



TPACK IN  
PHILIPPINE  
STEAM  
EDUCATION

# GRADUATE MENTORING PROGRAM

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# BACKGROUND OF THE STUDY

## Industry 4.0 and Education 4.0

Teaching becomes a challenging enterprise that requires **creativity** in implementing **appropriate teaching strategies** to create positive attitude and life-long learning experiences (Xing & Marwala, 2014).

# BACKGROUND OF THE STUDY

Students become *more concerned* and *involved* in making their own curricula with emphasis on content and durability of their study programs.

- The teacher together with the institution become major players to academic performance (Dunwill, 2016).
- *Mentoring* becomes essential in determining student's success.

# BACKGROUND OF THE STUDY

## What is mentoring?

- **Mentoring** is a **distinct** human experience. Similar to leader-follower relationships that **imply raising one another to higher levels of morality and motivation** (Burns, 1978)
- Mentoring appears to have the essential attributes of ... a supportive relationship; a helping process; a teaching-learning process; a reflective process; a career development process; a formalized process; and a role constructed by or for a mentor (Roberts, 2000)

# BACKGROUND OF THE STUDY

## The Value of Mentoring

The central principle is that **learning, change,** and **transformation** occur through the relationship with a coach or a mentor (Connor & Pokora, 2012)

# BACKGROUND OF THE STUDY

## Reasons for Mentoring

- Meet the requirements of the organization
- Address the learning needs of the mentee, matched to the mentor's competence, capability, and preference

( Ghosh, 2014)

# DESCRIPTION OF THE GRADUATE MENTORING PROGRAM

## What is Graduate Mentoring Program?

It is an **emerging program** founded by the research TPACK core team in Philippine Steam Education. It successfully began in **February 2018** and voluntarily participated in by **graduate students** from leading and collaborating higher education institutions nationwide.

# OBJECTIVES

- Develop collaborative practice and collaborative action through mentorship and apprenticeship.
- Strengthen research skills to create a culture of research and reflective practice in order to contribute to the country's knowledge economy.



# FOCUS OF MENTORING

- Protocols of class observation and interview
- Government processes related to financial liquidation
- Transcription of Interview and observation
- Coding mechanisms and systems

# DESCRIPTION OF SERVICES

- Observed voluntary and active participation in the program
- Conducted data gathering (classroom observations and interview sessions)
- Completed expected tasks for the mentoring program (transcribing, coding, analyzing set of data, attending meeting and scheduled workshops)
- Submitted complete liquidation report of expenses

# METHODS

# RESEARCH DESIGN

## PARTICIPATORY ACTION RESEARCH

**Participatory Action Research** is seen in many researches to benefit the education field by fostering collaborative perspective characteristics of action research. This research design seeks *to bring together action and reflection, theory and practice, in participation with others*, in pursuit of practical solutions to issues of pressing concerns to people, and more generally the flourishing of the individual and their communities (Reason & Bradbury, 2001 p. 1)

# An Overview of Participations/Involvements of Graduate Student Volunteers

## Data Collection

Pre-observation  
Class Observation  
Interview Session  
Voice Recording  
Data Safe  
Keeping  
Transcribing of  
Voice Records

## Data Analysis

2 3-Day Seminar  
Workshops on  
Data Coding  
Memoing  
Using MAXQDA  
(Qualitative  
Analysis)

## Junior Graduate Students Mentoring

**Speakership**  
(Meeting and Seminar Work-shop)  
**Mentoring Sessions**  
(Data Gathering Procedures and  
Data Coding)

## Event/Program Facilitations

**Capability Building  
Program**  
**National Forum for  
STEAM in Higher  
Education**

# Participation in Data Collection (Components 2-4)

## During the Pre-Observation

- Assured that **STEAM Faculty** and **STEAM Administrator Participants** have signed the Consent Form
- Collected **Pre-Observation** and the **Session Guides Forms**

