

## Challenges in Conducting Research in Computer Engineering Program in the New Normal Setup

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### Highlights

- The students perceived that research is relevant to their lives and they can do it even during the pandemic and new normal set-up.
- The students showed sentiments in the conduct of research.

### Abstract

The pandemic period had changed the interest of student-researchers in findings research topics due to the different limitations that the pandemic had imposed. Research writing is one of the challenging works for student-researchers. The descriptive research was utilized to identify the challenges faced by the computer engineering students at FEU Institute of Technology enrolled in research subject. A total of twenty-seven (27) respondents used in the study who responded the online survey regarding their perceptions towards conducting research during the pandemic and new normal set-up. Pearson product moment coefficient of correlation and analysis of variance were utilized to evaluate the significant relationship and differences between independent and dependent variables. The findings reveal that majority of the respondents are male, 23, fourth year level and enrolled in Thesis 1 and 2. The students perceived that research are relevant on their lives and they can do their research activities even during the pandemic period but showed sentiments towards conducting research. The students are worried that research is time-consuming, complicated, and demanding. The correlation result concluded that the sex, age, and year level does not have significant relationship with the perceptions of the students towards conducting research in the online and new normal set-up. Similarly, the analysis of variance showed no significant relationship on all the variables evaluated. The computer engineering department should increase the adviser-student consultation hours to properly guide the student-researchers in their conduct of research.

**Key Words:** challenges; computer engineering; online learning; pandemic; research

### 1. Introduction

Research writing is one of the challenges to the engineering students as part of the final requirement in completing the engineering program. Research itself is a difficult process where students should find a research topic that would address problems in the society. With the onset of the pandemic period, the research agenda was shifted to different topics due to limitations set forth in the online set up of classes. Laboratory rooms and testing centers were closed during the past two years of the pandemic, thus limiting the students to find a topic that is purely descriptive and can only be done in their homes. During the pandemic period due to Corona Virus Disease (COVID 19), the academic institutions hurdle additional

challenges in the online set up of classes, thus the universities had to cope with the changes (Poso et. al, 2021). The study of Poso et. al (2021) focused on the level of competence of civil engineering students during the pandemic period, while the present study is on the challenges experiences by the computer engineering students in conducting research during the new normal set up.

Research is conducted by the students to resolve issues in their field of expertise. Research should be conducted in a scientific manner to address problems in the society with the application of engineering principles to investigate and find solutions (Bocar, 2013). Bocar added that students in research felt that time and stress management disturbs the concentration of the students in conducting research activities. Subia (2022) mentioned that the students conducting research during the pandemic period had felt anxious and stressed and having difficulty in the manuscript writing and consultation with their advisers. The study of Bocar was conducted in the pre-pandemic period, thus differences in the findings were recorded due to different periods of analysis.

The paper focuses on identifying the perceived challenges of conducting research in the department of computer engineering of FEU Institute of Technology. The new normal setup of classes had changed the interests of engineering students on some research topics because of different limitations such as access to other testing centers, agencies and other institution that can help them in the conduct of their research activities. Students from Bachelor of Science in Computer Engineering (BSCpE) were asked on their challenges in conducting research during the first term of SY2022-2023. The findings of the study will be used by the department to investigate measures that will help the students in their research subject. The department will use the findings to mitigate measures in enhancing the capability of the department in handling research activities with the students during the current set of education. The department's research policy will be revisited and will incorporate changes that would address the challenges met by the students.

## **2. Methods**

### *2.1 The respondents*

There are twenty-seven (27) total respondents who participated in the online survey who enrolled in Thesis 1 and 2 subjects during the first term of SY2022-2023. The respondents are all computer engineering students at FEU Institute of Technology. The number of respondents is a total enumeration of the students enrolled in Thesis 1 and 2. The responses of the students will be deemed beneficial in plan of the department to revisit the research policy to further enhance the conduct of research even during the new normal set-up.

### *2.2 Data gathering*

The researchers conducted an online survey involving the students enrolled in Thesis under the computer engineering program during the 1<sup>st</sup> term of SY 2022-2023. The survey was distributed online using Google Forms. The 27 students are enrolled in only one (1) section in Research in Computer Engineering program. Aside from the online survey, the professor in charge conducted a focused group discussion to discuss the difficulties, challenges, and concerns as regards to the conduct of research during the period.

