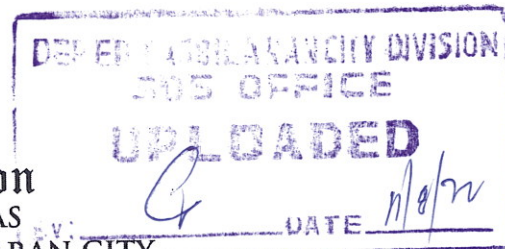




Republic of the Philippines  
**Department of Education**  
REGION VII - CENTRAL VISAYAS  
DIVISION OF CITY SCHOOLS - TAGBILARAN CITY



**Office of the Schools  
Division Superintendent**

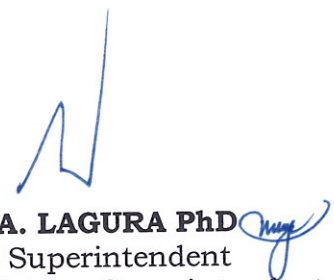
**November 07 2022**

DIVISION MEMORANDUM  
No. 402, s. 2022

**UP CMCFI RESEARCH SURVEY**

To: Chief, CID and OIC, SGOD  
Secondary School Heads  
All Others Concerned

1. Attached herewith the Regional Memorandum No.0915 s.2022, relative to the request of UP College of Mass Communication Foundation Inc.(UP CMCFI) to conduct online survey in the region in line to their study titled : Appreciating Science: A Project on the Inclination and Decision of Filipino K11 to K12 Students in the Philippines to Pursue Science in College/University and as a Career Path( Year 3).
2. The study aims to look into the inclination and decision of Filipino senior high students Grades 11 to 12 students to pursue Science in chosen college/university and as a career path.
3. Participation of teachers and students during the interview should not disrupt classes and in no case that teachers and students identified to participate in the interview shall be pulled out while attending to their classes.
4. For further concerns, please contact Ms. Rissa Silvestre, Executive, Executive Director, UP CMCFI or Ms. Katrina Ramos, UP CMCFI Assistant on [upcmcfi@gmail.com](mailto:upcmcfi@gmail.com).
5. Immediate dissemination of this Memorandum is desired.



**JOSEPH IRWIN A. LAGURA PhD**  
Schools Division Superintendent  
Office of the Schools Division Superintendent

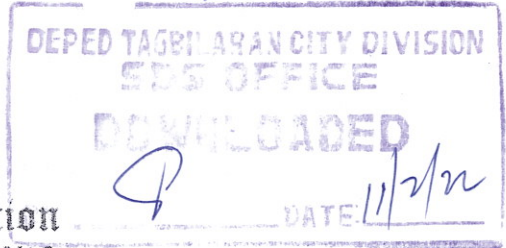
JIAL/CPC/SGOD/FCT/mapd



Address: Dampas District, Tagbilaran City, Bohol  
Telephone Nos.: (038)427-1702; (038)427-2506; (038)422-8177; (038)427-6718; (038)544-2147  
Email Address: [tagbilarancity.division@deped.gov.ph](mailto:tagbilarancity.division@deped.gov.ph)



Republic of the Philippines  
**Department of Education**  
 REGION VII - CENTRAL VISAYAS



Office of the Regional Director

NOV 02 2022

REGIONAL MEMORANDUM

No. 0915, s. 2022

**UP CMCFI RESEARCH SURVEY**

To: **Schools Division Superintendents**  
**All Others Concerned**

*main memo  
 next steps*

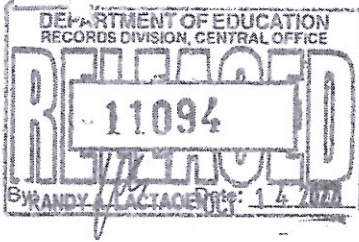
1. Attached herewith the Memorandum from Atty. Revsee A. Escobedo, Undersecretary for Governance and Field Operations, relative to the request of UP college of mass communication foundation, Inc. (UP CMCFI) to conduct online survey in the region in line to their study titled "Appreciating Science: A Project on the Inclination and Decision of Filipino K11 to K12 Students in the Philippines to Pursue Science in College/University and as Career Path (Year 3). Participation of teachers and students are needed to carry out the agenda of the research.
2. It is emphasized that classes shall not be disrupted during the interview and in no case that the teachers and students identified to participate in the interview shall be pulled out while attending to their classes.
3. For further concerns, please contact Ms. Rissa Silvestre, Executive Director, UP CMCFI or Ms. Katrina Ramos, UP CMCFI Assistant on upcmcfi@gmail.com.
4. Immediate and wide dissemination of this Memorandum is desired.