# Participation in Data Collection (Components 2-4)

## During the Class Observation

- Took notes on the class proceedings of the STEAM Faculty
- Rated **STEAM Classroom Observation** based on the three domains
- Accomplished **TPACK Classroom Observation Notes**
- Assured that the observed STEAM Faculty had accomplished the **Technology Integration and Assessment Checklists**

# Participation in Data Collection (Components 2-4)

## During the Interview Session

- Assisted the Collaborator in the conduct of interview sessions
- At times, conducted Interview Sessions with the STEAM Administrators and Faculty (Audio Recorded)



# Participation in Data Collection (Components 2-4)

## Data Safe Keeping

- Assured the safety of all the voice records, data observation sheets, observation Checklist and Reflection notes all in one kit
- Surrendered the Data Gathering Kit to the Technical Assistants of the research project

# Participation in Data Collection (Components 2-4)

## Transcribing of Interview Sessions' Voice Records

Transcribed the  
Voice Records  
(Not all, as some  
were transcribed  
by Graduate  
Students)

Sample  
Transcript

For being an administrator, how would you assess your teachers being able to be good steam teachers?

You would like to ask me the efficiency of my teachers here?

Yes maam in terms of being steam teachers.

We have just started the k-12 we will be graduating the first group of senior high this march. If would say that my evaluation with my teachers integrating with that's nursing with science in their teaching, I would say that they really do can be capable of doing it. Why I see that? All my teachers are master \*\*\*

Yes whenyou say they can be capable they still have the potential? But your still working with the eampar or the engineering agriculture par?

We have one college and that is nursing.

That's why it is usually for science

What indicators do you say maam that they are really capable of or they can be really capable of what indciators do you have in mind that you can say. Aside from having a master's degree which is one indicator. Can you think of some indicator in yourmind that let you say they are capable of being?

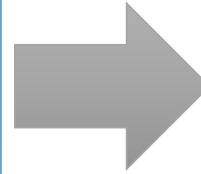
They were experienced before we hired them. \*\*\*\* clinical instruction. Some of them have been working in other institutions so I like to say that we hire them they have already an experience. Right now because you are asking me that question all of them the four clinical instructors right now that I am having have been with me for ten years. They came here of course they are not master's degree. Their interest was on teaching I would say that because they would to deviated to finish master's degree. That is one indicator that I want to say. It can integrate. Aside from that \*\*\*\* they have been honor students among them. 50%.

How about nowadays, we have a lot of information being shared on the internet or also information coming from the social media and even on conferences and seminar that they \*\*\*\* how do you guide them? How do you guide your teachers in terms of academic integrity on how to share knowledge?

# Involvement in Data Analysis

## DATA CODING AND MEMOING

Attended 2 3-Day  
Seminar Workshops for  
Data Coding (Qualitative  
Analysis)



