# TECHNOLOGY RESEARCH MANAGEMENT: ITS INFLUENCE ON THE ENGAGEMENT OF ELEMENTARY SCHOOL TEACHERS IN ZAMBOANGA CITY

**Joan C. Tinaytina, PhD**

Tetuan Central School, Zamboanga City Schools Division, Zamboanga Peninsula, Philippines
Zamboanga Peninsula Polytechnic State University, Zamboanga City, Philippines

**DOI**: https://doi.org/10.56293/IJASR.2024.5905

**IJASR 2024**
**VOLUME 7`**
**ISSUE 3 MAY – JUNE** **ISSN: 2581-7876**

**Abstract:** This study aimed to determine the level of technology research management among elementary teachers of Zamboanga City and its significant influence on their research engagement. Furthermore, it sought to figure out the significant difference between elementary teachers' technology research management and research engagement as the data is compared based on their sex, generation, position, and years of engagement as a researcher on their schools' research projects. It tried to find out the challenges met by elementary teachers regarding technology research management. Moreover, this study gathered 159 elementary teachers who have involvement in schools' research projects across Zamboanga City who were selected through a purposive sampling method to share their technological managerial practices in research and their engagement. Also, it employed mixed method design to gain the answers to all aforementioned research problems.

The study examined the relationship between teachers' technological research management and their research engagement. The findings revealed that teachers were moderately skilled in managing technology research and highly engaged in research. The cognitive aspect of research engagement was positively influenced by social media communication, while the behavioral and affective aspects were influenced by technical writing and social media communication. This suggests that teachers' technological research management significantly influences their research engagement. Demographic profiles did not show a significant difference in technological research management and research engagement. However, challenges such as time flexibility, limited resources, lack of competence, and limited opportunity hindered teachers' technology research management and engagement. The study recommends including technology research management and engagement in Schools' Improvement Plans to promote research culture and integrating technology management in schools. It also suggests developing technology research training to enhance teachers' competence and addressing the challenges to encourage educational research in schools, aligning with the vision of the Department of Education.

**Keywords:** technology research management, engagement, elementary teachers

## INTRODUCTION

### Background of the Study

Technology management plays a significant role for schools' administrative staff and teachers in improving the quality of educational services suited to the needs of the school. In this respect, Daim, et al (2010) said that it is necessary to know the basic features of Technology Management. It is useful to highlight two essential structures: the management of technology by field workers like teachers and the management of technology in terms of academic research. Also, it serves as a key for teachers to be more effective, efficient, and reliable in rendering their services towards the schools' needs. In relation to this, Doyle (2020) defines technology management in research as the possession of proficiency and abilities needed to perform various tasks. It involves technical writing, statistical analysis, communication skills and evaluation for the professionals to be more effective, efficient, and reliable in dealing with a various professional and academic task.

The ability for teachers to participate in school policy-making, the creation of strategic plans, educational projects, and programs tailored to the needs of the school is provided by their engagement in research. Engaging in a research journey may be the first move a school can take to raise the standard of its educational services and meet

the needs of the 21st century generation. Along with this, the Department of Education through the DepED Order 16, series of 2017 promotes the culture of research in basic education. Supported with the Republic Act no. 9155 otherwise known as "The Governance of Basic Education Act of 2001" under chapter 1 section 7 paragraph 5 coined as "Educational Research and Studies" emphasized that the department promotes research engagement as one of the bases for decision making Llego (2017).

In this 21st century generation where digital advancement becomes a trend to all teachers in the academe across nationwide, technology research management is one of the relevant key assets serve as a strength for teachers for them to be more motivated to engage in research with respect to the professional quality standards to display integrity, ethicality, and reputable to maintain trustworthiness and reliability of their academic research accomplishment which will be suited to the criteria associated with the guidelines set by the Department of Education (DepED) in Research and Planning theme.

However, there are some factors that affects teachers' technology research management across worldwide despite of emerging trend of advance technology in education. As cited by Patel (2021), budget restriction which was not able them to provide with technological resources for their professional and academic purposes; lack of training and skills enhancement; unstable networks; resistant to embrace technological way of life; and unreliable electronic device and software. Those challenging factors pointed out as a hindrance for teachers to embrace technology management in education. Consequently, it hinders them to engage in research.

Subsequently, the current study urged to determine the extent of technology research management, its significant influence on teachers' research engagement across Zamboanga City Division, and the extent of relevance of technology research management for teachers to be more interested in engaging in research.

The outcome of this study served as a basis for the administration of Department of Education (DepED) to formulate strategic plans in promoting technology research management for teachers to engage in research.

This study aimed to find out the significant influence of technology research management towards research engagement of elementary school teachers in Zamboanga City for school year 2022-2023.

Specifically, it sought to find the answers to the following questions:

1. Determine the level of technology research management of elementary school teachers in terms of:
1.1 technical writing
1.2 data & statistical analysis
1.3 social media communication
1.4 plagiarism tracking
2. Determine the extent of research engagement of elementary school teachers in terms of the following aspect:
2.1 cognitive
2.2 affective
2.3 behavioral
3. Identify the significant influence of teacher's technology research management and their engagement.
4. Determine the significant difference of teachers in technology research management and their engagement when data are clustered according to their sex, position, educational attainment, generation and number of years engaged in research.
5. Determine the significant difference on research engagement of elementary school teachers when data clustered according to their sex, position, educational attainment, generation and number of years engaged in research.
6. Identify the challenges encountered by elementary school teachers in technology research management relevant to their research engagement.

## METHODOLOGY

This study applied mixed method design through correlational and comparative analysis, and qualitative design through phenomenological analysis which served as a blueprint to answer the given research problems. A descriptive design was appropriate to determine the level of teachers' technology research management and their

engagement. On the other hand, quantitative through correlational analysis was also appropriate to track the significant influence of the teachers' technology research management on their engagement.

Moreover, this study utilized comparative analysis through the teachers' sex, generation, position, and educational attainment as a moderating variable served as a basis to determine the significant difference in their technology research management and engagement. Lastly, this study applied a qualitative design through phenomenological analysis to determine, enumerate, and to find out the teachers' challenges encountered along with their technology research management and their engagement.

This study was conducted on the selected elementary schools of the Department of Education (DepED), Zamboanga City Division with teacher-researchers who are also members of the Planning and Research Department of the said division. The said department consists of 270 total number of teacher-researchers across any qualification from 29 public elementary schools of Zamboanga City Division coded as School A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R,S,T,U,V,W,X,Y,Z,A1,B1,C1 and they were also under the supervision of Ms. Janekin V. Hamoc, Senior Educational Program Specialist of the abovementioned department.

The locations were selected for knowing the efficiency of data gathering. The study will be centered on describing the level of technology research management and its influence on teachers' engagement. This study will also identify the challenges encountered relevant to the research engagement of elementary school teachers in technology research management.

Population and Respondents of the Study

The target respondents of this study were the elementary teachers who have involvement for the on-the-process, or completed the conduct of DepED Research under the Research & Planning Department (RPD) directed by the Department of Education – Zamboanga City Division (DepED-ZCD) across any profile who will share their responses pertaining to their technology research management, their engagement, and the challenges encountered along with their research engagement.

Population and Samples of the Study

The target population of this study were the elementary teacher-researchers of 29 public elementary schools of the entire Department of Education, Zamboanga City Division.

**Table 1: Population and Respondents Distribution by School**

| School | N | n | N | % |
|---|---|---|---|---|
| A | 139 | | 7 | 5.03 |
| B | 78 | | 4 | 5.12 |
| C | 92 | | 4 | 4.34 |
| D | 115 | | 14 | 12.17 |
| E | 106 | | 10 | 9.43 |
| F | 29 | | 2 | 6.89 |
| G | 99 | | 9 | 9.09 |
| H | 42 | | 2 | 4.76 |
| I | 90 | | 2 | 2.22 |
| J | 54 | | 4 | 7.40 |
| K | 91 | | 12 | 13.18 |
| L | 116 | | 14 | 12.06 |
| M | 178 | | 8 | 4.49 |
| N | 31 | | 4 | 12.90 |
| O | 108 | | 1 | 0.92 |
| P | 56 | | 5 | 8.92 |
| Q | 36 | | 5 | 13.88 |
| R | 115 | | 5 | 4.34 |
| S | 63 | | 3 | 4.76 |
| T | 52 | | 6 | 11.54 |
| U | 57 | | 2 | 3.50 |
| V | 120 | | 9 | 7.5 |
| W | 45 | | 3 | 6.67 |
| X | 49 | | 6 | 12.24 |
| Y | 30 | | 2 | 6.66 |
| Z | 109 | | 5 | 4.58 |
| A1 | 81 | | 5 | 6.17 |
| B1 | 36 | | 4 | 11.11 |
| C1 | 75 | | 2 | 2.66 |
| TOTAL | 2292 | | 159 | 100% |

Table 1 shows the total population of researchers across any qualification who took part of the Research & Planning Department (RPD) of Department of Education (DepED) whereas, there are 159 total number of researchers who were on-the-process, or completed their research output. Through the use of the purposive sampling technique, the respondents were selected based on the specific qualifications such as those appointed or designated as research evaluator of the school and district of elementary schools of the entire Zamboanga City Division and have their involvement on the abovementioned agenda ,whereas these teacher-researchers are qualified to perform their functions like giving technical assistance to other teacher-researchers who are conducting research studies, making endorsements of research proposals and completed research conducted by other researchers, encouraging teachers to conduct research, planning to come up with trainings and activities in school or district which is relevant to research and as well as report to the school principal the accomplishments made and the status of each teacher-researcher who conducts the study in their respective schools  There were 159 teacher-researchers, and this figure was used for this study.

The Department of Education (DepED) mandates all teachers to be involved in research which will enhance the culture of research in their respective schools, as well as Zamboanga City Division, that qualifies all of them as key respondents for this study. This study applied a purposive sampling design by selecting teachers who are conducting research, whether on-going or completed paper in all public elementary schools under the supervision of Zamboanga City Division of the Department of Education (DepED), and are classified also as a research evaluator directed by the Research & Planning Department (RPD), served as criteria or basis for the selection of the respondents for this study. Moreover, to be qualified as respondents of the study, a teacher is a designated or appointed research coordinator of the school as well as a member of the School Research Committee organized by the school head. Other conditions set to be respondents of the study are teachers of public elementary schools who are actually conducting research studies and has completed their full-blown research with certificate of completion from School year 2021- 2023.

This study developed a researcher's made survey questionnaire which was originally made by the researcher associated with 4-point Likert scale and the statements were anchored from the DepED Order no. 52 series of 2017 which served as a medium to acquire teachers' responses pertaining on their technology research management and their engagement. The research instrument is composed of 3 parts;

Part 1 was the teachers' demographic profile where they wrote their name as optional, sex, educational attainment, position and generation and number of years engaged in research. On the other hand, Part 2 were the five statements per sub-variables that described their management in technology research associated with a 4-point Likert scale which can be rated as "Highly Manageable, Moderately Manageable, Fairly Manageable, and Not Manageable". Moreover, there were ten statements that described the teachers' engagement in research which was rated as "Highly Engaged, Moderately Engaged, Fairly Engaged, and Not Engaged". Lastly, Part 3 of this instrument was the open-ended question where the teachers enumerated through interview the challenges that they encountered which served as hindrance for their technology research management and their engagement.