### *2.3 The Research Instrument*

The research questionnaire used in the study was patterned from the study of Subia (2022) where minor modifications were made to fit with the purpose of the current study. The questionnaire is divided into four (4) parts. The first part is the profile of the respondents in terms of sex, age, year level and thesis subject enrolled. The second part composed of questions on the relevance of research on the lives of the respondents.

The third part composed of questions on the capability of the respondents to conduct research and the fourth part are questions on sentiments of the respondents in the conduct of research. The instrument was selected as it reflects the challenges and sentiments of the students in the conduct of research activity during the new normal set up which will be used in the formulation or revision of the department's research policy to address the concerns of the students as regards to their difficulties in research subject.

### 2.4 Scoring and Interpretation

The 4-Likert scale was used in the study where one (1) as the lowest and four (4) as the highest score from strongly disagree, disagree, agree, and strongly agree. Table 1 shows the interpretation criteria for the weighted mean for each of the items in the questionnaire.

Table 1. Interpretation

<b>Weighted Mean</b>	<b>Relevance</b>	<b>Capability</b>	<b>Sentiments</b>
1.00 – 1.50	Strongly Irrelevant	Strongly Incapable	Strongly Disagree
1.51 – 2.50	Irrelevant	Incapable	Disagree
2.51 – 3.50	Relevant	Capable	Agree
3.51 – 4.00	Strongly Relevant	Strongly Capable	Strongly Agree

### 2.5 Statistical Analysis

To describe the data gathered, the descriptive statistics were used. Analysis of variance (ANOVA) was utilized to test the differences of the responses based on the profile of the respondents. Pearson product moment of coefficient correlation test,  $r$ , was used to test the relationship of the dependent and independent variables (Poso and Nebrida, 2022).

## 3. Results and discussion

### 3.1 Basic profile characteristics

Table 2 presents the profile of the respondents. As regards to the sex of the respondents, majority are male with 77.78% while female got 22.22%. The age of the respondents shows that age 23 got 15 or 55.56%. For the year level, 17 or 62.96 are in fourth year while 10 or 37.04% are in their terminal year. Among the respondents, 13 or 48.15% are enrolled in Thesis 1 while 14 or 51.85% enrolled in Thesis 2. The findings reveal that the students in the computer engineering program enrolled in research are majority are males, 23 and in the 4<sup>th</sup> year or terminal year. It can be implied further that computer engineering program is dominated by male students.

Table 2. Profile of the Respondents.

<b>Sex</b>	<b>Number of Respondents</b>	<b>Percentage (%)</b>
Male	21	77.78
Female	6	22.22
<b>TOTAL</b>	<b>27</b>	<b>100.00</b>
<b>Age</b>	<b>Number of Respondents</b>	<b>Percentage (%)</b>
21	5	18.52
22	3	11.11
23	15	55.56
24	2	7.41
25	0	0.00
26	1	3.70

	27	0	0.00
	28	1	3.70
<b>TOTAL</b>	<b>27</b>	<b>100.00</b>	
<b>Year Level</b>	<b>Number of Respondents</b>	<b>Percentage (%)</b>	
4 <sup>th</sup> Year	17	62.96	
Terminal	10	37.04	
<b>TOTAL</b>	<b>27</b>	<b>100.00</b>	
<b>Track</b>	<b>Number of Respondents</b>	<b>Percentage (%)</b>	
Thesis 1	13	48.15	
Thesis 2	14	51.85	
<b>TOTAL</b>	<b>27</b>	<b>100.00</b>	

### 3.2 Perception of students on challenges in conducting of research during the new normal

#### 3.2.1 Relevance of research to the lives of the respondents

Table 3 presents the perceptions of the students in terms of the relevance of research on their lives as a student. The table reveals that item 2 “*I will benefit on my research knowledge*” and 5 “*Research is valuable to me and to every student*” got the highest weighted mean of 3.63 interpreted as strongly relevant. Overall mean is rated 3.52 interpreted as relevant. This implies that even during the pandemic period and in the new normal, the research topics selected by the students in their thesis subject are still relevant to their lives. This is similar to the study of Subia et al. (2022) that the tourism and management students had chosen the topics for their research that are mostly relevant to their lives. This implies further those students, even in the new normal period, will be choosing topics for research that they may find important and will become beneficial as they pursue their career in computer engineering. This can be attributed to the fact the students would apply the recent technology and innovative ideas applying their knowledge and skills in computer engineering.

