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**Research Paper**

# The acceptability of generative AI tools of selected senior high school teachers in schools divisions office-Manila, Philippines

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**ABSTRACT**

This study focuses on the acceptability of selected Senior High School teachers on the use of generative AI tools, particularly Microsoft Bing Chat. A one-shot case study design was conducted on schools across six (6) districts in Manila Philippines. Both the voluntary response sampling method and Slovin's formula were used to determine the sample from the population. This study involved 125 senior high school teachers, 54 or 43% of whom were males and 71 or 57% of whom were females from both private and public senior high schools in Manila City. The data were recorded first in an MS Excel program and later transferred to SPSS for analysis and visualization. The research instrument was administered online using Google Forms and then transferred to SPSS for data analysis and statistical treatment. It was revealed that all factors were statistically significant on the acceptability of generative AI tool by senior high school teachers. Furthermore, self-efficacy (SE) has the highest of 0.824 coefficient value followed by the factor perceived ease of use (PE) of 0.812 indicating their influence on Bing Chat behavioural intention of use (BI), leaving attitude (AT) the lowest among five (5) factors with 0.762 coefficient value. This implies that senior high teachers in Manila are much willing to abreast the idea of including generative AI tools in promoting their productivity in the workplace.

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## 1. INTRODUCTION

Artificial Intelligence (AI) has gradually entered our daily routines, from the technology powering our smartphones to self-driving car capabilities to the tools shops employ to surprise and please customers. Work automation, when combined with all other technologies, might bring 0.20 to 3.30 percentage points to annual productivity increase [1]. ChatGPT, Bing Chat, GitHub Copilot, Stable Diffusion, and other generative AI applications have captivated the attention of people all over the world [2]. Microsoft's Bing Chat is free as it can accept any queries, use large language model (LLM), and has the capability to understand and reply in human language [3].

Academic institutions, for instance, have started crafting rules and held discussions to take into account the emergence of AI-written research and papers [4]. Additionally, generative AI has the potential to improve student learning results. Increasing school education availability and quality will help to secure opportunities for future scientists and researchers which will ultimately lead to future technological advances [5]. Furthermore, there was a dearth of research suggesting that generative AI tools such as Bing Chat were widely embraced by senior high school instructors, particularly in Manila, as a means of assisting them in fulfilling their teaching jobs and needs. The most influential, most tested, and best-operationalized method on the potential impact on the acceptance of information systems is the Technology Acceptance Model (TAM) [6]. Recent studies have used the TAM in the field of education [7], [8] autonomous vehicles [9], virtual reality [10], even telemedicine [11].

In this paper, the authors investigated the acceptability of Generative AI tools in the context of Senior high school teachers teaching performance in the Division of Manila, Philippines. It aims to provide inputs to educators, head teachers, principals, and district supervisors with implications for better application of generative AI tools.

In light of the research gaps, this study attempts to determine "The acceptability of Generative AI Tools of Selected Senior High School Teachers in SDO-Manila, Philippines." Specifically, it sought to answer the following research questions:

1. Senior High School Teachers' behavioural intention to use generative AI tools is affected by their attitude (H11), perceived usefulness (H12), perceived ease of use (H13), self-efficacy (H14), subjective norm (H15), and system accessibility (H16).
2. Senior High School Teachers' generative AI tool attitude is affected by their perceived usefulness (H21), perceived ease of use (H22), self-efficacy (H23), subjective norm (H24), and system accessibility (H25).
3. Senior High School Teachers' perceived usefulness of generative AI tools is affected by their perceived ease of use (H31), self-efficacy (H32), subjective norm (H33), and system accessibility (H34).
4. Senior High School Teachers' perceived ease of use of generative AI tools is affected by their self-efficacy (H41), subjective norm (H42), and system accessibility (H43).