**SALUSTIANO T. JIMENEZ JD, EdD, CESO V**  
 Director IV

Pprd/22



Address: Doña M. Gaisano St., Sudlon, Lahug, Cebu City  
 Telephone Nos.: (032) 231-1433; (032) 414-7399  
 Email Address: region7@deped.gov.ph





Republic of the Philippines  
**Department of Education**  
OFFICE OF THE ASSISTANT SECRETARY  
FOR GOVERNANCE AND FIELD OPERATIONS

OASGFO No. 2022-014

**MEMORANDUM**

TO : **REGIONAL DIRECTORS**  
(Regions I, III, V, VI, VII, VIII, IX, XI, XII, and NCR)

FROM :   
**Atty. REVSEE A. ESCOBEDO**  
*Undersecretary*  
Governance and Field Operations

  
**FRANCIS CESAR B. BRINGAS**  
*Assistant Secretary*  
Governance and Field Operations

SUBJECT : **Request of the UP College of Mass Communication Foundation, Inc. (UP CMCFI) for Endorsement of the Research Study Titled, "Appreciating Science: A Project on the Inclination and Decision of Filipino K11 to K12 Students in the Philippines to Pursue Science in College/University and as a Career Path (Year 3)"**

DATE : **September 13, 2022**

This Office respectfully endorses the attached email letter addressed to Vice President and Secretary Sara Z. Duterte, from Dr. Aleli Agoncillo-Quirante, Ph.D., Research Consultant, UP College of Mass Communication Foundation, Inc. (UP CMCFI), dated September 8, 2022, regarding the request of UP CMCFI for the endorsement of the Research Study titled, "Appreciating Science: A Project on the Inclination and Decision of Filipino K11 to K12 Students in the Philippines to Pursue Science in College/University and as a Career Path (Year 3)." In partnership with the Department of Science and Technology – Science Education Institute, the study aims to look into the factors that influence learners to pursue Science in tertiary education and as a profession.

For queries and concerns, kindly contact Ms. Katrina Ramos at (+632) 8951-8500 local 2678 or email the UP College of Mass Communication Foundation, Inc. (UPMCFI) at [up.cmcfi@gmail.com](mailto:up.cmcfi@gmail.com).

For further details, please see attached file.

For your reference and appropriate action.

Thank you very much.

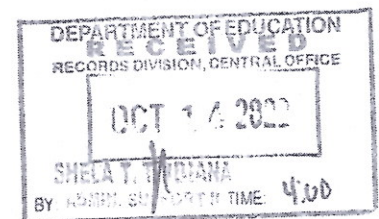
**Copy Furnished:**

**SARA Z. DUTERTE**

*Vice President and Secretary*  
Department of Education

**ALELI AGONCILLO-QUIRANTE, Ph.D.**

*Research Consultant*  
UP CMCFI  
[aleli.quirante@gmail.com](mailto:aleli.quirante@gmail.com)



9/9/22, 8:17 AM

Department of Education Mail - Fwd: request for endorsement of DOST STEM-UPCMCFI, INC. PROJECT



Office of the Assistant Secretary for Governance and Field Operations  
<asec.gfo@deped.gov.ph>

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**Fwd: request for endorsement of DOST STEM-UPCMCFI, INC. PROJECT**

1 message

Office of the Secretary <osec@deped.gov.ph>

Fri, Sep 9, 2022 at 8:01 AM

To: "Office of the Assistant Secretary for Project Management, BHROD and Field Operations" <oure@deped.gov.ph>, asec.gfo@deped.gov.ph

Good day!

