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# Voting via Information and Communications Technology Operations and Recreating Initiative into a Newest Online Solution (Victorino's) Quick Election System for GNHS-ABM Society

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*Abstract— The study's goal is to investigate the feasibility of developing an electronic voting system for the Gumaca National High School – Accountancy, Business, and Management (GNHS-ABM) Society via Information and Communication Technology (ICT) operations that can automate the election process and serve as an alternative venue for continuing to work in a new, normal way. The population consists of 422 ABM students, and the sample was selected using the most convenient sampling technique, which yielded 129 respondents. It utilizes quantitative approach and a descriptive research method. An online form containing a 15-item self-made questionnaire was used to collect the data. For necessary statistical treatments such as descriptive and inferential statistics, normality tests, and reliability tests, Microsoft Excel and SPSS were used. According to the findings of the study, active participation is achieved by younger strata and is dominated by lower grade and female groups. In this study, the gadget exposure reveals a key aspect with a gap to consider while the overall perception agreed to the benefit of electronic voting method. Hypothesis testing revealed that all grouping variables has a p-value greater than 0.05 showing no significant difference exist and it fails to reject null hypothesis. Following the proposed intervention, the researcher suggests that the voting process be recreated. Make digital technology more accessible to students and give ample infrastructure support for students to use in order to close the gap between gadget exposure and digital transformation maximized.*

*Keywords— automated election system, electronic voting, information and communications technology, remote voting*

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## I. INTRODUCTION

All schools are encouraged to use the automated election system by the Department of Education (DepEd). The offices of the Regional Education Support Services Division (ESSD) and the Regional Youth Formation Focal Person have been directed to conduct automated elections along with Synchronized Supreme Pupil Government (SPG) and Supreme Student Government (SSG) elections beginning in School Year 2020-2021 and continuing thereafter.

The Gumaca National High School – Accountancy, Business and Management (GNHS-ABM) Society, in the same way, the student organizations reorganize their structures every school year. That organizations are mandated to hold an election. They elected a new set of officers who will be in charge of their year-round activities. Despite the advancement of technology, the traditional and manual method of election is still a

prevalent approach, the use of traditional paper and pens, and sometimes just raising hands. The student Commission on Election (COMELEC) is usually established and recognized as an independent body to conduct the entire electoral process, including; policy formulation, acceptance of nominations, casting, canvassing, proclamation of winning candidates, and handling of protests. This is a long and tiring process, as the body is a group of students with different academic responsibilities. People behind the electoral process are looking for efficient, cost-effective and automated options.

The advancement of Information and Communications Technology (ICT) has resulted in the evolution of the election process. The new method of casting and canvassing votes is through the use of online equipment and electronic gadgets. These online resources are capable of recording words, numbers, time and date, images, hyperlinks, and many more. All data is collected and recorded in real time on an online spreadsheet, an application with the ability to perform automatic calculations and analytics. The beauty of the automated election can be controlled remotely. The system ensures an effective, secure, and automatic presentation of results in real-time data, eliminating borders and without compromising the health of all concerned in this time of pandemic.

## II. METHODOLOGY

In general, the study described situations using a quantitative approach and a descriptive research method. The population sample was determined using the most convenient sampling technique. ABM students are the study's respondents or population. The data's source was primarily determined by the population's response. To reduce physical contact, the study used a self-created questionnaire to collect information, and the collection process was done electronically. Among the 422 ABM students enrolled, the data collection was able to collect 129 respondents. Due to the limitations of existing health protocols for preventing virus spread, the convenient sampling technique was used. No participant has been forced to reveal information that the participant does not wish to reveal. The participants' privacy and confidentiality are also highly valued. The data collected is used to measure variables, statistical treatments such as frequency, percentage, weighted mean, and the Kruskal Wallis Test were used. Testing hypotheses or correlation has been performed to establish relationships between variables. The tabulation and interpretation of data, Microsoft Excel and SPSS were used. The normality test was used to determine the distribution of data and to identify the data's nature as non-parametric.

## III. RESULTS AND DISCUSSION

TABLE I  
DEMOGRAPHIC PROFILES OF THE RESPONDENTS

Age Group	Frequency	Percent
16-17	75	58.1
18-19	50	38.8
> 20	4	3.1
Total	129	100
Sex	Frequency	Percent
Male	47	36.4
Female	82	63.6
Total	129	100
Grade	Frequency	Percent
Grade 11	82	63.6
Grade 12	47	36.4
Total	129	100
Gadget Exposure	Frequency	Percent
Low	19	14.7
High	110	85.3
Total	129	100

Table1 shows the respondents' demographic profile in terms of age, sex, grade, and gadget exposure. More than half of the participants are between the ages of 16 and 17, and nearly two-thirds of the respondents are female students. Grade 11 outnumbers grade 12 by nearly double, and the ratio of gadget exposure among participants is 85:15. These suggest that active participation achieved from the younger strata of the population, also dominated by lower grade and female group. The higher gap between gadget exposure could be a critical factor to consider in this study. Comparing the results to recent report, Vogels (2020) in her article "Millennials

stand out for their technology use, but older generations also embrace digital life” from the website “Pew Research Center” found that 9 out of 10 younger generation owned a smartphone as compare with older generation, and ready to adopt the use of digital technology.