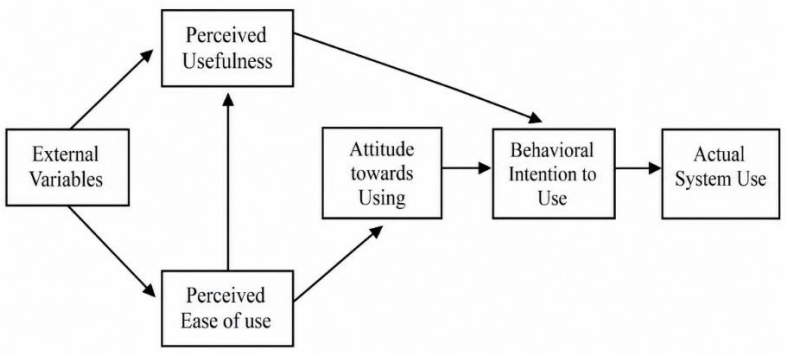


Figure 1. Technology Acceptance Model

To examine and explain how and why senior high school teachers accept or reject Bing Chat tool and specifically to infer the impact on them, the Technology Acceptance Model (TAM) was used in this study as a research framework shown in Figure 1.

## 2. METHODOLOGY

### 2.1 Research Design

This paper employs a one-shot case study in attaining a quantitative analysis of the acceptability of senior high school teachers in using Bing Chat. Data were collected through an online survey using Google Forms that was administered in different schools to accomplish.

### 2.2 Participants and Sampling

This study aims to investigate the acceptability of senior high school teachers of the Bing Chat application. A voluntary response sampling method was employed with a total of 125 participants (54 males and 71 females) both from private and public senior high schools in Manila City participated. Slovin's Formula was used to calculate the sample size of 95.24 from the result of the survey, given the population size of 125 and a margin of error of 0.50.

### 2.3 Research Instrument

The instrument was developed by the authors based on both studies of Park [12] and Revythi & Tselios [13]. Content reliability via Cronbach's Alpha (α) was measured on the curated instrument with 125 senior high school teachers across six (6) districts in Manila. The completed instrument consisted of six (6) sections. The questionnaire mainly comprises closed-ended multiple-choice questions and its objective is to assess the acceptance of a generative AI tool, particularly the Bing Chat web application. The first part asks the participants about their demographics. The second part of the instrument comprised 18 questions about the acceptance of the generative AI tools platform, which are based on the key variables of an extended TAM with appropriate configuration factors for the platform, and finally responses to the systems given in the Likert scale.

### 2.4 Ethical Considerations

The authors sought assistance from the Department of Education Schools Divisions Office of Manila in the validation of the research instrument and letter of consent to conduct research. This was also administered in selected senior high schools in six (6) districts of Manila with the help of both the public schools district supervisors (PSDS) and school heads.

### 2.5 Data Gathering Procedure

Participation in the study was voluntary and the completion of the questionnaire took place online via answering Google Forms prepared by the authors. In particular, one of the authors wrote the goals of the study while introducing the questionnaire to the participants. The process of filling out the evaluation lasted approximately 10–15 minutes.

### 2.6 Statistical Treatment

Data collected by the questionnaire were coded by the authors. The data were recorded first in an MS Excel program and later transferred to SPSS for analysis and visualization. Descriptive statistical analyses such as mean, standard deviation, frequency, percent, and correlation were implemented using both MS Excel and SPSS. Lastly, Structural equation modelling (SEM) was used to test the hypotheses.

## 3. RESULTS AND DISCUSSION

Table 1. Demographic Profile of the Sample

| Variables | Number (N) | Percentage (%) |
|---|---|---|
| **Age** | | |
| 20–30 | 45 | 36.00 |
| 31–40 | 37 | 29.60 |
| 41–50 | 26 | 20.80 |

| | | |
|---|---|---|
| 51 and above | 17 | 13.60 |
| **Gender** | **Number (N)** | **Percentage (%)** |
| Male | 54 | 43.20 |
| Female | 71 | 56.80 |
| **Length of Service** | **Number (N)** | **Percentage (%)** |
| 5 years under | 56 | 44.80 |
| 6–10 years | 36 | 28.80 |
| 11–15 years | 13 | 10.40 |
| 16–20 years | 6 | 4.80 |
| 21–25 years | 5 | 4.00 |
| 26–30 years | 4 | 3.20 |
| 31 years and above | 5 | 4.00 |
| **Highest Educational Attainment** | **Number (N)** | **Percentage (%)** |
| Doctorate Degree | 10 | 8.00 |
| Master's Degree | 50 | 40.00 |
| Bachelor's Degree | 65 | 52.00 |
| **Subjects Taught** | **Number (N)** | **Percentage (%)** |
| Science | 14 | 11.20 |
| Mathematics | 17 | 13.60 |
| Physical Education and Health | 14 | 11.20 |
| Media and Information Literacy | 9 | 7.20 |
| Filipino | 19 | 15.20 |
| English | 19 | 15.20 |
| Research | 14 | 11.20 |
| Computer | 19 | 15.20 |