This is to respectfully refer to your Office the following correspondence for appropriate action, subject to existing rules, regulations, and requirements. We are forwarding this matter to your good office, since it appears that the request falls under the mandate of your office.

Please inform the proponent of any action undertaken on the matter. It is also requested to copy furnish the Office of the Secretary in all correspondences relative to the raised concern, as it is essential for us to provide the necessary updates to our clients.

Kindly acknowledge receipt of this email.

Thank you.

Sincerely,

**Office of the Secretary**

*Department of Education*

*DepEd Complex, Meralco Avenue, Pasig City*

*Tel. No.: (+632) 687-4177, 633-7208, 687-2922*

*Fax No.: (+632) 637-6209*

*www.deped.gov.ph*

**Office of the Secretary**

*Department of Education*

*DepEd Complex, Meralco Avenue, Pasig City*

*Tel. No.: (+632) 687-4177, 633-7208, 687-2922*

*Fax No.: (+632) 637-6209*

*www.deped.gov.ph*

----- Forwarded message -----

From: Aleli Quirante <aleli.quirante@gmail.com>

Date: Thu, Sep 8, 2022 at 9:16 AM

Subject: request for endorsement of DOST STEM-UPCMCFI, INC. PROJECT

To: <osec@deped.gov.ph>

Secretary Sara Z. Duterte-Carpio

Department of Education

DepEd Complex, Meralco Ave.

Pasig, Metro Manila

**Subject:** Request for Endorsement of the DOST Science Education Institute -UPCMCFI Foundation, Inc. Research Project

Dear Secretary Duterte-Carpio:

Congratulations on your election as Vice President of the Philippines and Secretary of Education

We are from the U.P. College of Mass Communication Foundation, Incorporated (UPCMCFI), a private, non-stock, and non-profit domestic foundation established in providing continuing training, coaching, and mentoring to mass communication educators and practitioners. It undertakes projects on communication and media education, the development, promotion, and enhancement of communication and media education, communication and media research, and other communication and media related activities geared toward national development goals. Since its incorporation in March 1987, the UPCMCFI handles projects and programs to advance the knowledge of communication both as a science and as an art and to foster better understanding of its functions in national development, regional cooperation and international understanding. Among the flagship programs of the Foundation are the promotion of media and information literacy, digital literacy, health literacy, and the development and promotion of creative and critical media use. It collaborates and forge cooperations with local and foreign institutions, public or private organizations, and government and non-government agencies in conducting research projects and activities, training programs, seminars, workshops, symposia and conferences aimed at the promotion, propagation and enhancement of communication and media education.

In 2019, the Department of Science and Technology Science Education Institute (DOST-SEI) commissioned the Foundation to conduct a Three-Year Project on the Perception of STEM Among

Filipino Grades 3 to 12 Students in the Philippines (2020 to 2022).

The Year 1 study conducted from 2020 to 2021, examined the levels of appreciation and the relevance of Science in the academic pursuits of grade K3 to K6 students that could influence them to pursue a Science career or Science-related endeavors. The Year 2 study from 2021 to 2022, focused on the Perception and Inclination of Filipino K7 to 10 Students in the Philippines to Pursue Science Tracks.

The study is now in Year 3, where the focus is on the Inclination and Decision of Filipino K11 to K12 Students in the Philippines to Pursue Science in College/University and as a Career Path.

The following concerns has prompted the pursuit of this thee-year study:

1. The 2019 worldwide study of the OECD Programme for International Student Assessment (PISA), which covered member and non-member states showed that out of seventy-nine (79) countries, the Philippines scored the lowest in reading comprehension and the second lowest in mathematics and science. This necessitated comprehensive research on Filipino K3 to K12 students to understand why Filipino students' performance in Science and Math is below par, so that decision-makers, specifically DOST-SEI and the Department of Education together with other concerned government agencies, could solve the situation at hand (UPCMCFI Year 1 Report, 2020). The results of the three-year research will be the bases for the development of a communication and media plan to promote science among Filipino students.
2. There is the concern from sectors of society including the Department of Education and the DOST, to address the problem of the decreasing number of Science-inclined students and Science practitioners. It is imperative to study the perception of Science among Filipino students and develop ways in which they will take an interest in the said subject and pursue Science in tertiary education and as a profession.