TABLE III  
THE LEVEL OF RESPONDENTS' PERCEPTION OF RECREATING THE TRADITIONAL METHOD OF ELECTION THROUGH ICT TO ELECTRONIC VOTING METHODS

Item	Perceptions	Mean	Rank	Verbal Interpretation
1	I am sure that the electronic method is an acceptable innovation for the election.	3.24	5	Agree
2	I believe that the electronic method of election can eliminate boundaries, such as difficulties in writing.	3.19	9	Agree
3	I can easily select my chosen candidate using an automated election method.	3.28	3	Strongly Agree
4	I am motivated to participate and exercise the right to vote using an automated voting method.	3.23	7	Agree
5	I feel that my votes were recorded and counted correctly through the automated system.	3.22	8	Agree
6	I am confident that the use of ICT equipment is an enjoyable and convenient election experience.	3.33	1	Strongly Agree
7	I think that post-election time/activities would be reduced.	3.24	5	Agree
8	I am convinced that the results of automated elections are computed electronically and automatically.	3.25	4	Agree
9	I am confident that the election processes were efficient, fast and accurate.	3.18	11	Agree
10	I believe it has a flexible capability, any devices with internet browser can be used.	3.19	9	Agree
11	I am positive that the system reduces the use of resources such as manpower, papers, pens, and money.	3.3	2	Strongly Agree
12	I am certain that error of votes or spoiled ballots shall be eliminated.	3.08	14	Agree
13	I am determined that the system promotes and protects the confidentiality of votes.	3.18	11	Agree
14	I am confident that election records are stored in the cloud and can be accessed anywhere and at any time.	3.08	14	Agree
15	I am convinced that the system has an audit function that promotes transparency.	3.17	13	Agree
	<i>Average Mean</i>	3.08		Agree

Legend: 1.0-1.75=Strongly Disagree, 1.76-2.50 = Disagree, 2.51-3.25 = Agree, 3.26-4.00 = Strongly Agree

Table 2 shows that the respondents' perception of recreating the traditional method of election through ICT to electronic voting methods falls with a minimum mean rank of 3.08 and a higher mean rank of 3.33, translating the average participant's acceptance to agree in each domain. The mean suggests the population's concurrence to the benefit of electronic voting method. The result was congruent to available literature and studies summarizes the benefits of online voting. The conduct was fast, easy and affordable, it also maximizes participations, saves time with ease vote management, environment friendly, and it is private & secure. All are parallel to the study of Sawyerr (2015) the result of his research shows that the automated election system has a greater advantage. The same finding found on the study of Quist et al. (2016) when compared the paper balloting method of voting, the online voting system was a better, more effective, provide without distance barrier, and more efficient way of voting option.

TABLE IIIII  
THE LEVEL OF SIGNIFICANT DIFFERENCE BETWEEN THE RESPONDENTS' PERCEPTION OF RECREATING THE TRADITIONAL METHOD OF ELECTION THROUGH ICT TO ELECTRONIC VOTING METHODS ACCORDING TO THEIR AGE, SEX, GRADE, & GADGET EXPOSURE

Grouping Variables	df	Kruskal-Wallis H	p-value	Decision	Remarks
The level of significant difference between the respondents' perception of recreating the traditional method of election through ICT to electronic voting methods according to their age.	2	0.0621	0.733	Accept Ho	No Significant Difference Exist
The level of significant difference between the respondents' perception of recreating the traditional method of election through ICT to electronic voting methods according to their sex.	1	0.332	0.564	Accept Ho	No Significant Difference Exist
The level of significant difference between the respondents' perception of recreating the traditional method of election through ICT to electronic voting methods according to their grade.	1	0.041	0.84	Accept Ho	No Significant Difference Exist
The level of significant difference between the respondents' perception of recreating the traditional method of election through ICT to electronic voting methods according to their gadget exposure.	1	0.852	0.356	Accept Ho	No Significant Difference Exist

a. Kruskal Wallis Test b. Grouping Variable: Grade \*Significant at  $\alpha=0.05$

Table 3 shows the level of significant difference between the respondents' perception of recreating the traditional method of election through ICT to electronic voting methods according to their demographic profiles using Kruskal Wallis Test. To test for significant difference, it is accounted that the null hypothesis states that the level of perception of the respondents across groups is not significantly different. Using the p-value method, the null hypothesis is rejected whenever the p-value is less than or equal to the significance level. Otherwise, if the p-value is exceeded the level of significance, then it fails to reject Ho. The data revealed that all grouping variables has a p-value greater than 0.05 showing no significant difference exist and it fails to reject Ho. The results indicating the significant difference between student's perception and across grouping variables signifying no relationship and it indicates the readiness of that generation for the benefit of ICT transformation. The action from the DepEd through its OUA Memorandum Number 01-0120-0609, dated January 30, 2020, to implement an Automated Election for student organization was in consonance and valid. The study of Suprianto (2020) also support to these findings, it found that people who always up to date with the technology can bring response and participation increasing. It contributes for effective and efficient both material and moral innovation able to stimulate students to practice their voting rights.