Coded and  
memoed all the  
transcripts

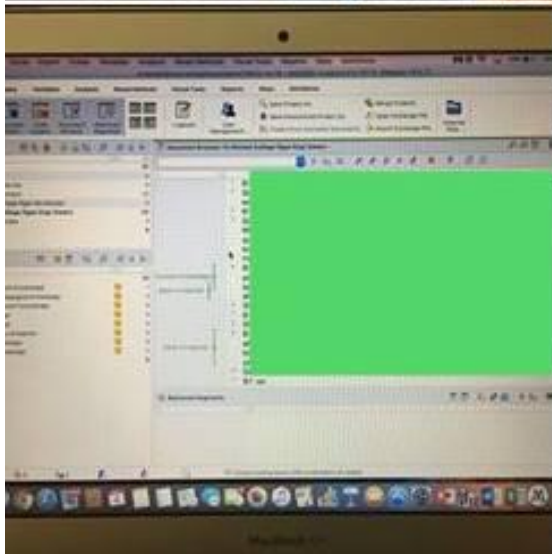


Submitted these to the  
Research Collaborators for  
consolidation and analysis

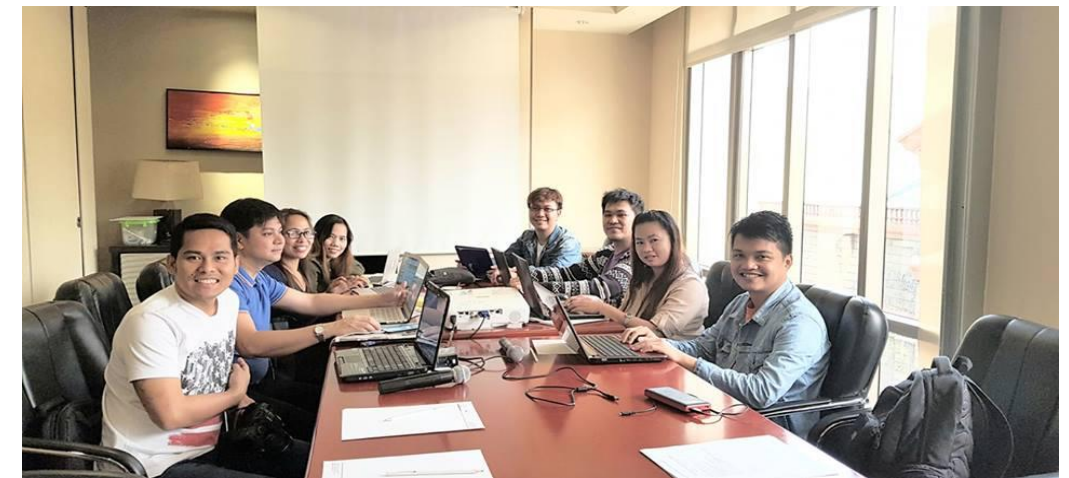
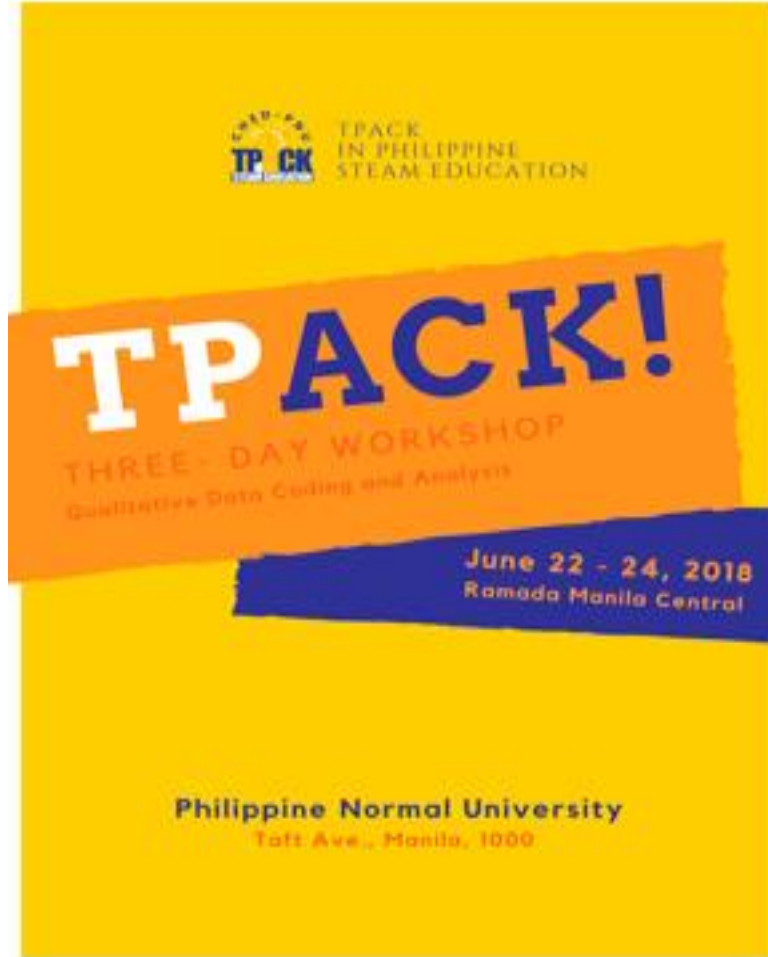
# Involvement in Data Analysis