The research instrument was subjected to face validity by a panel of experts and faculty of the graduate school. The experts assessed whether the instrument can accurately gather the data to provide answers to the specific problems and determine the suitability and applicability of the statements in gathering the desired data for the study. Upon the panel of experts' approval, pilot testing was done to measure the level of consistency of an instrument through that manifests on its reliability by subjecting the instrument to the 30 non-respondents for them to answer. Afterwards, the instrument was retrieved for statistically treating the data through the use of Cronbach Alpha as generated by Statistical Package for Social Science (SPSS). Along the treatment, the instrument garnered a Cronbach alpha value of 0.982 classified from the range of 0.8-1.0 interpreted as "Excellent". This result implies that the statement within the instrument is concluded as consistent which manifests in its reliability. Since there was approval from the panel of experts pertaining to its validity, and proven on its reliability test, it was concluded that the instrument was recommendable to be used for the actual data gathering.

The study on "Technology Research Management, its influence on Teachers' Engagement", teachers in public elementary schools were the target respondents, utilized by a mixed-method research approach through a convenient sampling technique which determined the challenges encountered by the teachers in their research endeavor, the extent of their engagement in research, and the level of technology research management.

The survey was conducted by means of a letter addressed to the schools' division superintendent and school heads signed by the researcher and noted by the research adviser which explained the purpose of the study was presented for approval.

After obtaining the consent, the researcher immediately administered the survey to the respondents. This was done in a school to school basis when teacher-researchers were available for the said survey and interview. A brief orientation was made with the respondents explaining the significance of the study. Respondents were asked to respond the questions freely without time limitation and that they should not be hesitant to change their answers.

After administering the survey, questionnaires were collected immediately. Interview was done right after collecting the questionnaires, and sharing of experiences including the challenges they encountered while conducting their research study was well-taken in their respective notes. Some of the teachers who were not available during the said schedule of data gathering and interview were given a link for google form where they answered the survey questionnaire. Interview were conveniently done through video calls in Facebook messenger and Gmeet. This procedure was in compliance to the permit given by the schools' division superintendent following the "No Disruption of Classes Policy". The data gathered were treated with utmost confidentiality and were used for presentation, analysis, and interpretation in order to come up with the significant results and recommendations.

The study focused on several statistical analysis to properly discourse the existing problem. Gathered data were treated and analyzed with the use of a computer-based tool, the Statistical Package for Social Science (SPSS) which was more tactical and helpful.

Arithmetic Mean was utlized to measure the level of Technology Research Management, and their engagement on it.

Linear regression Analysis Test is for correlational analysis which was analyzed in this study to determine the significant influence of technology research management towards research engagement of teachers.

Independent Sample T-Test is utilized for comparative analysis focused on the teachers' sex- male or female, as a moderating variable to determine the significant difference of their technology research management and their engagement.

One Way Analysis of Variance (ANOVA) is used for comparative analysis focused on the teachers' educational attainment, generation, and position served as a moderating variable to determine the significant difference of their technology research management and their engagement.

Frequency and Percentage is used for qualitative problems to count the number of teachers having their mutual responses pertaining on the skills that they possessed, and their challenges that they encountered along with their technology research management and engagement, and to organize thematically.

## RESULT AND DISCUSSION

**Table 2: Level of Technology Research Management in terms of Technical Writing**

| **Statements**<br>As a teacher-researcher, I am able to manage on how to… | **Mean** | **Description** |
|---|---|---|
| 1. utilize Microsoft word to write research manuscript. | 3.57 | Highly Managed |
| 2. browse relevant literatures and studies from search engines. | 3.53 | Highly Managed |
| 3. determine the current trends pertaining on the research concern through various websites | 3.42 | Highly Managed |
| 4. paraphrase using AI. | 3.09 | Moderately Managed |
| 5. check grammar using AI. | 3.19 | Moderately Managed |
| **Overall Mean** | **3.36** | **Highly managed** |

**Legend**: 4.0-3.25-highly managed; 3.24-2.5-moderately managed; 2.49-1.75-fairly managed; 1.74-1.0 -not managed

Table 2 shows that the level of technology research management in terms of technical writing which obtained the highest mean of 3.57 described " highly managed" Among the given statements, the "As a teacher-researcher, I am able to manage on how to utilize Microsoft word as a tool to write research manuscript" gained the highest mean of 3.57 described "Highly Managed" which means that the teachers were able to utilize the Microsoft word as an Application Software for them to write their research manuscript since this Application Software is commonly used for teaching obligations such as developing their lesson plans, instructional materials, and others, which the same application that they used in writing their research manuscript. This implies teachers were able to go beyond in managing the utilization of Microsoft word for its purposes.

However, the statement "paraphrase using AI" got the lowest mean of 3.09 described "Moderately Managed" which means that teachers were somehow aware, practiced, and managed in paraphrasing statements relevant to their research. This implies some of the teachers cannot recognize the trend of using AI in grammar and composition which helps most especially in grammar. The importance of successfully expressing ideas in research manuscript writing cannot be emphasized by the scholars. AI paraphrasing tools act as flexible writing helpers, supporting researchers to be able to create content that is unique, smooth, and interesting. Given that the use of paraphrasing tools can be one of the aids in helping teacher-researchers learn paraphrasing, in this scenario, as cited by Miranda (2021).

In general, the level of Technology Research Management in Technical Writing of teachers, garnered an overall mean of 3.36 described "highly managed ". This means that elementary teachers of Zamboanga City were highly capable to manage their technological resources to support their technical writing on their research output.

**Table 3: Level of Technology Research Management in terms of Data & Statistical Analysis**

| **Statements**<br>As a teacher-researcher, I am able to manage on how to… | **Mean** | **Description** |
|---|---|---|
| 1. determine the appropriateness of statistical tool | 3.16 | Moderately Managed |
| 2. select appropriate statistical software like Microsoft Excel and SPSS | 3.15 | Moderately Managed |
| 3. utilize statistical tools to generate the result. | 3.22 | Moderately Managed |
| 4. extract sample size out of the entire population through G Power and Rao soft | 2.91 | Moderately Managed |
| 5. interpret the data based on the findings generated by the selected statistical software. | 3.03 | Moderately Managed |
| **Overall Mean** | **3.09** | **Moderately managed** |

**Legend**: 4.0-3.25-highly managed; 3.24-2.5-moderately managed; 2.49-1.75-fairly managed; 1.74-1.0 -not managed

Table 3 shows the result of the Level of Technology Research Management in Statistical & Data Analysis of elementary teachers. In the item "utilize statistical tools to generate the result", it garnered the highest mean of 3.22 described "moderately managed". This means that the elementary teachers were able to recognize and utilize the relevant application software to statistically treat their raw data as part on their research development as expected. On the other hand, item 4 "extract sample size out of the entire population through G Power and Rao soft" got the lowest mean of 2.91 described "moderately managed". This means that the elementary teachers were fairly capable to manage their technological resources by being able to extract the sample size out of the entire population through the current trends of statistical application software like G Power and Raosoft. This implies, teachers were able to manage this skill by means of asking assistance from colleagues who are experts in doing this. They needed assistance because they were not fully equipped and trained in utilizing these softwares. Maybe they are only good in using Slovin's formula but not the said advanced and latest software mentioned. And others are self-studying only thru YouTube tutorials on how to extract sample size using G Power and Raosoft. Thus, teacher-researchers need proper training in managing these up to date software as these are the latest statistics requirement to be able to extract sample size out of the entire population when conducting their research.

In general, the result to measure the level of technology research management in terms of statistical & data analysis among elementary teachers of Zamboanga City with the computed overall mean of 3.09 described "moderately

managed". This implies that teachers were able to somehow manage their capabilities and skills in analyzing statistical results and data of their conducted research and that managerial practices in relation to the statistical & data analysis relevant on the technology research management is good enough.

Furthermore, the elementary teachers were capable enough to manage their technological resources to determine the appropriateness of statistical tool, select the appropriate statistical software such as Microsoft Excel and SPSS and to utilize on it, able to extract the sample size out of the entire population through the current trends of statistical application software like G Power and Rao soft, and to interpret the data based on the findings generated by the selected statistical software. In this case, it implies also that the elementary teachers were oriented and trained on how to use and manage various technological support, resources and application software to statistically treat their data which affirmed by Qudus (2023) who advocates that the role of technology in research development improves the efficiency of research development.

**Table 4 Level of Technology Research Management in terms of Social Media Communication**

| Statements<br>As a teacher-researcher, I am able to manage social media to… | Mean | Description |
|---|---|---|
| 1. communicate with my key participants/respondents. | 3.53 | Highly Managed |
| 2. instill ethical principle using Facebook messenger. | 3.50 | Highly Managed |
| 3. disseminate research instrument using google link/forms. | 3.38 | Highly Managed |
| 4. collect the data using emails. | 3.27 | Highly Managed |
| 5. share significant findings in publishing websites. | 3.17 | Moderately Managed |
| **Overall Mean** | **3.37** | **Highly Managed** |

**Legend**: 4.0-3.25-highly managed; 3.24-2.5-moderately managed; 2.49-1.75-fairly managed; 1.74-1.0 -not managed

Table 4 shows the result to measure the Level of Technology Research Management in Social Media Communication whereas the item "communicate with my key participants/respondents" got the highest mean of 3.53 described "Highly Managed." This means that teachers are excellent in their managerial practices to employ the social media as a platform for communication in line with their research development. This further implies that teachers are very good in their communication skills specifically with the use of social media platforms like Facebook Messenger as this is the most convenient form of communication nowadays.

Also, the elementary teachers were able to share the significant findings in publishing websites with an individual mean of 3.17 described "Moderately Managed" which means that the elementary teachers have an experience to publish their research development as a way to share their significant findings in support on the social media as a platform. This implies that teachers are already aware of publishing their research work to disseminate their findings as well as their conclusions and recommendations not only in publishing websites but as well as in LAC sessions, INSET or even in a Research congress.

Overall, the teachers' level of technology research management in terms of social media communication with the garnered an overall mean of 3.37 described "Highly managed". This means that the elementary teachers were highly capable enough to utilize the social media as a platform to communicate with their key participants/respondents, instill ethical principle using Facebook messenger, disseminate research instrument using Google Link/forms, and collect the data using emails. This implies that, the elementary teachers were able to recognize and utilize the essence and salient features of social media application software to support in managing their research development which supported by the idea of Andoh, (2012) confirmed that the purpose of social medica communication to serve as a platform and bridge to connect with other people.