The UPCMCFI obtained Department of Education endorsements from former Department Secretary Leonor Briones for Year 1 (K3 to K6), Year 2 (K7 to 10), and Year 3 (K11 to 12). However, it may be necessary to request endorsements from you as the new Department of Education Secretary to be sent to the Regional Directors and Department of Education Superintendents in the research sample areas.

The study areas are: the National Capital Region (Quezon City, Marikina City and Makati City), Luzon (Region I, III, and V), Visayas (Region VI and VII), and Mindanao (Region VIII, IX, XI, and XII). Two schools from each region - one (1) public high school and one (1) private high school were selected.

In the first two years of the study, both quantitative method and qualitative data were obtained and triangulated. A structured questionnaire for the survey using Google form was pretested before it was finalized and administered through Zoom, Messenger, and mobile phone, while guide questions were constructed for the key informant interviews (KII) with school principals and Science teachers, and Focus Group Discussions (FGDs) among students. These too were pretested prior to data collection. For this third year of the study, because of the face-to-face classes starting this month, data gathering might be done face-to-face too depending on the mode adopted by the schools for the present school year.

The results of the Year 1 study were presented to the DOST-SEI on August 26, 2021 in the Online Roundtable Discussion on Grade School Students' Perception of STEM entitled "Kwela pa ba ang Syensiya?" It was attended by DOST Secretary Fortunato Dela Peña, USEC for S&T Services, Dr. Renato Solidum, Department of Education USEC Diosdado San Antonio, Master Teacher Ms. Mary Grace Bumanlag, and Raya School Owner Dr. Carlo Primo David. Additionally, school representatives and invited members of the media attended. The ABSCBN coverage of the RTD was telecast on September 5, 2021 ([https://youtu.be/lnKmJ5Ps\\_G8](https://youtu.be/lnKmJ5Ps_G8) [starts at 39 or 40-minute mark]) The results of the study were presented by the UPCMCFI Team headed by Dr. Arminda V. Santiago, Dr. Lourdes M. Portus, and Dr. Aleli A. Quirante.

On September 15, 2022, the UPCMCFI Research Team will present the results of the Year 1 study at the Seventh National Research and Development Conference (NRDC). This is upon the invitation from the DOST Office of the Undersecretary for Research and Development and will be held at the Reception Hall, PICC, Pasay City.

With these facts about the three-year study and its being on the 3<sup>rd</sup> Year, we reiterate our humble request for endorsements from you as the new Department of Education Secretary to be sent to the Regional Directors and Department of Education Superintendents in the research sample areas.

We have included in this request letter the details of the project and documents pertinent to it. We also sent a hard copy to your office and usb about the project.

We hope for your most favorable response to this request.

Respectfully,

Aleli Agoncillo-Quirante, Ph.D.  
Research Consultant  
Appreciating Science: A Project on the  
Inclination and Decision of Filipino K11 to K12 Students in the Philippines to Pursue Science in  
College/University and as a Career Path (Year 3)"

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This communication may contain confidential or privileged information, and is intended solely for the individual or entity to whom it is originally addressed. Any disclosure, copying, dissemination, or any action taken in reliance to it by others other than the intended recipient, is strictly prohibited. The opinions, conclusions, and statements expressed in this message are those of the sender and may not necessarily reflect the views of the Department of Education.



**Memorandum from the  
Office of the Undersecretary  
Atty. Revsee A. Escobedo  
March 8, 2022**



Republic of the Philippines  
**Department of Education**  
OFFICE OF THE UNDERSECRETARY

**MEMORANDUM**

TO : **REGIONAL DIRECTORS**  
Regions I, III, V, VI, VII, VIII, IX, XI, XII, and NCR

FROM : *Revsee A. Escobedo*  
**ATTY. REVSEE A. ESCOBEDO**  
Undersecretary  
Field Operations, Palarang Pambansa Secretariat, and DEACO