QUALITATIVE DATA ANALYSIS  
AND WORKSHOP  
(TPACK IN PHILIPPINE STEAM EDUCATION)  
MAY 3-5, 2018



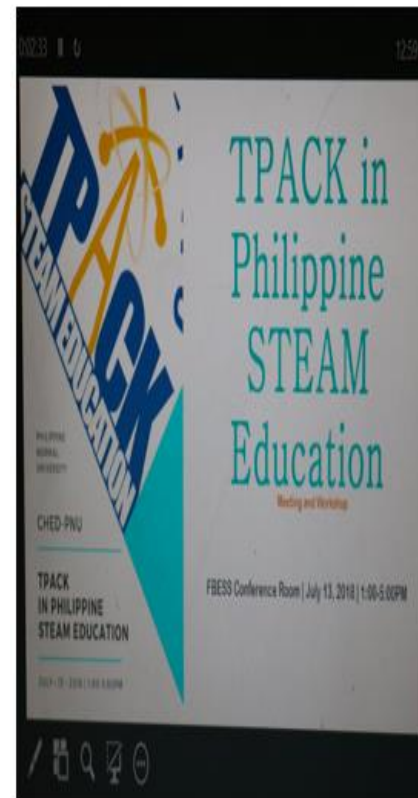
# Data Collection of Component 2-4



# Involvement In The Mentoring Program for Data Collection

## Mentoring The Juniors Graduate Student Mentees

- Served as Resource speakers on Mentoring and Workshop on Data Gathering and Data Coding
- Conducted mentoring sessions with them outside PNU
- Collaborated with the Technical Assistant (Nica Casilla for their Data Gathering Schedules)



# Tasks of Graduate Participants in the National Capability Building Program

- Facilitated the presentation of the research collaborators and the break out sessions of the four clusters in Crafting Lesson Exemplars
- Facilitated in the **Two-rounds of Peer Review** of the Crafted Lesson Exemplars and their Presentations

# Tasks of Graduate Participants on the National Forum for STEAM in Higher Education

- Worked with /assisted the technical team, and
- Some served as presenters of this Graduate Mentoring Program (A Participatory Action Research) as one of the project outputs



# PARTICIPANTS

- Eight Senior Graduate Mentees/Mentors
- Ten Junior Graduate Student Mentees

# CRITERIA AS A VOLUNTEERED GRADUATE PARTICIPANTS (RECIPIENTS)

## **For Doctoral Student**

- ✓ Taking Ph.D. Science Education or Mathematics Education
- ✓ Enrolled in Dissertation Writing/Any research class
- ✓ Willing to conduct data collection in places outside Metropolis
- ✓ Articulate

# CRITERIA AS A VOLUNTEERED GRADUATE PARTICIPANTS

## **For Masters Student**

- ✓ Specializing any STEAM Disciplines
- ✓ Has a good standing in his/her graduate studies
- ✓ Currently enrolled in a research class or thesis writing stage
- ✓ Willing to works as research assistant of senior graduate students

# INSTRUMENTS

- Graduate Reflection for Data gathering
- Graduate Reflection for Workshop

# INSTRUMENTS

## Graduate Student Reflection

Project Title _____		Research Collaborator/Researcher from Lead University: _____	
<b>Travel Details:</b>			
<ul style="list-style-type: none"> <li>• Visited HEI: _____ Date(s) of Visit: _____</li> <li>• Officials Interviewed: _____</li> <li>• STEAM Teachers Observed: _____</li> <li>• Subjects Observed: _____</li> </ul>			
<b>Details of Reflection</b>			
<i>(Please narrate your entire experience during the school visit underscoring all insights gained and learnings from your involvement in the project through all conducted activities)</i>			
Interview with School officials			
Pre-Interview with STEAM Teachers			
Classroom Observation			
Post-Interview with STEAM Teachers			