**Table 5: Level of Technology Research Management in terms of Plagiarism Tracking**

| Statements<br>As a teacher-researcher, I am able to manage in proofreading my manuscript by… | Mean | Description |
|---|---|---|
| 1. utilizing plagiarism checker software like Turnitin, etc. | 2.99 | Moderately Managed |

| | | |
|---|---|---|
| 2. tracking plagiarized statements. | 3.01 | Moderately Managed |
| 3. interpreting the results using plagiarism checker | 2.95 | Moderately Managed |
| 4. detecting grammatically-erroneous statements using Grammarly | 3.10 | Moderately Managed |
| 5. quoting statement using Quilbot. | 2.90 | Moderately Managed |
| **Overall Mean** | **2.99** | **Moderately Managed** |

**Legend**: 4.0-3.25-highly managed; 3.24-2.5-moderately managed; 2.49-1.75-fairly managed; 1.74-1.0 -not managed

Table 5 shows the result to determine the level of technology research management in terms of plagiarism tracking among elementary teachers of Zamboanga City. It acquired a highest mean of 3.10 in the item "detecting grammatically-erroneous statements using Grammarly" which described "Moderately Managed". This means that teachers are already mindful of using AI such as Grammarly in detecting grammar problems and errors committed in statements being made in their research studies. This implies that through AI, specifically Grammarly app, teachers are somehow aware enough that they can check if their grammar and statements are good enough and this can be considered as a great help in developing their research.

Meanwhile, in the item "quoting statement using Quilbot", garnered the lowest mean of 2.90 described as good. This means that teachers were somewhat aware of how to go about quoting statements using Quilbot app. This further implies that statements written by authors must be properly quoted by teachers with the help of AI so that no plagiarism issues will be encountered by the researcher.

Generally, the level of technology research management in terms of plagiarism tracking among elementary teachers of Zamboanga City with an overall mean of 2.99 described "Moderately Managed". This means, all managerial practices for the teachers in verifying the plagiarism content on their research development and all practices determined was moderately managed. This implies that the elementary teachers were capable to manage AI utilizing plagiarism checker software such as Turnitin and other relevant application software, track plagiarized statement, interpret the result given by the utilized plagiarism checker, detecting grammatically-erroneous statement using Grammarly, and to quote statement using Quilbot.

In line with this, the elementary teachers have an experience to manage their technology research through the relevant application software for plagiarism tracking in relation to their research development which confirmed by Elkhatat et al (2021) claiming that the capacity of relevant software is to assist the individuals for plagiarism checking.

**Table 6: Summary on the level of Technology Research Management**

| Technology Research Management | Mean | Description |
|---|---|---|
| Technical Writing | 3.36 | Highly Managed |
| Data & Statistical Analysis | 3.09 | Moderately Managed |
| Social Media Communication | 3.37 | Highly Managed |
| Plagiarism Tracking | 2.99 | Moderately Managed |
| **Grand Mean** | **3.20** | **Moderately Managed** |

**Legend**: 4.0-3.25-highly managed; 3.24-2.5-moderately managed; 2.49-1.75-fairly managed; 1.74-1.0 -not managed

Table 6 shows the result to measure the level of technology research management of elementary school teachers with social media communication as the highest mean of 3.37 described "Highly Managed". This means, that the elementary teachers were exceedingly capable enough to utilize the social media as a platform to communicate with their key participants/respondents, instill ethical principle using Facebook messenger, disseminate research instrument using Google Link/forms, and collect the data using emails. This implies that the elementary teachers were able to recognize and utilize the essence and salient features of social media application software to support in managing their research development. They no longer have doubts about managing social media communication because of their expertise. Meaning they are experts in utilizing and as well as managing the social media to come up with a research output.

Meanwhile, Plagiarism tracking management skills of teachers garnered the lowest mean of 2.99 described "Moderately Managed". This means that all managerial practices for the teachers in verifying the plagiarism content on their research development and all practices determined was upright. This implies that the elementary teachers were capable to manage AI utilizing plagiarism checker software such as Turnitin and other relevant application software to track plagiarized statement.

Overall, the computed grand mean of 3.20 described "Moderately Managed" which means that the elementary teachers were capable enough to employ and utilize various technology and to prepare their technological resources on their research involvement manifested on an excellent level of management towards technical writing and social media communication with the computed overall mean ranges from 3.36 to 3.37 and both of them described as "highly managed" since the necessary application software such as Microsoft offices and social media were always available and be up-to-trend on the 21st century generation. This implies that that common application software were daily used by teachers for their daily work and personal obligations and activities such as developing their lesson plans, instructional materials, assessment tools, and communication on their teaching and personal activities. Thus, the availability of those application software was the same application as they used on their technical writing and social media communication for their involvement in research. In line with this, the elementary teachers were very good and capable enough in technical writing and social media communication by means of the utilization of free application software that is always available online, and those application software can be used in almost all aspects such as in teaching and personal needs, and the way the teachers used those application software in doing their teaching and personal obligations were successfully applied on their research involvement such as developing their research manuscript, browsing necessary literature, editing format, and other means for technical writing and social media communication that the teachers were able to manage, brought by the availability of application software.

As supported by Coman et al (2020) proved that application software is intended to be used in all range of individual needs such as in work, business, working industry, researches, and other aspects.

In addition, other technology research management such as data & statistical analysis and plagiarism tracking utilized by teachers reaches a "moderately managed" level of management with the computed overall mean ranges from 2.99 to 3.09 manifested that the elementary teachers were fairly capable enough to manage their technological resources in support of data & statistical analysis and plagiarism tracking in support on their research involvement since the technology or application software that they commonly used such as Microsoft Excel to record and generate the academic grades of their students was the same software that they used for data & statistical analysis on their research involvement. However, the common application software that they commonly used has limited features since Microsoft excel cannot be employed for inferential statistics for them to fully treat their research statistics.

Moreover, the teachers have some orientation and managerial practices on how to track plagiarism content on their research development since the teachers were oriented and capable enough to track plagiarism content to their students specially on their performance tasks (PT) which was the same activity that they had done on checking their research development which affirmed by Vuckovic et al (2020) mentioned that the practices of teachers in data & statistical analysis and plagiarism tracking on their academic assessment of their students' performance were similar on checking their own research development. Thus, the teachers can treat their data & statistics and plagiarism tracking to check their own research development.

**Table 7: Teachers' Research Engagement in terms of Cognitive**

| | Statements | Mean | Description |
|---|---|---|---|
| As a teacher-researcher, I engage in DepED-Research activity by… | | | |
| 1 | participating in a training on how to conduct basic research | 3.30 | Highly Engaged |
| 2 | understanding the guidelines set by DepEd. | 3.36 | Highly Engaged |
| 3 | attending research-related sessions in Learning Action Cells | 3.37 | Highly Engaged |
| 4 | determining the trends to develop research | 3.27 | Highly Engaged |
| 5 | presenting the full-blown paper in a research congress | 3.01 | Engaged |
| | **OVERALL MEAN** | **3.26** | Highly Engaged |

**Legend**: 1.00-1.75=No Engagement; 1.76-2.50=Less Likely Engaged; 2.51-3.25=Engaged; 3.26-4.00=Highly Engaged

Table 7 shows the extent of research engagement in terms of cognitive among elementary teachers of Zamboanga City. Item number 3 "attending research -related sessions in Learning Action Cells" has the highest mean of 3.37 described "Highly engaged ". This means that teachers are highly engaged when it comes to LAC sessions about research topics. This implies that teachers were highly involved in their school activities particularly in LAC sessions pertaining to the conduct of research and other research-related topics.

On the other hand, the item "presenting the findings in a research congress" got a lowest mean of 3.01 described "engaged". This means that teachers are less likely involved in presenting their full- blown research output in a research congress since not all schools in Zamboanga City Division are conducting such activity. Because of this procedure that they have to face before claiming for a completion certificate from Planning and Research Division, teachers no longer proceed to this last step and thus no completion certificate were received. This implies that teachers are to get ready and be well equipped for this kind of event. They need to be prepared physically, mentally, emotionally for this research endeavor and later be greatly involved in a research congress to properly disseminate the significant findings, conclusions and recommendations of their conducted research.

In general, the extent of research engagement in terms of cognitive among elementary teachers of Zamboanga City with the computed overall mean of 3.26 described "Highly Engaged". Furthermore, this affirmed that the elementary teachers were able to prepare their cognitive aspect to support and engage on their schools' research project sought to be highly engaged to participate in a training on how to conduct basic research, able to understand the guidelines set by the Department of Education (DepEd), attending research-related sessions in Learning Action Cells (LAC) sessions, determining the trends to develop research and actively presented their findings in a research congress. In this result, it manifests that the elementary teachers of Zamboanga City were fully prepared their cognitive preparation which they highly engaged in schools' research project as claimed by Bircan et al (2016) mentioned that the cognitive aspect of an individual plays a significant role to be engaged on their agenda.

**Table 8: Teachers' Research Engagement in terms of Affective Aspect**

| Statements | | Mean | Description |
|---|---|---|---|
| As a teacher researcher, I engage in DepEd Research activity by… | | | |
| 1 | ensuring reliability of my research. | 3.38 | Highly Engaged |
| 2 | observing relevance on the trends/issues. | 3.33 | Highly Engaged |
| 3 | practicing rules and regulations in conducting research study | 3.32 | Highly Engaged |
| 4 | appreciating studies of other researchers | 3.43 | Highly Engaged |
| 5 | instilling my research-ethical principle | 3.40 | Highly Engaged |
| | **OVERALL MEAN** | **3.37** | **HIGHLY ENGAGED** |

**Legend**: 1.00-1.75=No Engagement; 1.76-2.50=Less Likely Engaged; 2.51-3.25=Engaged; 3.26-4.00=Highly Engaged

Table 8 shows the result to measure the extent of research engagement in terms of affective grounding among elementary teachers. Item "appreciating studies of other researchers" got the highest mean of 3.43 described "highly engaged ". This means that teachers are extremely involved when it comes to appreciation of research studies of other researchers. This implies that teachers gained their enthusiasm and interest in conducting their research because of the other researches' studies.

Meanwhile, the item "practicing rules and regulations in conducting research study" got the lowest mean of 3.32 described as "highly engaged." This means that teachers who are conducting research are very much conscious and are actually adhering to the rules and regulations set by DepEd in conducting their research study. This implies that teachers are substantially sensible enough to practice the rules and regulations when conducting their research study. In general, the teachers' research engagement in terms of affective aspect garnered the computed overall mean of 3.37 described "Highly Engaged". This means all affective preparations that allows the elementary teachers to be

engaged in schools' research project got the computed individual mean ranges from 3.32 to 3.40 and all of those preparations sought to be "Highly Engaged". This implies that the elementary teachers were able to instill their affective preparations beyond the extent to be involved on their research engagement by means of the assurance of the reliability of their research project, highly extent on the observance of the relevance based on the current trends and issues, consistently practiced the rules and regulations in conducting their research study, highly appreciated the studies of other researchers, and to instill the ethics in research.

In relation to this, it means that the elementary teachers were highly consistent, practiced, and prepared their affective preparation that allows them to be involved on the schools' research projects which confirmed by Wu et al (2019) stated that the individuals' affective domain serves as a significant impact to prepare and to pursue on their desired engagement that the individuals allow them to be involved.

**Table 9: Teachers' Research Engagement in terms of Behavioral Aspect**

| Statements | | Mean | Description |
|---|---|---|---|
| As a teacher-researcher, I manage my behavior in the conduct of research study by... | | | |
| 1 | handling personal emotions. | 3.54 | Highly Engaged |
| 2 | accepting criticisms constructively | 3.59 | Highly Engaged |
| 3 | instilling self-discipline | 3.57 | Highly Engaged |
| 4 | displaying humility in all circumstances | 3.56 | Highly Engaged |
| 5 | responding queries patiently | 3.58 | Highly Engaged |
| | OVERALL MEAN | 3.57 | **HIGHLY ENGAGED** |

**Legend**: 1.00-1.75=No Engagement; 1.76-2.50=Less Likely Engaged; 2.51-3.25=Engaged; 3.26-4.00=Highly Engaged

Table 9 shows the result to determine the extent of research engagement in terms of behavioral grounding among elementary teachers of Zamboanga City. The statement "accepting criticisms constructively" described "highly managed" means that teachers wholeheartedly accept constructive criticisms during the conduct of their research study. This further implies that teachers are sufficiently openminded to take advices and suggestions for the improvement and enhancement of their research study.