As shown in Table 1, the majority of the respondents are 45 or 36.00 percent were aged between 20–30 years senior high school teachers among the 125 respondents who are used as the subject of the study. As reflected in the data, most of the respondents were female with 71 or 56.80 percent. It can be noted that in terms of length of service, five (5) years under has the highest number equivalent to 44.80 percent or 56 of the total respondents. Furthermore, in terms of highest educational attainment, bachelor's degree was dominated with 65 or 52 percent. Meanwhile, Filipino, English and computer subjects got the greatest number or equivalent to 15.20 percent among the senior high school teachers subject taught

Table 2. Computer and Internet-related Skills

| **Do you have computer access at home?** | **Number (N)** | **Percentage (%)** |
|---|---|---|
| Yes | 116 | 92.80 |
| No | 9 | 7.20 |
| **Do you have Internet access at home?** | **Number (N)** | **Percentage (%)** |
| Yes | 125 | 100.00 |
| No | 0 | 0.00 |
| **Computer Skills** | **Number (N)** | **Percentage (%)** |
| Not skilled | 5 | 4.00 |
| Beginner | 7 | 5.60 |
| Intermediate | 55 | 44.00 |
| Advanced | 12 | 9.60 |
| Expert | 46 | 36.80 |
| **Internet Skills** | **Number (N)** | **Percentage (%)** |
| Not skilled | 5 | 4.00 |
| Beginner | 9 | 7.20 |

| | | |
|---|---|---|
| Intermediate | 52 | 41.60 |
| Advanced | 48 | 38.40 |
| Expert | 11 | 8.80 |
| **Awareness on Generative AI Tools?** | **Number (N)** | **Percentage (%)** |
| Yes | 78 | 62.40 |
| No | 47 | 37.60 |
| **How often do you use Generative AI tool in your school?** | **Number (N)** | **Percentage (%)** |
| Never | 20 | 16.00 |
| Occasionally | 43 | 34.40 |
| Frequently | 25 | 20.00 |
| Always | 37 | 29.60 |
| **Chat GPT** | **Number (N)** | **Percentage (%)** |
| Never heard of it | 14 | 11.20 |
| I heard it but I don't know how to use it | 27 | 21.60 |
| I know how to use it | 58 | 46.40 |
| I am very knowledgeable about it | 26 | 20.80 |
| **Bing Chat** | **Number (N)** | **Percentage (%)** |
| Never heard of it | 36 | 28.80 |
| I heard it but I don't know how to use it | 42 | 33.60 |
| I know how to use it | 27 | 21.60 |
| I am very knowledgeable about it | 20 | 16.00 |
| **Google Bard** | **Number (N)** | **Percentage (%)** |
| Never heard of it | 63 | 50.40 |
| I heard it but I don't know how to use it | 42 | 33.60 |
| I know how to use it | 16 | 12.80 |
| I am very knowledgeable about it | 4 | 3.20 |

Table 2 manifests the respondents as to their computer and internet related skills. As manifested in the data, there are 116 or 92.80% have access to computer at home. Surprisingly, 125 or 100% of the respondents were able to access internet at home. Similarly, there were 55 or 44% of the respondents were intermediate users as to computer skills. Likewise in terms of internet skills 52 or 41.60% of the respondents were intermediate users.

It can also be gleaned that the awareness on Generative AI tools (Chat GPT, Bing Chat, GitHub CoPilot, Google Bard, etc), 78 or 62.40% were aware. Furthermore, there were 43 or 34.40% that Generative AI tool were used occasionally in the workplace or school. Finally, Chat GPT got the highest number of users in terms of technical know-how.