SUBJECT : **REQUEST OF THE UP COLLEGE OF MASS COMMUNICATION FOUNDATION, INC. FOR ENDORSEMENT OF THE RESEARCH STUDY TITLED "A PROJECT ON THE INCLINATION AND DECISION OF FILIPINO K11 TO K12 STUDENTS IN THE PHILIPPINES TO PURSUE SCIENCE IN COLLEGE/UNIVERSITY AND AS A CAREER PATH (YEAR 3)"**

DATE : March 8, 2022

This Office respectfully endorses the attached letter addressed to Secretary Leonor Magtolis Briones from Dr. Arminda V. Santiago, Project Leader and President of UP College of Mass Communication Foundation, Inc. (UP CMCFI), dated February 16, 2022, which was received by this Office on March 8, 2022, regarding their request for the participation of teachers and students in survey interviews, focus group discussions, and key informant interviews. Further, these shall be done online or remotely, for the continuation of their project, which is currently on its third and last year.

The research study titled "A Project on the Inclination and Decision of Filipino K11 to K12 Students in the Philippines to Pursue Science in College/University and as a Career Path (Year 3)", still in partnership with the Department of Science and Technology – Science Education Institute (DOST-SEI), aims to answer what factors and in what contexts will Grade 11 to 12 students be inclined and decide to pursue a Science or Science-related track in College/University and as a career path.

For queries and concerns, kindly contact Ms. Katrina Ramos at (+632) 8981-8500 local 2678 or at [up.cmcfi@gmail.com](mailto:up.cmcfi@gmail.com).

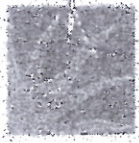
For your reference and appropriate action.

HD/12-0026/03082022

Office of the Undersecretary for Field Operations, Palarang Pambansa Secretariat, and DEACO  
Department of Education, Central Office, Merced Avenue, Pasig City (Room 515, Mabini Building)  
Tel. No: (02) 631 84 92 Fax No: (02) 633 53 13  
Email: [usec.regops@deped.gov.ph](mailto:usec.regops@deped.gov.ph)



**UPMCFI letter request for  
Endorsement with Concept Paper of  
Year 3 addressed to Dr. Leonor  
Mirasol Magtolis-Briones with  
received stamp and advisories**



UNIVERSITY OF THE PHILIPPINES  
COLLEGE OF MASS COMMUNICATION FOUNDATION, INC.

16 February 2022

**DR. LEONOR MIRASOL MAGTOLIS-BRIONES**  
Secretary, Department of Education  
DepEd Complex, Meralco Ave., Pasig, Metro Manila

**SUBJECT: REQUEST FOR ENDORSEMENT**

Dear Secretary Briones,

Warm Greetings from the U.P. College of Mass Communication Foundation, Inc.! We sincerely hope that this letter finds you well and in good health.

This year is the third and last year of the DOST - Science Education Institute (SEI) project "A Project on the Inclination and Decision of Filipino K11 to K12 Students in the Philippines to Pursue Science in College/University and as a Career Path (Year 3)", which the UP College of Mass Communication Foundation, Inc. is conducting.

The results of the three-year research will be the basis for the development of a communication and media plan to promote science among Filipino students.

We thank you for endorsing this project in the last two (2) years.

May we again request the endorsement of the Department of Education to encourage the participation of teachers and students in survey interviews, focus group discussions, and key informant interviews, all of which will be done online/remotely.

We will also appreciate your endorsement of this project to the regional offices of the Department of Education, specifically, in the research sites, Regions I, III, V, VI, VII, VIII, IX, XI, XII, and NCR. The endorsements will greatly expedite our acquisition of informed consent and parental support for the participation of the schoolchildren and facilitate the conduct of our data gathering activities.

Attached to this request is the Year 2 Executive Summary and the Year 3 concept paper.

Should you have any queries and concerns, you may get in touch with our UPCMCFI Assistant, Ms. Katrina Ramos at telephone number (+632) 8981-8500 local 2678 or email "UP College of Mass Communication Foundation, Inc. (UPCMCFI)" [up\\_cmcfi@email.com](mailto:up_cmcfi@email.com).