On the other hand, the statement "I manage my behavior in the conduct of research study by handling personal emotions got the lowest mean of 3.54 described "Highly Engaged". This means that teachers have composed personality who can set aside individual sentiments during the conduct of their study. This implies that as a professional teacher- researcher who can handle their personal issues can successfully conduct their research study without being affected with the challenges surrounding them. A teacher-researcher who is emotionally-driven and with positivity in life will be able to accomplish goals being set in due time.

In general, the extent of research engagement in terms of behavioral grounding among elementary teachers of Zamboanga City which attained the computed overall mean of 3.57 described "Highly Engaged". This means that, all bases manifested on the behavioral preparations which served as an asset for teachers to be involved on their research engagement signifies that the elementary teachers were able to possess the necessary behavioral traits that allows them to be involved on their schools' research projects. This implies teachers demonstrated through their highly capacitance in handling their personal emotions in dealing with various circumstances, highly accepted criticisms constructively, consistently displayed humility in all circumstances, and to instill self-discipline, and to genuinely responded various queries patently. In line with this, the elementary teachers were able to highly possess the abovementioned behavioral traits relevant on their engagement in schools' research project which confirmed by McClure (2023) claimed that the positive behavioral traits of an individual allow them to be involved on their desired area or field that they intend to venture on.

**Table 10: Summary of The Extent of Research Engagement**

| Research Engagement | Mean | Description |
|---|---|---|
| Cognitive | 3.26 | Highly Engaged |
| Affective | 3.37 | Highly Engaged |
| Behavioral | 3.57 | Highly Engaged |
| **GRAND MEAN** | **3.40** | **HIGHLY ENGAGED** |

**Legend**: 1.00-1.75=No Engagement; 1.76-2.50=Less Likely Engaged; 2.51-3.25=Engaged; 3.26-4.00=Highly Engaged

Table 10 shows the result to determine the extent of research engagement among elementary teachers of Zamboanga City with the computed grand mean of 3.40 described "Highly Engaged". In addition, all preparations that the elementary teachers need to prepare for them to be engaged in research such as their cognitive, affective, and behavioral preparations were "highly engaged" with the computed overall mean ranges from 3.26 to 3.57 defined "Highly Engaged". In this statistical result, it signifies that the elementary teachers goes beyond the extent on preparing their cognitive, affective, and behavioral preparations for them to be engaged in a schools' research development which becomes possible for the elementary teachers to finish their research projects as confirmed by Fredricks et al (2016) claimed that the cognitive, affective, and behavioral aspects of an individual were the fundamental asset for them to be engaged on a significant agenda.

**Table 11: Influence of Teachers' Research Management towards Engagement**

| Predictors | R | $R^2$ | Unst.Coff (Beta) | P-Value | Decision |
|---|---|---|---|---|---|
| Constant (C) | .686 | .470 | .435 | .100 | Not significant |
| C_TW | | | .230 | .019 | Not significant |
| C_DSA | | | .172 | .048 | Not significant |
| C_SMC | | | .319 | .001 | Significant |
| C_PT | | | .150 | .031 | Not significant |
| Constant (A) | .619 | .383 | .944 | .000 | Significant |
| A_TW | | | .222 | .023 | Significant |
| A_DSA | | | .132 | .128 | Not significant |
| A_SMC | | | .319 | .001 | Significant |
| A_PT | | | .068 | .319 | Not significant |
| Constant (B) | .541 | .293 | 1.706 | .000 | Significant |
| B_TW | | | .330 | .000 | Significant |
| B_DSA | | | .051 | .508 | Not significant |
| B_SMC | | | .255 | .004 | Significant |
| B_PT | | | -.088 | .154 | Not significant |

**Legend**: C_TW = Cognitive Technical Writing
C_DSA = Cognitive Data and Statistical Analysis
C_SMC = Cognitive Social Media Communication
C_PT = Cognitive Plagiarism Tracking
A_TW = Affective Technical Writing
A_DSA = Affective Data and Statistical Analysis
A_SMC = Affective Social Media Communication
A_PT =Affective Plagiarism Tracking
B_TW = Behavior Technical Writing
B_DSA = Behavior Data and Statistical Analysis
B_SMC = Behavior Social Media Communication
B_PT = Behavior Plagiarism Tracking

Table 11 shows the multiple regression analysis of the teachers' technology research management such as technical writing, data and statistical analysis, social media communication, and plagiarism tracking and its significant influence on their research engagement which includes their cognitive, affective and behavior as a predictor.
Cognitive

The teachers' cognitive as part of their research engagement based on their social media communication in technological research management (C_SMC) as a predictor got the highest unstandardized coefficient (Beta) score of .319 with the probability value of .001 and it is lesser than the alpha level of 0.05 which indicates that the hypothesis of "No significant influence of the teachers' technology research management in terms of social media communication on their research engagement in terms of cognitive" is rejected. Further, this finding shows that there is a chance for the teachers on their cognitive in research engagement to be enhanced due to the social media communication that they were able to managed as part of their technology research management. In addition, there was a r-value of .686 indicates that there is a strong association between the teachers' cognitive and their management in social media communication. Also, there was a 47% chance to enhance the cognitive of teachers brought by the social media communication that they were able to manage.

This implies that the more teachers able to manage their social media communication on their technology research management considering its communication with the key participants, instill ethical principles on utilizing social media platforms, disseminating research instrument via online, collecting data through email and share significant findings in publishing websites, the more teachers able to engage their cognitive capacity along with their research engagement that manifests on their participation in training, understanding its guidelines, attending research-related sessions, determining its trends, and presenting the findings in a research congress. This becomes possible due to the salient features embeds in a social media platform that promotes the teachers' capacity on their cognitive aspect for them to be engage in research. This was supported by Lara, R (2021) who claimed that the social media can benefit individuals' cognitive ability for them to be engaged in a necessary activity.

TREC=.435+.319 (SMC)

Since the linear model for teachers' cognitive based on their research engagement is the sum of the product of teachers' technology research management specifically on the social media communication. It shows that social media communication has a direct proportional relationship towards the teachers' cognitive. It confirms that the more teachers able to manage their social media communication as part of their technology research management, the more they engage their cognitive aspects along with their research engagement. Thus, the teachers' cognitive in research engagement significantly influence by their social media communication in technology research management.
Affective

The teachers' affective as it includes on their research engagement through the social media communication in technological research management (A_SMC) as a predictor got the highest unstandardized coefficient (Beta) score of .319 with the probability value of .001 and it is lesser than the alpha level of 0.05 which indicates that the hypothesis of "No significant influence of the teachers' technology research management in terms of social media communication on their research engagement in terms of affective" is rejected. Moreover, it shows that there is a possibility to enhance the affective aspect of the teachers along with their research engagement because of the social media communication that they were able to manage on their technology research management. Furthermore, there was a r-value of .686 interpreted a strong association between the teachers' affective and their management in social media communication. Lastly, there was a 47% chance to enhance the affective of teachers brought by the social media communication that they were able to manage.

Based on the statistical report given, it implies that the more teachers able to manage their social media communication as part of their technology research management which includes in managing on communicating with the key participants, instill ethical principles on utilizing social media platforms, disseminating research instrument via online, collecting data through email and share significant findings in publishing websites, the more teachers able to assure the reliability of research, observe relevance on the trends/issues, practice the rules and regulation in conducting a research study, appreciation on the other research studies, and instill research-ethical principles. This becomes possible since social media communication instills the netiquette on utilizing this platform

for academic purposes. Thus, social media communication that was able to manage by the teachers obeys the netiquette principles to promote the affective aspect of teachers along with their research engagement. This is supported by the Molinaro D (2022) justified that all social media platforms embed the netiquette principles, policies, and guidelines on how individuals be responsible in utilizing social media platform towards all purposes including academic purpose.

Furthermore, the teachers' management in technical writing towards their research engagement particularly in affective aspect (A_TW) gained the least unstandardized coefficient (Beta) score of .222 with the probability value of .023 and it is lesser than the alpha level of 0.05 which indicates that the hypothesis of "No significant influence of the teachers' technology research management in terms of technical writing on their research engagement in terms of affective" is rejected. In line with this, it implicates that there is a chance to enhance the affective aspect of the teachers along with their research engagement due to managing technical writing along with their technological research management. Moreover, there was a r-value of .686 interpreted a strong association between the teachers' affective and their management in technical writing. Lastly, there was a 47% chance to enhance the affective of teachers brought by the technical writing that they were able to manage.

This means that the more teachers able to manage their technical writing aspect as part of their technology research management, the more affective aspect they were able to enhance. Thus, this becomes possible for the teachers' assurance on the reliability of their research, observance on the relevance on the trends/issues, practice rules and regulations, appreciation of the studies, and instill research-ethical principles to be more considered along with their research engagement when they were able to manage on utilizing Microsoft word to write a research manuscript, browse relevant literatures and studies from searching engines, determining the current trends from a various websites, paraphrase and checking grammar using Artificial Intelligence (AI) software. It becomes possible if the teachers are consistently practice in utilizing technological platforms and software for them to write a research study since it embeds the ethical standards in writing a research study and utilizing a technological platform that influences their affective aspect along with their research engagement. This is supported by Kissel burgh, L et al (2022) said that one of the key areas that individuals need to practice is the ethics along with their research engagement and utilization of technology for any academic purposes. Thus, there is a prescribed policy that individuals need to obey for them to avoid a conflict of interest on the conduct of research and utilization of technology in support on the Anti-cybercrime law.

TREA=.944 + .319 (SMC) + .222 (TW)

Since the linear model for teachers' affective based on their research engagement is the sum of the product of teachers' technology research management particularly on the social media communication and technical writing. It proves there that both social media communication and technical writing has a direct proportional relationship towards the teachers' affective. It affirms that the more teachers able to manage their social media communication and technical writing, the more they engage their affective aspects along with their research engagement. Thus, the teachers' affective in research engagement significantly influence by their social media communication and technical writing in technology research management.

**Behavior**

The teachers' behavior as part of their engagement in research through technical writing in technology research management (B_TW) garnered the highest unstandardized coefficient (Beta) score of .330 with the probability value of .000 and it is lesser than the alpha level of 0.05 which indicates that the hypothesis of "No significant influence of the teachers' technology research management in terms of technical writing on their research engagement in terms of behavior" is rejected. In addition, it shows that there is a possibility to improve the behavioral practices of the teachers along with their research engagement due to managing technical writing as part on their technology research management. Furthermore, there was a r-value of .541 interpreted a strong association between the teachers' behavior and their management in technical writing. Lastly, there was a 29.3% chance to enhance the behavioral practices of teachers brought by the technical writing that they were able to manage.