## Graduate Student Evaluation

*(Graduate Students will be asked to reflect on the whole process of their professional learning, guided by a series of reflective questions.)*

What have I learned from this research project involvement?	
How my students and my school could benefit for this involvement?	
What were the challenges I experienced during the conduct of all activities relative to the research project?	
What aspects of my involvement in this project which I would like to keep?	
What aspects of my involvement in this project which I think I need to improve?	
What learning experiences which I consider have enhanced my research skills as a graduate student?	
Where to from here?	

# INSTRUMENTS

*The National Center for Teacher Education*  
Manila

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Comments/Suggestions

Submitted by:

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**Graduate Student Research Volunteer**  
(Signature over printed name)

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Date

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# INSTRUMENTS

## REFLECTION TEMPLATE



Details of Reflection	
Workshop with the entire Research Team (Researchers and Senior Graduate Students)	
Topics included in the Workshop	
Graduate Student Evaluation	
What have I learned from this workshop?	
How my students and my school could benefit for this involvement	
What were the challenges I experienced during the mentoring process?	
What aspects of the mentoring process helped me as an intending researcher?	
What aspects of my involvement in this project which I think I need to improve?	
What learning experiences have enhanced my research skill as a graduate student?	
Where to from here?	
Comments/Suggestions:	

# DATA COLLECTION

- **Graduate students were asked to accomplished the Graduate reflection sheets**
- **Compilation of reflection for analysis**
- **Documentation**



# SAMPLE ACCOMPLISHED REFLECTION

**GRADUATE REFLECTION FOR** *Workshop*

**SAMPLE ACCOMPLISHED FORM**

**Graduate Student Reflection**

Project Title: Technological Pedagogical Assessment  
 Content Knowledge (TPACK) in Philippine STEAM Education  
 Senior Graduate Student Mentor: **RAGUEL A. GONZALES**

Group/Research Cell Description  
**TPACK STEAM EDUCATION**  
 Workshop on Qualitative Data Analysis  
 July 13, 2018 1:00PM to 5:00PM

**Details of Reflection**  
 (Please narrate your entire experience during the mentoring process)

Workshop with the entire Research Team (Researchers and Senior Graduate Students)	The senior graduate student-researchers are very generous in providing inputs and tips on the future research tasks of the junior student-researcher.
Topics included in the Workshop	I enjoyed listening on the lecture about recording and transcriptions and coding system because I found qualitative research "easy but taskful" However, I am very willing to know and learn the technical know-how of qualitative research and to be a contributor in this CHED national funded research.

**Graduate Student Evaluation**  
 (Graduate Students will be asked to reflect on the whole process of their professional learning, guided by a series of reflective questions.)

What have I learned from this workshop?	I have learned that doing qualitative research is easy but as a researcher, I must be diligent in conducting it for me to be effective and efficient during the recording, transcribing, coding, and liquidating process.
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Philippine Normal University  
 The National Center for Teacher Education  
 EDUCATIONAL POLICY RESEARCH AND DEVELOPMENT CENTER  
 Taft Avenue, Manila 1000, Philippines  
 Tel/Fax: (632) 527-0366; 317-1768, Loc. 711 e-mail: eprdc@pnu.edu.ph

**Graduate Student Evaluation**  
 (Graduate Students will be asked to reflect on the whole process of their professional learning, guided by a series of reflective questions.)