Thank you very much and we look forward to your favorable response.

Sincerely yours,

**PROF. ARMINDA V. SANTIAGO, PhD**  
UP CMCFI President/Project Leader

cc: **Atty. NEPOMUCENO A. MALALUAN**  
Undersecretary and Chief of Staff

**ATTY. REYSEE ACUÑA ESCOBEDO** Undersecretary  
Planning, Field Operations, and Human Resources and Organizational Development (Organizational Effectiveness, School Effectiveness, and Human Resource Development)

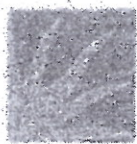
**TOMISITO M.C. UMALI, Esq.** Undersecretary  
Legislative Affairs

DepEd - SDO of Bulacan  
**RECEIVED**  
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DepEd - SDO of Bulacan  
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Time: \_\_\_\_\_

ORDERS SECTION, REGIONAL OFFICE NCR  
**RECEIVED**  
No. 1270  
APR 18 2022

Republic of the Philippines  
Department of Education  
4/5/2022  
Reproduction No. 112, s. 2022  
For dissemination and compliance.  
**ZENIA G. MOSTOLES, EdD, CESO V**  
Schools Division Superintendent

**Advisory**  
No. 049 s. 2022  
To: All Schools Division Superintendents  
For information.  
  
**MAY R. ECLAR, PhD, CESO III**  
Regional Director



UNIVERSITY OF THE PHILIPPINES  
 COLLEGE OF MASS COMMUNICATION FOUNDATION, INC.

A Three-Year Project on the Perception of STEM Among  
 Filipino Grades 3 to 12 Students in the Philippines (2020 to 2022)

Appreciating Science: "A Project on the  
 Inclination and Decision of Filipino K11 to K12 Students in the Philippines to Pursue  
 Science in College/University and as a Career Path (Year 3)

CONCEPT PAPER

PROGRAM TITLE	A Three-Year Project on the Perception of STEM Among Filipino Grades 3 to 12 Students in the Philippines (2020 to 2022)
PROJECT TITLE	Appreciating Science: "A Project on the Inclination and Decision of Filipino K11 to K12 Students in the Philippines to Pursue Science in College/University and as a Career Path (Year 3)
PROJECT LEADERS	Professor Arminda V. Santiago, Ph.D./F and Professor Lourdes M. Portus, Ph.D./F Agency: UP College of Mass Communication Foundation, Inc. Address/Telephone/Fax/Email: Ylanan St., Plaridel Hall, College of Mass Communication, University of the Philippines, Diliman, Quezon City 1101 / 63-2-8981-8500 local 2661 and 2679 / 63-2-926-3465 / armisan2009@gmail.com / avsantiago@up.edu.ph / lmportus@up.edu.ph / up.cmefi@gmail.com
COOPERATING AGENCIES	None
SITES OF IMPLEMENTATION	10 Regions/Nationwide
PROJECT DURATION	March 2022 to February 2023

INTRODUCTION

STEM has become an important and salient component of basic education not only in the Philippines but throughout the world. Having its origin and nascence in the United States in 2001, this education policy, sometimes referred to as a curriculum choice, implicates the development of a knowledge-competitive workforce that can contribute to the economy of a country. STEM is an acronym to mean Science- Technology-Engineering-Mathematics (sometimes shortened as Math), these are the identified fields or disciplines that weigh on the

perceived requirements to become an effective economic contributor. There are times when other disciplines are added into the mix, such as Arts and Medicine.

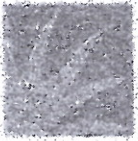
The emphasis on STEM is borne out of the belief that STEM generally serve to catalyze society's growth and development. The STEM track, which is taught using an interdisciplinary and applied approach, "is designed to produce graduates of secondary level who will take science, research, mathematics and engineering related courses in tertiary level and thereby add to the scientific and scholarly workforce of the country (Estonanto 2017).