This means that the more teachers able to manage in technical writing, the more they practice the prescribed behavioral practices along with their research engagement. This implies that when a teachers able to manage in

utilizing Microsoft word to write their research manuscript, browse relevant literatures and studies from the searching engines, determining the current trends, paraphrase and checking grammar of research manuscript using Artificial Intelligence (AI) software, the more teachers able to cope with their behavioral practices such as handling personal emotions, accepting criticisms, instilling self-discipline, displaying humility in all circumstances, and responding queries patiently. Thus, the more they manage technical writing, the more those behavioral practices obeyed. This becomes possible since teachers were oriented on the different prescribed behavioral practices that they need to obey along with their engagement in research including in writing a research manuscript in support on the Intellectual Property (IP) code under the Republic Act. No 1091 whereas, teachers are able to comply the different behavioral and ethical practices that needs to associate along with writing a research manuscript.

Furthermore, the teachers' management in social media communication towards their behavior in research engagement (B_SMC) obtained the unstandardized coefficient (Beta) score of .255 with the probability value of .004 and it is lesser than the alpha level of 0.05 which indicates that the hypothesis of "No significant influence of the teachers' technology research management in terms of social media communication on their research engagement in terms of behavior" is rejected. Moreover, it reveals that there is a chance to improve the behavioral practices on their engagement in research because of social media communication that they were able to manage along with their technology research management. In addition, there was a r-value of .541 interpreted a strong association between the teachers' behavior and their management in social media communication. Lastly, there was a 29.3% chance to enhance the behavioral practices of teachers brought by the social media communication that they were able to manage.

It implies that the more teachers able to manage their social media communication as part of their technological research management, the more they can cope their behavioral practices associated on their engagement in research. This means that it is possible for the teachers to be more practice in handling personal emotions and criticisms, instilling self-discipline, displaying humility, and responding queries when teachers able to manage on utilizing social media platforms with its salient features in communicating with the key participants, instilling ethical principles, disseminating research instrument via online, collecting the data using emails, and sharing significant findings in publishing websites. This becomes possible since the social media platforms embeds with the netiquette guidelines as part on the Republic Act no. 8293 otherwise known as the Intellectual Property (IP) code where the different ethical and prescribed behavioral practices need to be obeyed along with the engagement in research and utilization of social media platform.

TREB=.1.706 + .330 (TW) + .255 (SMC)

Since the linear model for teachers' behavior based on their research engagement is the sum of the product of teachers' technology research management particularly on technical writing and social media communication. It proves there that both technical writing and social media communication has a direct proportional relationship towards the teachers' behavior. It confirms that the more teachers able to manage in technical writing and social media communication, the more prescribed behavior in research engagement be practiced. Thus, the teachers' behavior in research engagement significantly influences by both technical writing and social media communication in technology research management.

**Table 12: Elementary Teachers' Technology Research Management in terms of Sex**

| Variable | Sex | n | Mean | t-Value | p-Value | Interpretation |
|---|---|---|---|---|---|---|
| Technology Research Management | Male | 21 | 3.25 | .449 | .654 | Not Significant |
| | Female | 141 | 3.20 | | | |

Table 12 shows the result of test for the significant difference in technology research management among elementary teachers compared according to their sex given the generated probability value of .654 which goes beyond from the recommended alpha level of 0.05 which leads into conclusion that the null hypothesis stated " There is no significant difference of technology research management towards research engagement of elementary school teachers when data clustered according to their sex." was accepted, together with the computed means per sex ranges from 3.20 to 3.25 having the same description of "not significant" which implies that there was no

significant difference of the technology research management among elementary teachers between male and female. This means that the good practices and capacity of teachers to manage their technical writing, statistical & data analysis, social media communication, and plagiarism tracking does not vary according to their sex.

This leads that the teachers, despite of their sex has equal orientation, understanding, managerial practices, and preparation to manage their technological management. It becomes possible due to having their equal opportunity offered by the school administration to cater all teachers on their research involvement, equal access for training through In-Service Training (INSET) conducted by the school administration on an annual basis which motivates and allows all teachers to gain the necessary capacity to manage their technological management in terms of technical writing, data & statistical analysis, social media communication, and plagiarism tracking in support on their research involvement.

This proves also that the school administration of the selected elementary schools in Zamboanga City promotes justice by means of providing equal access, opportunity, provision of teachers' necessities to upgrade their competence in managerial practices in technological research management. This statistical report supports to the idea of Shields et al (2023) claimed that the equal access, opportunity, and provision of needs to the individuals across their gender differences promotes social justice that allows them to work hand-in-hand to reach their common goals.

**Table 13**: **Elementary Teachers' Technology Research Management in terms of Educational Attainment**

| Variable | Educational Attainment | n | Mean | f-Value | p-Value | Interpretation |
|---|---|---|---|---|---|---|
| Technology Research Management | Baccalaureate Degree | 5 | 2.68 | 1.29 | .141 | Not Significant |
| | Masters' Units Earner | 103 | 3.21 | | | |
| | Masters' Full Pledge | 34 | 3.18 | | | |
| | Doctors' Units Earner | 15 | 3.23 | | | |
| | Doctors' Full Pledge | 5 | 3.80 | | | |

Table 13 revealed the result of test for the significant difference of the technological research management among elementary teachers of Zamboanga City which compared according to their educational attainment with the probability value of .141 which exceeds the recommended alpha level of 0.05 which leads into the conclusion that the hypothesis "There is no significant difference of technology research management towards research engagement of the respondents when data clustered according to their educational attainment". Is accepted which implies that all elementary teachers, despite of their differences in their educational attainment has similar managerial practices and capacity through the technology that allows them to be involved in schools' research project.

Furthermore, these findings revealed, proved that the school administration of each elementary school in Zamboanga City was able to provide equal access, opportunities, and assistance to all the teachers regardless of their differences in educational attainment. These findings revealed, proved that the school administration committed to their service, particularly through the vision statement of Department of Education (DepED) ensured that they were committed to upgrade the capacity of the teachers which supported by the idea of Maligalig (2011) claimed that despite of the teachers' differences in educational attainment, it is the obligation of the school administration to provide equal access, opportunity, and necessities to all the teachers as a way to gain mutual understanding and competence in line with the agenda that the school aimed to reach.

**Table 14: Elementary Teachers' Technology Research Management in terms of Position**

| Variable | Position | n | Mean | f-Value | p-Value | Interpretation |
|---|---|---|---|---|---|---|
| Technology Research Management | Teacher I | 39 | 3.35 | 1.08 | .360 | Not Significant |
| | Teacher II | 9 | 3.06 | | | |
| | Teacher III | 84 | 3.19 | | | |
| | Master Teacher I | 20 | 3.11 | | | |
| | Master Teacher II | 5 | 2.87 | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Master Teacher III | 5 | 3.33 | | | |

Table 14 shows the result to determine the significant difference of the technology research management of elementary teachers in Zamboanga City which was compared according to their position with the probability value generated of .360 which goes beyond the recommended alpha level of 0.05 which leads into conclusion that the hypothesis "There is no significant difference of technology research management towards research engagement of elementary school teachers when data clustered according to their position". is accepted which implies that the good practices and preparations of elementary teachers through their technical writing, data & statistical analysis, social media communication, and plagiarism tracking do not vary in terms of their differences in position. This means that all teachers despite of their position has the same orientation, training grounded, and capacity in managing their technological resources in relation on their schools' research project. Furthermore, these findings prove that the elementary school administration of Zamboanga City provided equal access and opportunities to all the teachers that allowed them to practice technology research management which supported by the vision of the Department of Education (DepED) which committed the school administration to do their best to continually improve for the betterment of DepEd.

**Table 15: Elementary Teachers' Technology Research Management in terms of Generation**

| Variable | Generation | n | Mean | f-Value | p-Value | Interpretation |
|---|---|---|---|---|---|---|
| Technology Research Management | Baby Boomer | 11 | 3.15 | 1.15 | .274 | Not Significant |
| | Generation X | 65 | 3.05 | | | |
| | Millennials | 86 | 3.33 | | | |

Table 15 revealed the result of test for the significant difference of the technology research management among elementary teachers of Zamboanga City which was compared according to their generation with the probability value of .274 which greater than the alpha level of 0.05 which further concludes that the hypothesis "There is no significant difference of technology research management towards research engagement of elementary school teachers when data clustered according to their generation". is accepted which implies that all teachers, despite of their generation that manifested of their living age does not vary in terms of their managerial practices through their technical writing, data & statistical analysis, social media communication, and plagiarism tracking manifested on their managerial practices through technology in research.

This finding assured that the elementary teachers have mutual understanding, opportunity and capacity on the utilization of the different technological resources and application software on their technical writing, data & statistical analysis, social media communication, and plagiarism tracking those manifests on their technological research management. Having an equal opportunity and equal understanding to all the teachers, despite on their generation sought to have a positive indication on their research involvement as it supports on the vision of Department of Education (DepED) which they committed to upgrade the capacity of teachers in the attainment of their common goals.

**Table 16: Elementary Teachers' Technology Research Management in terms of number of years engaged in Research**

| Variable | Years Engaged | n | Mean | f-Value | p-Value | Interpretation |
|---|---|---|---|---|---|---|
| Technology Research Management | 1 year below | 75 | 3.17 | 1.12 | .311 | Not Significant |
| | 1-2 years | 38 | 3.18 | | | |
| | 3-4 years | 10 | 3.19 | | | |
| | 4-5 years | 39 | 3.29 | | | |

Table 16 shows the result of test for the significant difference of the technological research management of elementary teachers in Zamboanga City which compared according to their number of years of engagement in schools' research project given with the probability value of .311 which goes beyond the recommended alpha level of 0.05 leads into conclusion that the hypothesis "There is no significant difference of technology research management towards research engagement of elementary school teachers when data clustered according to their

number of years engaged". is accepted which further implies that the elementary teachers who were appointed as researchers for the schools' research project does not vary in terms on their years of engagement in research. Meaning, all teacher-researchers despite on their years of engagement does not vary in terms on their technical writing, data & statistical analysis, social media communication, and plagiarism tracking as a fundamental managerial practices in the utilization of technology on their research engagement since the elementary teachers through the DepED order number 16, s. 2017 mandates all teacher-researchers to meet the required level of capacity in the utilization of technological support and resources on their research engagement.

**Table 17: Elementary Teachers' Research Engagement in terms of Sex**

| Variable | Sex | n | Mean | t-Value | p-Value | Interpretation |
|---|---|---|---|---|---|---|
| Research Engagement | Male | 21 | 3.35 | -.518 | .605 | Not Significant |
| | Female | 141 | 3.41 | | | |

Table 17 shows the result to determine the significant difference of research engagement of elementary teachers of Zamboanga City as the data clustered according to their sex garnered a computed probability value of .605 which was greater than the alpha level of 0.05 together with the mean scores between male and female ranges from 3.35 to 3.41 described "Highly Engaged" which leads into conclusion that the hypothesis "There is no significant difference of teachers' research engagement when data clustered according to their sex". is accepted which implies that the elementary teachers who were the researchers for the schools' research project were able to prepared their cognitive, affective, and behavioral characteristics that manifested on their research engagement among male and female teachers.