The internal reliability of the instrument was measured using Cronbach alpha of 0.985 among 125 senior high school teachers. Factor loading of each item was conducted after the data was transferred to IBM SPSS tool as a spreadsheet file.

Table 3. Factor loading and Cronbach Alpha Results

| Item | μ (Mean) | σ (SD) | Factor Loading | Cronbach Alpha (α) | Item | μ (Mean) | σ (SD) | Factor Loading | Cronbach Alpha (α) |
|---|---|---|---|---|---|---|---|---|---|
| E1 | 3.45 | 1.103 | 0.803 | 0.984 | A1 | 3.39 | 1.023 | 0.770 | 0.985 |
| E2 | 3.38 | 1.113 | 0.775 | 0.985 | A2 | 3.39 | 1.039 | 0.778 | 0.985 |
| E3 | 3.34 | 1.107 | 0.821 | 0.984 | A3 | 3.43 | 1.065 | 0.753 | 0.985 |
| U1 | 3.31 | 1.103 | 0.796 | 0.985 | SE1 | 3.30 | 1.047 | 0.830 | 0.984 |
| U2 | 3.35 | 1.094 | 0.826 | 0.984 | SE2 | 3.29 | 1.099 | 0.826 | 0.984 |
| U3 | 3.35 | 1.116 | 0.818 | 0.984 | SN1 | 3.26 | 1.069 | 0.720 | 0.985 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| B1 | 3.27 | 1.103 | 0.847 | 0.984 | SN2 | 3.26 | 1.062 | 0.848 | 0.984 |
| B2 | 3.29 | 1.069 | 0.829 | 0.984 | SA1 | 3.23 | 1.108 | 0.776 | 0.985 |
| B3 | 3.32 | 1.119 | 0.778 | 0.985 | SA2 | 3.23 | 1.101 | 0.834 | 0.984 |

Table 3 shows the result of factor loading of constructs and internal validity of the instrument. Cronbach Alpha (α) values greater than 0.70 are deemed satisfactory. Interestingly, their coefficient alpha values are either 0.984 or 0.985, indicating internal consistency.

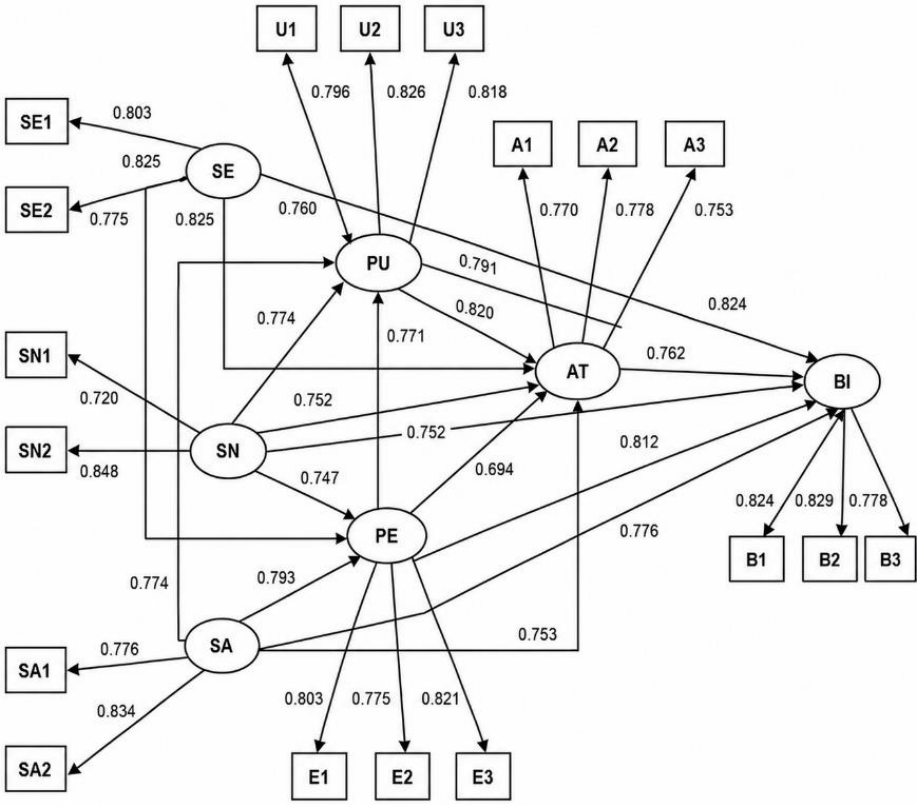


Figure 2. Factor Loading, and Parameter Estimates of the General Structural Model