What have I learned from this research project involvement?	✓ Though the observation phase was not implemented, I found my involvement essential on the delivery of the project purpose. In a personal note, my skills as a qualitative researcher was honed.
How my students and my school could benefit for this involvement?	• Since I am handling research class in my home school, the skills & knowledge I got/acquired will be beneficial in teaching the subject and in doing researches.
What were the challenges I experienced during the conduct of all activities relative to the research project?	- In the interview phase, I had difficulty in communicating the questions to the respondents since they have a different perspective or frame of reference, that is why I had to simplify the questions and add probing questions.
What aspects of my involvement in this project which I would like to keep?	- In the conduct of this research, I had the chance of meeting colleagues in the profession whom I consider produce. Rumor has it that they gave me the chance as well to go abroad since my country through the research objectives.
What aspects of my involvement in this project which I think I need to improve?	→ To overcome my being disorganized & forgetful in delivering the expected outcomes like the accomplishment of the forms/documents.
What learning experiences which I consider have enhanced my research skills as a graduate student?	→ As a graduate student, I was given the chance to apply the theoretical skills/knowledge I acquired during the program. I was able to see the real picture, challenges & problems of conducting qualitative study.

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**Where to from here?**

With the knowledge and skills I acquired, I am looking forward to a more or productive research engagements with my learning institutions & to deliver quality research services to my future students.

**Comments/Suggestions**

→ For other field researcher who has no experience in conducting qualitative research to be provided mentoring session most especially on quality research protocol so as to observe smooth research conduct.

Submitted by: \_\_\_\_\_

# DATA ANALYSIS:

- Consolidation of Graduate Students Reflections
- Coding of the reflection notes using MAXQDA 2018

# RESULTS AND DISCUSSION

# RESULTS & DISCUSSION

**Reflections** of graduate students who were involved in data collection:

1. Challenges
2. Benefits

# RESULTS & DISCUSSION

## Reflections: **Challenges**

- **Self-confidence**

*“My blood ran cold as I initially faced them, but eventually I realized that I have to establish confidence doing it”*

# RESULTS & DISCUSSION

## Reflections: **Challenges**

- **Communication skills:**

*“I also stuttered and still nervous in asking questions to the interviewee.”*

*“In the interview phase, I had difficulty in communicating the questions to the respondents since they have different perspectives or frame of reference. that is why I had to simplify the questions and add probing questions.”*

# RESULTS & DISCUSSION

## Reflections: **Benefits**

- Professional practice leading to becoming an improved and holistic researcher:

**T**-echnical improvement

**P**-rofessional improvement

**A**-cumen (research) improvement

**C**-haracter (teacher-researcher) improvement

**K**-nowledge (pedagogical) improvement

# RESULTS & DISCUSSION

## Reflections: **Benefits**

- Professional practice leading to becoming an improved and holistic researcher:

**T**-echnical improvement: **Strengthens research skills**

**P**-rofessional improvement: **Develops network and linkages**

**A**-cumen (research) improvement: **Use of technology in research**

**C**-haracter improvement: **Enhance the teacher-researcher character**

**K**-nowledge improvement: **Learn best pedagogical practices**



# RESULTS & DISCUSSION

## Reflections: **Benefits**

- Personal practice leading to valuing and improving self-worth as :

**S**-ystematic

**T**-ask-oriented

**E**-ngaged

**A**-ccurate

**M**-indful

# CONCLUSIONS AND

# RECOMMENDATIO

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# CONCLUSION & RECOMMENDATION

- A mentoring program of research apprenticeship equip mentees with necessary training and skills to undertake research
- The graduate mentoring program using PAR provides appropriate lens in drawing reflective practice as it immerses researchers in the fieldworks.

# CONCLUSION & RECOMMENDATION

- A culture of research and reflective practice may be addressed by mentoring, thus, a plan of action can be crafted to reinforce future research programs.
- The congruent frame of TPACK mentoring program may be mirrored and benchmarked, hence, it can be utilized as springboard in future projects to train and capacitate young and budding researchers.

THANK YOU!