Thus, both male and female teachers were given the chance or opportunity to be highly engaged in schools' research project. This statistical result proves that the elementary school administrators of Zamboanga City became fair in providing equal access, opportunities, and assistance to both male and female teachers for their research engagement. Providing equal access promotes equal opportunities for the teachers as claimed by Cardona (2023) claimed that being fair in providing equal access and opportunities promotes more productive of the schools for the completion of the necessary work tasks.

**Table 18: Elementary Teachers' Research Engagement in terms of Educational Attainment**

| Variable | Educational Attainment | n | Mean | f-Value | p-Value | Interpretation |
|---|---|---|---|---|---|---|
| Research Engagement | Baccalaureate Degree | 5 | 2.82 | .834 | .701 | Not Significant |
| | Masters' Units Earner | 103 | 3.38 | | | |
| | Masters' Full Fledge | 34 | 3.52 | | | |
| | Doctors' Units Earner | 15 | 3.29 | | | |
| | Doctors' Full Fledge | 5 | | | | |

Table 18 shows the result to track the significant difference of the research engagement of elementary teachers of Zamboanga City as the data compared based on the statement "There is no significant difference of teachers' research engagement when data clustered according to their educational attainment". with the computed probability value of .701 which goes beyond the alpha level of 0.05 signifies that despite of the teachers' differences in terms of their educational attainment, all of them were able to prepare their cognitive, affective, and behavioral characteristics demonstrates their engagement in schools' research projects since the DepED order number De Guzman ( 2003 ) mentioned that the department through the authority and power of the school heads encouraged all teachers to join, participate, and engaged in a schools' research project as a way for the schools to determine the trends and issues of the school which serves as a grounding point for interventions resulted on the continuous improvement in support on the vision of the Department of Education (DepED). Moreover, there was no restriction of the department pertaining on the engagement of teachers based on their educational attainment for joining and participating for the schools' research project.

**Table 19: Elementary Teachers' Research Engagement in terms of Position**

| Variable | Position | n | Mean | f-Value | p-Value | Interpretation |
|---|---|---|---|---|---|---|
| Research Engagement | Teacher I | 39 | 3.47 | 1.18 | .264 | Not Significant |
| | Teacher II | 9 | 3.54 | | | |
| | Teacher III | 84 | 3.38 | | | |
| | Master Teacher I | 20 | 3.34 | | | |
| | Master Teacher II | 5 | 3.05 | | | |
| | Master Teacher III | 5 | 3.49 | | | |

Table 19 shows the result to determine the significant difference of the research engagement among elementary teachers which garnered a computed probability value of .264 which was greater than the alpha level of 0.05 leads into conclusion that the hypothesis "There is no significant difference of teachers' research engagement when data clustered according to their position". is accepted which further implies that the elementary teachers, despite of their differences based on their position does not vary in terms of their engagement in schools' research project.

Furthermore, all teachers across any position were given the chance to be prepared in terms of their cognitive, affective, and behavioral characteristics for their involvement in schools' research project offered by the school administration through their trainings and technical assistance that they provided to the teachers aspiring to be the researcher for their schools. This finding proves that all teachers, despite of their differences in terms of their position were given an equal opportunity to be engaged in schools' research projects through the DepED order number 16, s 2017 encouraged all teachers to be engaged in a schools' research project as a way for the continuous improvement of the schools' services.

**Table 20: Elementary Teachers' Research Engagement in terms of Generation**

| Variable | Generation | N | Mean | f-Value | p-Value | Interpretation |
|---|---|---|---|---|---|---|
| Research Engagement | Baby Boomer | 11 | 3.28 | 1.17 | .269 | Not Significant |
| | Generation X | 65 | 3.32 | | | |
| | Millennials | 86 | 3.48 | | | |

Table 20 shows the result to test the significant difference of the research engagement among elementary teachers of Zamboanga City based on their generation with the computed probability value of .269 which was greater than the alpha level of 0.05 and having a mutual responses from the teachers with the computed mean ranges from 3.28 to 3.48 described "Highly Engaged" leads into conclusions that the hypothesis " there is no significant difference of teachers' research engagement when data clustered according to their generation". was accepted, and this result further implies that all elementary teachers, despite of their generation were able to be highly engaged in a schools' research project. Meaning, all teachers were able to prepare their cognitive, behavioral, and affective characteristics which serves as their asset to be engaged in a schools' research projects. This statistical result supports on the memorandum granted by the DepEd no. 16, s. 2017 stated that all teachers has given an equal opportunity to be engaged in a schools' research project.

**Table 21: Elementary Teachers' Research Engagement in terms of Number of Years Engaged in Research**

| Variable | Years Engaged | n | Mean | f-Value | p-Value | Interpretation |
|---|---|---|---|---|---|---|
| Research Engagement | 1 year below | 75 | 3.35 | 1.39 | .114 | Not Significant |
| | 1-2 years | 38 | 3.28 | | | |
| | 3-4 years | 10 | 3.46 | | | |
| | 4-5 years | 39 | 3.61 | | | |

Table 21 shows the result to track the significant difference of the research engagement among elementary teachers of Zamboanga City based on their years of engagement as a researcher for their schools' research project with the computed probability value of .114 which was greater than the alpha level of 0.05 together with the computed mean score per years engaged ranges from 3.28 to 3.61 having the same description of "Highly Engaged" which further

implies that the hypothesis "There is no significant difference of teachers' research engagement when data clustered according to the number of years engaged". was accepted. This statistical finding implies that all elementary teachers, despite of their years of engagement on their schools' research project do not vary in terms of their engagement in research. This means that the preparation among teachers, despite of their differences based on their years of engagement able to prepare their cognitive, behavioral, and affective characteristics that allows them to be highly engaged in a schools' research project. This finding supports the memorandum of the DepED order number 39, s 2016 proven that the elementary school administrator of Zamboanga City able to meet the mandates of encouraging teachers to be involve as a researcher for their schools' research project as a way to promote the research culture of their schools.

**Thematic Analysis**

This section presents the analysis of the varied themes that were put forward by the challenges encountered by elementary school teachers in technology research management relevant to their research engagement. These common themes were drawn out from the respondents' individual experiences presented in the transcript from the interview conducted.

**Common Themes**

The common themes were drawn from the individual themes that the elementary school teachers narrated. The various experiences of the elementary school teachers generated similar ideas, parallel experiences, and at times similar responses to different situations. These common themes are presented under a general concept according to elementary school teachers experiences. A summarized analysis of each common theme is also presented.

**Table 22: Challenges Met by Teachers in Technology Research Management**

| Common Themes | Number of Participants/Total Number | Percentage |
|---|---|---|
| 1. Lack of Time Flexibility | 12/20 | 60.00 |
| 2. Limited Resources | 6/20 | 30.00 |
| 3. Lack of Technical Competence | 5/20 | 25.00 |
| 4. Limited Opportunity | 5/20 | 25.00 |

Table 22 shows the result in determining the challenges met by the elementary teachers of Zamboanga City on their technology research management based on the twenty (20) teachers interviewed.

**1. Lack of Time Flexibility**

Out of twenty participants, twelve 12 (60%) said that teachers have difficulty to spend their time in engaging in a schools' research project due to massive overloaded teaching responsibilities, heavy school paper works with a very limited deadline. Participant 7 said *"Time and school works are the challenges I encountered. Thus, it prolongs my research study". This was also confirmed by Participant 5 by saying that "Lack of time because of the activities in school". Participant 17 affirms that "Time is a challenge for me to finish my research, it's not easy to conduct research while working".*

Those factors affect the teachers to spend their time to be engaged in their school research projects, despite of their willingness to venture on with their research study. Also, some teachers were able to complete their school research project, however, the expected time for them to finish their research study exceeds already to the given deadline due to the massive, overloaded responsibilities that hinders teachers to finish their research study. In fact, Ertürk (2022) claimed also that limited time given to the individuals may affect the quality of their work.

It further suggested by Ulla et al. (2017) that the schools and other educational institutions should also recognize that conducting research adds to the workload of teachers. As a result, teachers should be allowed enough time to undertake both teaching and research. By providing the necessary assistance, instructors will not only appreciate it,

but will also see the value and benefits of conducting research for their professional development, both for themselves and their pupils.

**2. Limited Resources**

Furthermore, six 6(30%) elementary teachers found that limited resources pointed out as a challenging on their part on their engagement in schools' research project such as insufficient quantity of electronic devices and application software (apps) installed on their computer device which hinders them to finish their research study. Participant 3 stated that *"Staying up to date with learning technology is a challenge in the conduct for research. I received my paper with corrections and I do not know how to go about the plagiarism issue. After a week of reading and rephrasing some parts, I came across Grammarly and another paraphrasing tool Quilbot. Statistical issues are no longer a problem to researchers for we can always ask someone to do it for us"*. This was supported by participant 13 who affirmed that *"Inaccessibility of research sources and journal databases are my challenges in doing research"*. In addition, those teachers who cannot efficiently finish their research study brought by the limited financial resources to spend the necessary materials, and other necessities to support the completion of their schools' research projects. In line with this, they claimed that limited material and financial resources affects the efficiency of the completion of their schools' research projects as concluded by Okongo et al (2015) that limited necessary resources negatively affects the quality of products produced.

However, El Semary (2011) find out the barriers on the use of technology in education of UAE University through case study analysis. Along with the study that was examined, findings revealed that there was a hindrance on the compliance of requirements for faculty to integrate technology into the development of their instructional processes; technicians experienced difficulty to use educational technology effectively; lack of equipment and its maintenance. Based on the data presented, this study suggests that the three parties (faculty-students-technicians) have to collaborate to design a plan of action and strategy for applying effective teaching strategies to develop the classroom teaching process without adding to the University budget.

**3. Lack of Technical Competence**

In addition, five 5(25%) elementary teachers sought that lack of technical competence serves as a significant factor that affects the efficiency to finish their schools' research projects. They claimed that they have a difficulty such as limited skills on the utilization of statistical software, utilization of necessary electronic device, and less likely skillful in developing a research instrument through Google Form. Participant 12 said that *"Inaccessibility of research sources and journal databases are the challenges met while I was conducting research"*. Meanwhile, Participant 13 revealed that *"respondents have limited knowledge on answering survey using goggle forms. It is time consuming as the researcher needs to gather data manually. And researcher's limited knowledge on how to present research study in a research congress"*. This was supported by Participant 15 accordingly, *"The challenges I encountered in engaging research was the changed of the format/parts of action/basic research. This resulted to longer time to finish the action/basic research"*. In line with this, limited technical competence serves as the hindrance to finish their research study efficiently as proved by Andrade (2019) that limited technical competence affects the quality of their output.

According to the findings of Collado et al (2021) the shift is viewed as both a chance for professional growth and a period of enormous difficulty in carrying out teaching responsibilities. The latter, however, dominates the storylines. Some of the issues that occurred included logistical limits caused by limited resources, increased effort, and anxiety over the quality of online education. We argue that the perceived suddenness of such a need for change, as expressed in these tales, reveals how alien online learning is to teachers in general. We further contend that the difficulties in this shift are the result of decades of underinvestment in distant learning, as indicated by the country's insufficient information and communication infrastructure. This inability to invest in digital modality may indicate a lack of vision regarding the usefulness of technology in expediting educational procedures and increasing outcomes in a variety of contexts and conditions.