Table 3. Relevance of research on the lives of the students

No	Relevance	1 SD	2 D	3 A	4 SA	Weighted Mean	Interpretation
1	Research is related to my field of specialization	1	2	8	16	3.44	Relevant
2	I will benefit on my research knowledge	1	0	7	19	3.63	Strongly Relevant
3	Research is useful to my everyday life	0	3	12	12	3.33	Relevant
4	Research skills help me in my future profession	0	1	10	16	3.56	Strongly Relevant
5	Research is valuable to me and to every student	0	1	8	18	3.63	Strongly Relevant
6	Research-oriented students are assets of every country	1	1	7	18	3.56	Strongly Relevant
<b>AVERAGE MEAN</b>						<b>3.52</b>	<b>Relevant</b>

#### 3.2.2 Capability of the respondents in writing their research paper

Table 4 shows the perceptions of the computer engineering students towards their capability in writing research paper during the online and new normal set up. All items were rated capable, and the overall mean is 3.07 interpreted as capable. The result implies that even during the pandemic period and in the new normal, the students are still capable of doing their research activities. The findings are different from the results of the study of Bocar (2013) which highlighted that the item which contributed a very great extent

to the difficulty of the students in conducting their research study is to get a hold on the cooperation of their members. The study of Subia et al (2022) rated the capability as moderately capable only which highlighted that the students are still capable in following the format and layout required for research documentation. This can be implied further that the students still learn the basics of research writing during the pandemic and new normal set up.

Table 4. Capability in writing their research paper

No	Capability	1 SD	2 D	3 A	4 SA	Weighted Mean	Interpretation
1	Choosing a research topic	0	6	13	8	3.07	Capable
2	Picking an appropriate framework	0	7	10	10	3.11	Capable
3	Writing research questions/statement of the problem	0	4	13	10	3.22	Capable
4	Searching for related literature and studies	1	4	12	10	3.15	Capable
5	Paraphrasing, quoting, and referencing	0	2	10	15	3.48	Capable
6	Designing research instruments	0	4	13	10	3.22	Capable
7	Designing research methodology	0	4	13	10	3.22	Capable
8	Identifying sample respondent/participants	0	5	7	12	2.93	Capable
9	Performing data analysis	0	2	12	13	3.41	Capable
10	Interpreting the findings	0	4	9	14	3.37	Capable
11	Writing conclusions and recommendations	0	3	12	12	3.33	Capable
12	Formatting such as correct layouts of tables, margins, spacing etc.	0	3	12	12	3.33	Capable
	<b>AVERAGE MEAN</b>					<b>3.07</b>	<b>Capable</b>

### 3.2.3 Sentiments towards research

Table 5 shows the sentiments of the students in conducting research. It can be gleaned from the table that all items were rated “agree” and the overall mean is 2.93 interpreted as agree. The results implies that students have their sentiments in the conduct of research especially during the pandemic and new normal set-up. Sentiments on time-consuming, makes them worry too much, complicated, demanding and makes them tense are the most rated. The findings of Bocar (2013) revealed that the students felt that personal problems like time and stress management disturbed their concentration in conducting research. The findings of Subia et. al (2022) is similar to that of the present study that students worry to much which conducting research activities. The findings as regards to sentiments of the students can be used by the department in revisiting the research policy to enhance the capabilities of the students in doing research. The department of computer engineering should inculcate to the students the relevance of research to ensure that the students will consider the time spent in research are valuable.

Table 5. Sentiments towards research

No	Sentiments	1 SD	2 D	3 A	4 SA	Weighted Mean	Interpretation
1	Research makes me apprehensive.	3	4	12	8	2.93	Agree
2	Research is very complicated.	2	4	13	8	3.00	Agree
3	Research is demanding	3	2	12	10	3.07	Agree
4	Research is time-consuming	1	3	11	12	3.26	Agree
5	Research makes me worry too much	2	2	11	12	3.22	Agree
6	Research is taxing	2	5	11	9	3.00	Agree
7	Research makes me tense	2	2	12	11	3.19	Agree
	<b>AVERAGE MEAN</b>					<b>2.93</b>	<b>Agree</b>

### 3.6 Statistical analysis result

#### 3.6.1 Correlation results

The analysis used 0.05 level of significance with twenty-seven total of samples and 25 degrees of freedom and results of the correlation analysis is shown in Table 6. The table reveals that the independent variables (gender, age, year level) does not have significant relationship with the perceptions of the students towards conducting research in the online and new normal set-up. This implies further that the gender, age, and year level does not have any relationship to the perception as regards to relevance, capability, and sentiments