#### IV. CONCLUSIONS

1. A higher proportion of respondents clinging to ICT necessitates greater democratization of digital technology to bridge the gap between gadget exposure and digital transformation.
2. The findings and discussions provided sufficient information to proceed with the implementation of the cited perceptions.
3. The GNHS-ABM Society was ready to initiate the entire voting process automatically and electronically by utilizing ICT features.
4. The roadmap to recreate an election method capable of automatically computing data is the type of system that the population desires.

#### V. RECOMMENDATIONS

1. The suitability of the remote election system was favorable due to the respondents' high exposure to gadgets, particularly among the younger strata.
2. Positive perceptions and population concurrence to recreate election methods are encouraging signs of change that will benefit stakeholders of electronic voting methods.
3. The results indicate the readiness of young generation to recreate election methods from the benefit of ICT transformation.
4. The study suggests to recreate the traditional method into ICT enabled election method.

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### APPENDICES

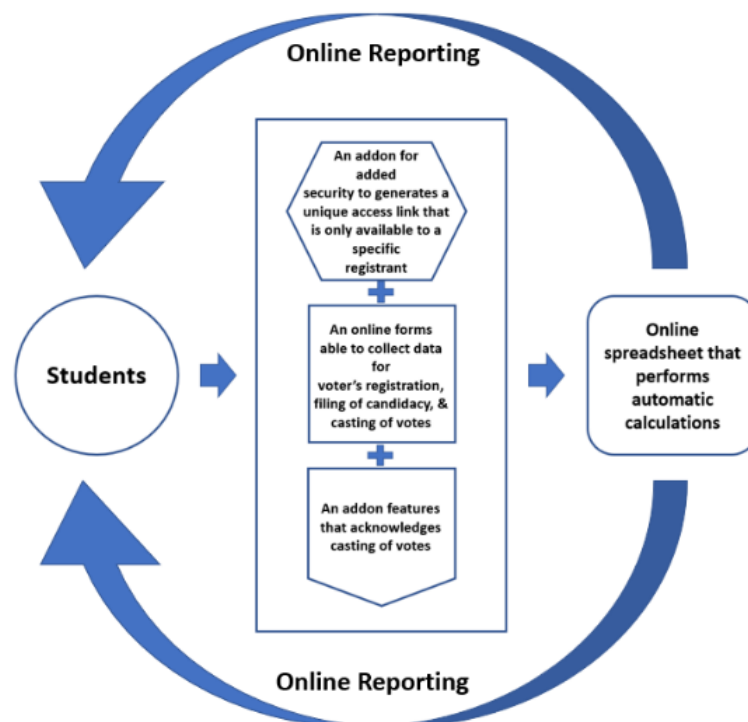


Figure 1: The Concept of VICTORINO'S Quick Election System for GNHS-ABM Society

**Proposed intervention**

It is recommended that the student COMELEC prepare the system using this guide covering the election period.

Activity	Action	Involved
1. Organize the COMELEC	Each class selects two representatives, they will elect the Chairperson and Vice Chairperson, as well as the necessary committee. They will develop policies related to election implementation in the ABM Society.	ABM students
2. Voters Registration	The COMELEC can collect student profiles such as name, gender, grade, section, valid email address, and contact number using an online form with an integrated spreadsheet, which serves as the basis for the official voter list. The generated link will serve as a portal and must be shared with the students in order for them to gain access. The collected data could be compared to a list of enrollments per class or section to perform data validation.	COMELEC's Committee on Registration
3. Filing a Certificate of Candidacy	After disseminating information, the COMELEC can accept Certificates of Candidacy (COC) online by using an online form with an integrated spreadsheet. The necessary data, such as the candidate's name, grade and section, government platform, photo, and other relevant information required in the certificate of candidacy, shall be collected. That information could be linked to a preformatted Certificate, which automatically generates a pdf file for approval, which could be printed or electronically signed. The generated link will serve as a portal and must be shared with the students in order for them to gain access.	COMELEC/Student applicants
4. Casting of votes	Following the completion of the COC filing, the COMELEC may begin designing an online voting system using an online form with an integrated spreadsheet. The online form, which serves as a data collection tool, must be redesigned for the purpose. The online form used as an online voting system can include the candidate's position, full name, and image. To secure votes and avoid duplicate votes, an add-on application could be used to generate a personalized link that is only intended for a specific voter's registrant and is sent to their registered email address. An additional process flow could be added to acknowledge the casting of votes via SMS.	COMELEC and Students
5. Canvassing of Votes	Automatic calculations are possible with the integrated online spreadsheet. By utilizing its functions, it is able to automatically fetch each voter's vote for a specific candidate. The spreadsheet requires some fine tuning, such as the creation of an additional worksheet to create a pre-designed board to insert necessary functions and perform calculations from raw data. Depending on the COMELEC's policies, the link could be shared to view real-time vote counting.	COMELEC
6. Proclamation of winning candidates	The COMELEC announces the newly elected officers.	COMELEC, newly elected officers, advisers, students