**4. Lack of opportunity**

In addition, five 5(25%) elementary teachers sought that limited opportunity serves as significant issues that affects their involvement in schools' research project since there were some instances that their research studies have difficulties to approve by their heads. Some of those have limited chance to communicate on their key participants,

and limited grants from their heads that less likely allowed the teachers to join and participate on the schools' research projects. Participant 8 disclosed that *"to be able to get a 100% participation of respondents and retrieving of questionnaire or survey is a challenge, it somehow made me wary that I will not be able to retrieve enough data for my research and that I will not be able to finish on time"*. This was reinforced by Participant 11 who said that *"Respondents took time in returning the checklist/ questionnaire or lost them, if send via google form would say no load or poor connection. Also, Statistics is also a challenge, I need to look for statistician to help me interpret the results and I need to spend for a fee"*. Meanwhile, Participant 11 said that *"Challenges and situations can also occur in which research and teaching are less compatible, and can create ethical dilemmas. The problems usually relate to issues: privacy, informed consent, or freedom to participate"*. In line with this, Tindowen et al (2019) supported that the limitation of opportunities granted to the individuals might prohibit them on their research involvement.

Moreover, Almonicar (2022) said that teachers and schools can also partner with other institutions and invite experts to speak about research as part of their SLAC program. Furthermore, the school administrator can access reference materials such as journals, research books, and other resources needed for research in order to support teachers who want to undertake research in their classrooms.

Finally, respondents made an important suggestion: collaborate with other organizations that can help participants expand their knowledge and skills in conducting research. This is exactly what other schools are doing to persuade professors to pursue careers in research. Frequently, the collaborating groups discover that they share shared interests in research difficulties and work together on a specific research project. This also helps to build healthy alliances with other institutions that share the same vision and goals.

The elementary teachers interviewed sought that they have challenges met in technological research management. Thus, time flexibility, limited resources, lack of technical competence, and limited opportunity were the common challenges sought by the elementary teachers which significantly affect on the quality of the completion of their schools' research project.

**Acknowledgements**

1. To God the Father Almighty for giving the researcher the strength and chance to complete her Doctor of Philosophy degree with major in Technology Management (PhD- TM).
2. The researcher would also like to express gratitude and appreciation to the key figures who have contributed considerably to the accomplishment of this academic achievement.
3. Dr. Nelson P. Cabral, President, Zamboanga Peninsula Polytechnic State University because the researcher was given the chance to carry out the study.
4. Dr. Elizabeth Jane P. Sebastian, Dean of Zamboanga Peninsula Polytechnic State University- Graduate School (ZPPSU-GS), for her approval and guidance in terms of the admission process, orientation for the conduct of dissertation study, and technical assistance on the admission process.
5. Dr. Jocelyn I. Kong, adviser, for all the assistance she provided in contributing her knowledge, suggestions, counsel, help, and support that inspires, nourishes, and directs researcher in order to significantly advance and improve her research journey.
6. Dr. Fe E. Lim, chairman of the Panel, for her critique evaluation, validity testing of the research instrument, comments, suggestions, assistance, and encouragement given to the researcher for the improvement and motivation on the conduct of the research study.
7. Dr. Benhur A. Asid, a member of the panel, for his remarkable suggestions, comments, and critical evaluation that guide the researcher in the conduct of the research study.
8. Dr. Judith Maghanoy, panelist and critic reader, for her insightful feedback, grammatical and content checks, plagiarism tracking, validity testing of the research instrument, ideas, and remarks that helped the researcher to have a better research study.
9. Dr. Annabelle F. Mortera, member of the panel, for her exceptional evaluation, remarks, feedback, and suggestions pertaining to the statistical analysis and evaluation of findings of this study, validity testing of the research instrument, and providing areas of improvement that guide the researcher for the development of research study.
10. Graduate School Professors for being great mentors, educators, and facilitators of the academic and professional growth of the researcher.

11. Dr. Marvin B. Manayan, a friend and classmate of the researcher who constantly gives advice and comments on her research endeavor and for being always a helping hand throughout her PhD journey.
12. Dr. Edsel R. Francisco and the Gradeonederful Family of Tetuan Central School, for the moral support and trust given to the researcher to realize her full potential and realize the possibilities of her professional growth and career networks.
13. Mr. Charlie M. Tinaytina, the researcher's ever-supportive husband, for his very consistent and wholistic sustenance, encouragement, and trust showed to the researcher to taste the fruit of success and who stood behind the researcher to walk through the challenges and struggles in the conduct of the study.

i. J. C. T.

**References**

1. Abun, D., Magallanes, T., & Al-Mahrouqi, M. (2019). Investigation of Cognitive and Affective Attitude of Teachers toward Research and Their Behavioral Intention to Conduct Research in the Future. Journal of Humanities and Education Development, 1(5), 2581-2651. Doi: 10.22161/jhed.1.5.2ff
2. Academia ERP. (2023). Crisis in Philippines Education: Technology can be a solution. Https://www.academiaerp.com/blog/crisis-in-philippines-education-technology-can-be-a-solution/
3. Academia by Serosoft. (2023). Strategies for motivating teachers: Top 11 strategies to implement. https://www.academiaerp.com/blog/strategies-for-motivating-teachers-top-11-strategies-to-implement/
4. Agatep, M. C., Pagaduan, R. C., & Panganiban, J. M. (2019). Research capabilities among selected graduate school students in the Philippines. Journal of Education and Practice, 10(1), 1-8. Https://doi.org/10.5539/jep.v10n1p1
5. Ahmed, M. A., Ahmed, M. S., & Ahmed, S. (2020). The significant role of technology in conducting the academic research. International Journal of Computer Research & Technology, 10(254), 1-6. Doi: 10.22146/ijcrt. v10i254.1479
6. Alcazaren, M. C., de Leon, J. A., & Tantengco, J. M. (2022). Investigating Filipino school teachers' engagements with research:A bioecological systems case study. In International Journal of Educational Research & Theory (Vol. 32, Issue 1, pp. 1-14). Https://doi.org/10.1177/0141191620963499
7. Almonicar, A. (2022). School Learning Action Cell (SLAC) Program: The Batuan District Experience. https://www.researchgate.net/publication/366397210_School_Learning_Action_Cell_SLAC_Program_The_Batuan District Experience
8. Al-Saraf, M. (2022). The research gap (literature gap): Everything you need to know to find a quality research gap. Grad Coach. https://gradcoach.com/research-gap/
9. Alvarez, R. (2020). Learning from the problems and challenges in blended learning:Basis for faculty development and program enhancement. Asian Journal of Distance Education, 38(1), 1-15. https://files.eric.ed.gov/fulltext/EJ1285361.pdf
10. Alviar, J. (2015). Technology is not a threat but teachers have to adapt. Newsinfo. https://newsinfo.inquirer.net/698656/technology-is-not-a-threat-but-teachers-have-to-adapt#ixzz8B5sEzIWe
11. American Library Association. (2012). DATA COMPETENCIES. Https://www.ripleffect.org/data-pathways/data-competencies/
12. Anderson, M., Jiang, J., and Ling, R. (2018). The positives of digital life. Pew Research Center. https://www.pewresearch.org/internet/2018/07/03/the-positives-of-digital-life/
13. Andrade, R. (2019). A critical review of research on student self-assessment. Frontiers in Education, 4(87), 1-14. Https://doi.org/10.3389/feduc.2019.00087
14. Arangco, R. (2016). Action research aims for educational transformation. https://www.depedmalaybalay.net/articles/action-research-aims-for-educational-transformation
15. Baruah, R. (2012). Effectiveness of social media as a tool of communication and its potential for technology enabled connections: A micro-level study. International Journal of Scientific and Research Publications, 2(5), 1-7 http://www.ijsrp.org/research_paper_may2012/ijsrp-may-2012-24.pdf
16. Bircan, E., Öztürk, N., & Kara, M. (2016). The role of motivation and cognitive engagement in science achievement. Science Education International, 47(3), 385-396. https://files.eric.ed.gov/fulltext/EJ1131144.pdf
17. Calzon (2023) ´ A Guide To The Methods, Benefits & Problems of The
18. Interpretation of Data" https://www.datapine.com/blog/data-interpretation-methods-benefits-problems/

19. Cardona, J. (2023). Guiding principles for creating safe, inclusive, supportive, and fair school climates. http://www2.ed.gov/policy/gen/guid/school-discipline/guiding-principles.pdf
20. Catane, M. (2020). ACTION RESEARCH PROCESS: THE DEPED BRAND. https://www.depedmalaybalay.net/articles/action-research-process-the-deped-brand.html
21. Chase, J. L., D'Angelo, B. A., & Wuest, S. M. (2013). Time management strategies for research productivity. College of Nursing Faculty Research and Publications, 262, 1-12. https://epublications.marquette.edu/nursing_fac/262
22. ChildHope Philippines. (2021). Education issues in the Philippines: The ongoing struggle. Https://childhope.org.ph/education-issues-in-the-philippines/
23. CNN Philippines Staff. (2020). 60 percent of public teachers have yet to be trained in technology-reliant teaching. CNN Philippines, June 25. Https://www.cnnphilippines.com/news/2020/6/25/DepEd-teacher-training-in-technology-based-instruction.html
24. Cutler, J., Creswell, J. D., & Cowie, H. (2022). The role of research in the professional development of graduate teachers. In Monash University, Faculty of Education (Ed.), Teachspace articles (Article 10). https://www.monash.edu/education/teachspace/articles/the-role-of-research-in-the-professional-development-of-graduate-teachers
25. Daim, M., Kocabasak, S., & Kocabasak, E. (2019). The main sources for technology management research: A bibliometric approach. Engineering Technology Management & Innovation Studies, 6(1), 1-12. Https://pdxscholar.library.pdx.edu/etm_fac
26. Data Plus. (2017). Technology in Research, Past, Present, and Future. https://dataplus-research.com/technology-in-research-past-present-and-future/
27. Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. https://orcid.org/0000-0002-6102-4941
28. Dayagbil, C. M. (2021). Teaching and learning continuity amid and beyond the pandemic. Frontiers in Education, 6(67), 678692. Https://doi.org/10.3389/feduc.2021.678692
29. De Guzman, R. (2003). The dynamics of educational reforms in the Philippine basic and higher education sectors. Asia Pacific Education Review, 4(2), 169-181. https://files.eric.ed.gov/fulltext/EJ776349.pdf
30. Dela Cruz, M. (2020). The Untold Story: The Disadvantage of Technology. Sunstar Pampanga, January 31. https://www.pressreader.com/philippines/sunstar-pampanga/20200131/281762746236264
31. Department of Education. (2017) Department of Education Order No. 16: Research management guidelines. Manila, Philippines: Department of Education.
32. Department of Education. (2016). Department of Education Order No. 39: Adoption of the Basic Education Research Agenda. Manila, Philippines: Department of Education.
33. Department of Education. (2003). Institutionalizing research-based decision and policy-making in the Department. Republic Act No. 65. https://www.deped.gov.ph/policies/ra65/
34. Doyle, M. (2020). Consolidating concepts of technology education From rhetoric towards a potential reality [Doctoral dissertation, Stockholm University]. http://www.diva-portal.org/smash/get/diva2:1427616/FULLTEXT01.pdf
35. Elkhatat, M., Alshamlan, M., & Alghamdi, M. (2021). Some students' plagiarism tricks, and tips for effective check. In M. Alghamdi (Ed. ), Proceedings of the 2nd International Conference on Education and Computer Science (pp. 1-6). Riyadh, Saudi Arabia: King Fahd University of Petroleum & Minerals (KFUPM). Doi: 10.1007/s40979-021-00082-w
36. El Semary, M. (2011). Barriers to the effective use of technology in education: Case study of UAE University. Computers & Education, 56(1), 139-147. Https://doi.org/10.1016/j.compedu.2017.03.007
37. Ertürk, M. (2022). The effect of teachers' quality of work life on job satisfaction and turnover intentions. International Journal of Contemporary Educational Research, 9(1), 191-203. Doi: 10.33200/ijcer.1022519
38. Espinosa, R. (2023). Research capability of teachers in public secondary schools in the province of Masbate, Philippines: Basis for enhancement program in psychology and education. Unpublished doctoral dissertation, University of the Philippines Diliman. Https://doi.org/10.26028/upd.theses.0001395
39. Evans, J. (2023). Education Research Tutorial: Step-by-step guide to conducting research in education. https://guides.library.ucmo.edu/c.php?g=141935&p=9291
40. Faculty Development and Instructional Design Center. (2005). Responsible Conduct in Data Management. https://ori.hhs.gov/education/products/n_illinois_u/datama nagement/datopic.html
41. Fechter, J. (2023). Essential Technical Writing Skills [2023]. Technical Writer HQ. https://technicalwriterhq.com/career/technical-writer/technical-writing-skills/