Table 6. Correlation result

Variables	r Value	P Value	Interpretation
Gender and Relevance of Research	0.198	0.322	Not Significant
Gender and Capability	-0.040	0.844	Not Significant
Gender and Sentiments	-0.226	0.256	Not Significant
Age and Relevance of Research	0.206	0.388	Not Significant
Age and Capability	0.166	0.305	Not Significant
Age and Sentiments	-0.015	0.409	Not Significant
Year level and Relevance of Research	0.432	0.272	Not Significant
Year level and Capability	0.219	0.330	Not Significant
Year level and Sentiments	0.195	0.837	Not Significant

#### 3.6.1 Analysis of variance results

Tables 7, 8 and 9 present the analysis of variance (ANOVA) results. The ANOVA analyzes the significant difference on the perceptions of the students towards the challenges in conducting research. It can be viewed from the results that the variables sex, age, and year level does not have significant difference on the students' perception. This further implies that whatever sex, age, and year level the student is, the same perception was recorded. Implying further that the computer students enrolled in the current term have the same sentiments and challenges faced in conducting research.

Table 7. ANOVA Table for Sex and the Perception on Challenges in Research

Variables	Source of Variation	SS	df	MS	F	P values
Gender and Relevance of Research	Between Groups	0.012	1	0.012	0.040	0.844 <sup>ns</sup>
	Within Groups	7.355	25	0.294		
	Total	7.366	26			
Gender and Capability	Between Groups	0.438	1	0.438	1.352	0.246 <sup>ns</sup>
	Within Groups	8.093	25	0.324		

	Total	8.53	26			
Gender and Sentiments	Between Groups	1.127	1	1.127	2.251	0.146 <sup>ns</sup>
	Within Groups	12.518	25	0.501		
	Total	13.645	26			

*Note: ns – not significant*

Table 8. ANOVA Table for Age and the Perception on Challenges in Research

Variables	Source of Variation	SS	df	MS	F	P values
Age and Relevance of Research	Between Groups	1.377	5	0.275	0.965	0.461 <sup>ns</sup>
	Within Groups	5.990	21	0.285		
	Total	7.366	26			
Age and Capability	Between Groups	1.083	5	0.217	0.611	0.693 <sup>ns</sup>
	Within Groups	7.447	21	0.355		
	Total	8.53	26			
Age and Sentiments	Between Groups	3.458	5	0.692	1.426	0.256 <sup>ns</sup>
	Within Groups	10.187	21	0.485		
	Total	13.645	26			

*Note: ns – not significant*

Table 9. ANOVA Table for Year Level and the Perception on Challenges in Research

Variables	Source of Variation	SS	df	MS	F	P values
Year level and Relevance of Research	Between Groups	0.354	1	0.354	1.261	0.272 <sup>ns</sup>
	Within Groups	7.013	25	0.281		
	Total	7.366	26			
Year level and Capability	Between Groups	0.324	1	0.324	0.987	0.330 <sup>ns</sup>
	Within Groups	8.206	25	0.328		
	Total	8.530	26			
Year level and Sentiments	Between Groups	0.024	1	0.024	0.043	0.837 <sup>ns</sup>
	Within Groups	13.621	25	0.545		
	Total	13.645	26			

*Note: ns – not significant*

#### 4. Conclusions

The descriptive research was utilized to identify the challenges faced by the computer engineering students at FEU Institute of Technology enrolled in Thesis 1 and 2 in the first term of SY 2022-2023. There are twenty-seven respondents responded the online survey regarding their perceptions towards conducting research during the pandemic and new normal set-up. Correlation test and analysis of variance were utilized to assess the significant relationship and differences between independent and dependent variables. The data on respondents' profiles reveals that majority are male, twenty-three fourth year level and enrolled in Thesis 1 and Thesis 2. The students perceived that research are relevant on their lives as a student. The paper concluded that even during the pandemic period and in the new normal, the students are still capable of doing their research activities but showed their sentiments towards conducting research. It is concluded that students have their sentiments on time-consuming, makes them worry too much, complicated, demanding

and makes them tense. The correlation result concluded that the sex, age, and year level does not have significant relationship with the perceptions of the students towards conducting research in the online and new normal set-up. Similarly, the analysis of variance showed no significant relationship on all the variables evaluated. It is recommended that the computer engineering department should increase the adviser-student consultation hours to properly guide the student-researchers in their conduct of research. It is also recommended that a continuation of the study will be conducted analyzing the research topics/domain during the f2f and during the new normal.

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