators would produce administrative reports about events.


USTL e-Bulletin












Welcome,
Phlegm


Event Report


 Home


 Profile

 Administrations

 Approve Events

 Tables

 Activities

 Generate Report

Event Name

Department

Organization

Likes

Dislikes

Interested Members

Public 101: Data and Clouds

CISE

Phlegm AG

0

0

0

Human-Behavior Analysis: The Basics

CISE

AUL Psychology Society

0

0

0

Licensing Computer Tech net

CISE

CISE RC

0

0

0

phlegmrcs 2017: Accounting Basics

CISE

Junior Philippine Institute of Accountants

0

0

0

Block Textures On Board

CBAIA

USTL Student Society

0

0

0

CBAIA vs CBAIA: A basketball fan-on game

CBAIA

CBAIA BC

0

0

0

CBAIA-RWOT: Year 2

CBAIA

CBAIA

0

0

0

AUL Programming competition

CEATA

Computer Science Society

0

0

0

Networking 101: The Basics

CEATA

Computer Engineering Students Association

1

0

0

World Pharmacy Day Celebration

DHS

Junior Philippine Pharmacists' Association

0

0

0

Innovation in Medicine Technologies

AUL

AUL Medicine Society

0

0

0

Interpersonal Team Meeting

DHS

DHS RC

0

0

0

Interpersonal Accounting Curriculum

UNC

Summit Student Council

0

0

0

University Walks Press Conference

USO

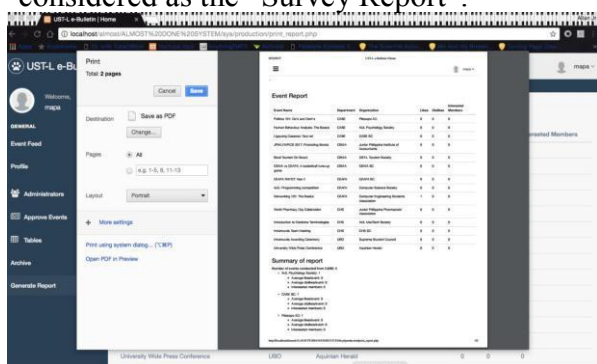
Aquatic World

0

0

0

The researchers developed an application that can generate a printable report about events conducted. It includes the like percentage, dislike percentage, and interested members percentage. The administrative report can be considered as the “Survey Report”.



The Administrative Report also includes the name of the events and the organizations requested and conducted the events.

Before sending an SMS notification, the administrator (MAPA) must review first the content of the system to verify that the event is existing. It is to ensure that the announcements are legitimate.



The system uses Semaphore as the Third party API to handle the sending of SMS notification into the students. The researchers use this API for its easy-to-use feature.



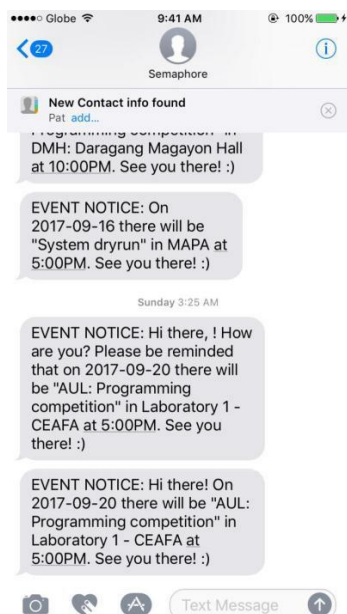


Fig. 7. Screenshot from a user's phone receiving the notification

Once the event has been accepted by the administrator the following SMS notification will be sent with the format as shown above.

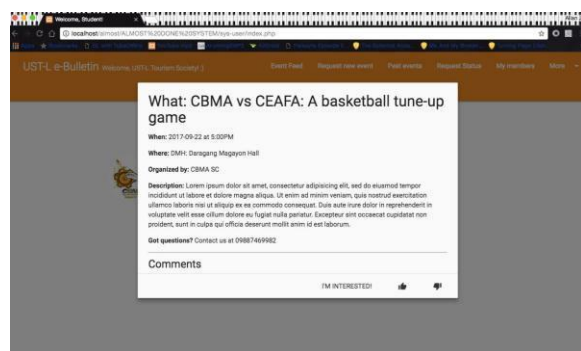


Fig. 8. Screenshot of an Event's Module for users to interact with, like and dislike button, I'm interested button

Aside from receiving SMS notification, the student can also browse the feed of upcoming events sorted by department as shown above. They can like or dislike the event. An "I'm interested" button will be shown to the student where participation is required.

The growing prevalence of web-based applications may have influenced the UST-

Legazpi students to rely on the convenience of technology. Based on the results, majority of the students thought that the implementation of the system would be of help and would make a difference in how they are informed regarding the events.

Recommendations

For future researchers, the system only caters to the sending of SMS notifications to the students but lacks provision for handling an interrupted connection. A module can be developed to handle the sending of SMS when the connection is lost. Also, modules on improving the detection of profane words then automatically importing it into the library and the dissemination of information regarding the upcoming events via email may be explored. The researchers perceived the possibility that the system can be upgraded with more functions and can also be used as a module.

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