42. Foltýnek, M., Kubáčková, M., & Štěpánková, J. (2020). Testing of support tools for plagiarism detection. International Journal of Educational Technology in Higher Education, 13(1), 1-14. Doi: 10.1186/s41239-020-00192-4
43. Ghamand, A., & Nawaz, M. (2023). Research Skills: What they are and Benefits. QuestionPro Blog https://www.questionpro.com/blog/researchskills/#:~:text=Research%20skills%20are%20the%20capability,i
44. Gonzalez, G. (2006). Using a creativity framework to promote teacher learning in lesson study.
45. https://www.sciencedirect.com/science/article/abs/pii/S1871187117301074
46. Hariharan, M. (2023). 13 Most Popular Tools for Technical Writing. https://document360.com/blog/tools-for-technical-writing/
47. Halverson, L, Jones, A., Schneider, J., & Halverson, E. (2019). Learner Engagement in Blended Learning Environments: A Conceptual Framework. https://www.researchgate.net/publication/333562669_Learner_Engagement_in_Blended_Learning_Environments_A_Conceptual_Framework#pf10
48. Hampshire College. (2022). What is Research? https://www.hampshire.edu/what-research#:~:text=Research%20is%20a%20process%20of,professional%20fields%20and%20academic%20disciplines.
49. Horkoff, E. (2015). Introduction to academic writing. Open Textbook Library. https://opentextbc.ca/writingforsuccess/chapter/introduction-to-academic-writing/
50. Informatics Philippines. (2021). Learning to teach: TEACHnology program for teachers and trainers. https://informatics.edu.ph/learning-to-teach-teachnology-program-for-teachers-and-trainers/
51. Joaquin, M., et al. (2020). The Philippine higher education sector in the time of COVID-19. Frontiers in Education, 5, 576371. https://doi.org/10.3389/feduc.2020.576371
52. Llego, M. (2015). Teaching loads and assignments of public school teachers. https://www.teacherph.com/teaching-loads/
53. Llego, M., et al. (2023). A history of the system of education in the Philippines - Its implication for the present generation. https://www.teacherph.com/history-system-education-philippines/
54. Llorito, C. (2020). Harnessing digital technologies can help Philippines overcome impact of pandemic, hasten recovery. World Bank Blogs. https://blogs.worldbank.org/education/overcome-impact-pandemic
55. Lockwood, R. (2023). 10 technology challenges. Smith, Gambrell & Russell, LLP. https://www.sgrlaw.com/ttl-articles/10-technology-challenges/
56. Magulod, G. (2019). Learning styles, study habits and academic performance of Filipino university students in applied science courses: Implications for instruction.
57. Journal of Technology and Science Education, 9(2), 184-198. (2017). https://doi.org/10.3926/jotse.504
58. Kisselburgh, L., et al. (2022). The Ethics of Privacy in Research and Design: Principles, Practices, and Potential. In A. N. Editor, B. N. Editor (Eds.), Book Title (pp. 123-456). Springer. https://doi.org/10.1007/978-3-030-82786-1_17
59. Lara, R. (2021). Cognitive functioning and social media: Has technology changed us? https://www.sciencedirect.com/science/article/pii/S0001691821001797
60. Malachowski, M. (2017). (Vols. 1-4). SAGE Publications, Inc.https://doi.org/10.4	135/9781483381411
61. Maligalig, D., et al. (2011). Education Outcomes in the Philippines. ADB Economics Working Paper Series No. 199.https://www.adb.org/sites/default/files/publication/28409/economics -wp199.pdf
62. McClure, R. (2023). Developing specific skills, competencies, and points of view needed by professionals in the field most closely related to this course. Fairmont State University. https://www.ideaedu.org/idea-notes-on-learning/developing -specific-skills-competencies-and-points-of-view-needed-by-professionals-in-the-field-most-closely-related-to-this-course/
63. Meek, A. (2022). Strategies For Motivating Teachers: Top 11 Strategies to Implement.https://educationadvanced.com/resources/blog/strategies-for-motivating-teachers-top-11-strategies-to-implement/
64. Miller, E. (2023). What are the benefits of educational research for teachers? Sage Publications.https://uk.sagepub.com/en-gb/eur/what-are-the-benefits-of-educational-research-for-teachers#:~:text=Research%20can%3A,and%2 0networks%20of%20professional%20support
65. Miranda, D. (2021). THE IMPACT OF PARAPHRASING TOOLS ON STUDENTS PARAPHRASING SKILLS

66. https://repository.arraniry.ac.id/id/eprint/20266/1/Desra%20Miranda,%20170203075,%20FTK-PBI,%20085214089391.pdf
67. Molinaro, D. (2022). Netiquette: Rules & Guidelines. Retrieved from https://www.avast.com/c-netiquette
68. News Staff. (2015). What's the No. 1 Technology Complaint from Teachers? https://www.govtech.com/education/k-12/whats-the-no-1-technology-complaint-from-teachers.html
69. Ocampo, L. (2022). Research Productivity for Augmenting the Innovation Potential of Higher Education institutions: An Interpretive Structural Modelling Approach and MICMAC Analysis. https://www.mdpi.com/2199-8531/8/3/148
70. OECD. (2012). Equity and Quality in Education: Supporting Disadvantaged Students and Schools. OECD Publishing.
71. http://dx.doi.org/10.1787/9789264130852-en
72. Okongo, J., et al. (2015). Effect of Availability of Teaching and Learning Resources on the Implementation of Inclusive Education in Pre-School Centers in Nyamira North Sub-County, Nyamira County, Kenya. Journal of Education and Practice. https://files.eric.ed.gov/fulltext/EJ1086389.pdf
73. Olayda, J. (2020). The importance and relevance of the Philippine Professional Standards for Teachers (PPST) to Technology for Teaching and Learning. ttps://olayajodel.wordpress.com/2020/11/11/the-importance-and-relevance-of-the-philippine-professional-standards-for-teachers-ppst-to-technology-for-teaching-and-learning/
74. Patel, A. (2021). The 7 Greatest Challenges Facing Education Technology Today. https://wpgc.io/the-7-greatest-challenges-facing-education-technology-today/
75. Pagán, H. (2018). Behavioral, affective, and cognitive engagement of high school music students: Relation to academic achievement and ensemble performance ratings. https://digitalcommons.usf.edu/cgi/viewcontent.cgi?article=8544&context=etd
76. Qudus, R. (2023). What Is The Importance Of Technology In Research. Research & Writing. https://www.expaat.co/what-is-the-importance-of-technology-in-research
77. Reddy, P. (2016). Why research is important for students, humans, education. https://content.wisestep.com/research-important-students-humans-education/
78. Research Center for Teacher Quality (RCTQ). (2023). Insight: PPST guides use of educational technology in teaching and learning. https://www.rctq.ph/?p=2486
79. Sheldon, P., Bryant, K., Krais, M., & Cintron, R. (2023). Understanding the Relationship between Communication Competence and Social Media Use, Southern Communication Journal, 88(3), 229-239. doi:10.1080/1041794X.2022.2153382. https://www.tandfonline.com/doi/full/10.1080/1041794X.2022.2153382
80. Shields, P., Caro, V., & Church, S. (2023). Equality of Educational Opportunity. The Stanford Encyclopedia of Philosophy. https://plato.stanford.edu/archives/spr2023/entries/equal-ed-opportunity/
81. Silva, A., Reguindin, R., & Ogena, N. (2021). The Importance of Technology in Philippine Education.https://childhope.org.ph/importance-of-technology-in-philippine-education/
82. Smart, C. (2020). How to improve your problem-solving skills and build effective problem-solving strategies. https://www.sessionlab.com/blog/problem-solving-skills-and-strategies/
83. Smith, J. (2023). Teacher research: A collaborative process. https://blog.irisconnect.com/uk/6-ways-to-encourage-teachers-to-become-researchers
84. Sutton, J. (2015). Qualitative research: Data collection, analysis, and management. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4485510/
85. Sword, A. (2020). Effective communication in the classroom: Skills for teachers. https://www.highspeedtraining.co.uk/hub/communication-skills-for-teachers/
86. Tindowen, R., et al. (2019). Teachers' conception and difficulties in doing action research. Universal Journal of Educational Research. www.hrpub.org/download/20190730/UJER17-19513189.pdf
87. Towler, R. (2018). Employee engagement: Definition, benefits and evidence-based practices on how to improve your employees' engagement. https://www.ckju.net/en/dossier/employee-engagement-definition-benefits-and-evidence-based-practices
88. Tucker, C. (2021). Teacher engagement part I: Cognitive engagement in blended learning environments. https://catlintucker.com/2021/12/teacher-cognitiveengagement
89. Ulla, M. (2018). Benefits and challenges of doing research: Experiences from Philippine public school teachers. https://www.iier.org.au/iier28/ulla.pdf

90. Ulla, M., et al. (2017). Philippine classroom teachers as researchers: Teachers' perceptions, motivations, and challenges. file:///C:/Users/Admin/Downloads/publishedClassroomTeachersasResearchers.pdf
91. Villanueva, J. (2013). Implementing rules and regulations of the enhanced basic education act of 2013. https://www.officialgazette.gov.ph/2013/09/04/irr-republic-act-no-10533/
92. Vuckovic, G., et al. (2020). Attitudes towards cheating behavior during assessing students' performance: Student and teacher perspectives. https://edintegrity.biomedcentral.com/articles/10.1007/s40979-020-00065-3
93. Wilbold, A. (2019). Social media in education: Can they improve the learning? https://elearningindustry.com/social-media-in-education-improve-learning
94. Wu, M., et al. (2019). Development and evaluation of affective domain using student's feedback in entrepreneurial massive open online courses. https://www.frontiersin.org/articles/10.3389/fpsyg.2019.01109/full