To build the model shown in Figure 2, the bootstrapping procedure (two-tailed test) and an analysis of t-statistics values (significance level p 0.05 and t-statistics >1.96) were used. With regard to the data acquired, it was discovered that all of the relationships are statistically significant and have strong effects. Furthermore, self-efficacy (SE) has the highest of 0.824 coefficient value followed by the factor perceived ease of use (PE) of 0.812 indicating their influence on Bing Chat behavioural intention of use (BI), leaving attitude (AT) the lowest among five (5) factors with 0.762 coefficient value.

Table 4. Parameter Estimates and Results of Hypotheses

| Factor Relationship | Direct Effect | P-Value | Result of Hypothesis |
|---|---|---|---|
| AT → BI (H11) | 0.762** | 0.000 | Supported |
| PU → BI (H12) | 0.791** | 0.000 | Supported |
| PE → BI (H13) | 0.812** | 0.000 | Supported |
| SE → BI (H14) | 0.824** | 0.000 | Supported |
| SN → BI (H15) | 0.752** | 0.000 | Supported |
| SA → BI (H16) | 0.776** | 0.000 | Supported |
| PU → AT (H21) | 0.820** | 0.000 | Supported |
| PE → AT (H22) | 0.694** | 0.000 | Supported |
| SE → AT (H23) | 0.745** | 0.000 | Supported |

| | | | |
|---|---|---|---|
| SN → AT (H24) | 0.744** | 0.000 | Supported |
| SA → AT (H25) | 0.753** | 0.000 | Supported |
| PE → PU (H31) | 0.771** | 0.000 | Supported |
| SE → PU (H32) | 0.760** | 0.000 | Supported |
| SN → PU (H33) | 0.774** | 0.000 | Supported |
| SA → PU (H34) | 0.774** | 0.000 | Supported |
| SE → PE (H41) | 0.825** | 0.000 | Supported |
| SN → PE (H42) | 0.747** | 0.000 | Supported |
| SA → PE (H43) | 0.793** | 0.000 | Supported |

The results of both comparison and direct effects of each item obtained were summarized in Table 4. The four hypotheses were confirmed with their respective coefficient value of influence on another item. All hypotheses on the acceptability of Bing Chat tool have statistically significant effects and were supported. It can be gleaned from the table that the effects of all items were very strong, having a p-value of 0.000. The result does not represent that same outcome of each hypothesis found on the study of Park [12], [13] mainly due to their intervention medium was on e-Learning applications that was checked for acceptability.

## 4. CONCLUSION

This paper concluded that all factors in the research instrument were evidently statistically significant in the acceptability of the Bing Chat application. This implies that senior high teachers in Manila are much willing to abreast the idea of including generative AI tools in promoting their productivity in the workplace. Despite the fact that the authors followed the method for conducting an acceptability study, the results differed depending to the context of technology being observed.

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### Author Contributions Statement

| Name of Author | C | M | So | Va | Fo | I | R | D | O | E | Vi | Su | P | Fu |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Angelo C. Arguson | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ | | | |
| Marvin P. Mabborang | | ✓ | | | | ✓ | ✓ | | | | ✓ | ✓ | | ✓ |
| Rhonnel S. Paculanan | ✓ | | | ✓ | ✓ | | | ✓ | | ✓ | | ✓ | | |

C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo : **Fo**rmal analysis
I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

### Conflict of Interest Statement

The authors declare that there are no conflicts of interest regarding the publication of this paper.

### Informed Consent

All participants were informed about the purpose of the study and their voluntary consent was obtained prior to data collection.

### Ethical Approval

Not applicable.

### Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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