However, a study published in December 2020 raised the concern about a growing number of STEM students who chose to pursue non-STEM degree programs in college or university as well as "students who entered college with the original aim of pursuing a STEM field career who drop out of school or choose a non-STEM program" (Rafanan, de Guzman, and Rogayan, "Pursuing STEM Careers: Perspectives of Senior High School Students" in Participatory Educational Research (PER), Vol. 7(3), pp. 38-58, December 2020). The study further reports that:

In the Philippines, STEM graduates are insufficient; hence, the country does not have sufficient scientists (Anito, Morales & Palisoc, 2019). The Philippines only has 189 scientists per million which is very low compared to the UNESCO recommendation which is 380 per million (Anito et al., 2019). The low number of scientists in the country is greatly attributed to the low graduates of STEM-related careers. The Commission on Higher Education (CHED) report revealed that the completion rate across STEM areas based on the average 5-year data until 2016-2017 is only 21.10%. In particular, sciences had a completion rate of 25.52% followed by mathematics (21.20%), information technology (19.56%), engineering and technology (18.97%), and medical and allied fields with 14.38%. This scenario is further validated by EduTECH (2016) that the Philippines is experiencing shortages in the workforce in the field of STEM (2020).

In the STEM program which was designed to prepare students who express keen interest in taking college degrees focused on Science, Technology, Engineering, and Mathematics (STEM), senior high school students will be exposed to learning activities that will hone their knowledge and skills in analyzing data, understanding real-world impacts, and conducting research (<https://www.onlineshs.com/stein/>). STEM education attempts to produce K-12 graduates who are "globally competitive" and gainfully employed. The so-called hope of the country is expected to acquire knowledge and skills in problem-solving, analysis of data, and application of evidences to make decisions.

In the 2021 APEC STEM-Plus for Women and Girls Webinar in March, it was reported that:



UNIVERSITY OF THE PHILIPPINES  
COLLEGE OF MASS COMMUNICATION FOUNDATION, INC.

Educational institutions in the Philippines are gradually recognizing the relevance of STEM education in supporting the government's thrust for innovation to drive economic growth. Thus, in a bid to increase the number of graduates who enroll in STEM-related courses at the tertiary level, the Department of Education designed a STEM strand under the K-12 Academic Track of the Senior High School. The STEM strand will provide students with the fundamental concepts related to science, technology, engineering and mathematics. Students study subjects in Biology, Physics, Chemistry, Calculus, Technology, and Research which will prepare them from taking college courses related to Applied and Pure Sciences, Engineering, IT and Mathematics. Moreover, the STEM strand paves the way for broader opportunities for students in basic education to learn and practice science and mathematics, which can prepare them for global education and employment, as well as entrepreneurship (Conrado Rotor, Jr. "STEM: Update: Philippines" in <https://www.apecstemplusw.org/blog/stem-update-philippines>).

It was further added that getting more students to enroll in STEM is still a major challenge. The same report also indicated a gender gap in STEM enrollment – there was a need to encourage more women/girls to pursue STEM in senior high school and pursue STEM courses in college. This was due to the reality-the-ground that STEM courses are male-dominated (Rotor, Jr. 2021).

Thus it is salient to explore and find out the perspectives, inclinations, and decision of Filipino K11 to K12 students to pursue Science as an academic pursuit in college/university and as a career path.

### BACKGROUND AND RATIONALE

#### Learnings from Year 1

The Year 1 generated important data as well as salient insights on how selected K3 to K6 basic education students perceived Science and looked at their levels of appreciation and the relevance of Science in their academic pursuits that could influence them to pursue a Science career or Science-related endeavors.

It covered the period January 2020 to February 2021. K3 to K6 students were specifically selected for the study because of the need to examine their formative years of Science education, which commonly starts on their third year of elementary education in the Philippines. Additionally, it further investigated the following aspects:

1. The students' perception, attitude, awareness, and knowledge in Science;

2. The student's experiences in learning Science; and
3. The student's inclination to pursue Science.

Overall, Year 1 reveals that K3-K6 students have neutral to positive perceptions about and attitudes on Science. They also exhibited neutral to positive scores on their awareness and knowledge of Science. This illustrates that Filipino K3-K6 students expressed neutral to positive sentiments to the statements measuring their (1) Perception about Science, (2) Attitude on Science, (3) Awareness of Opportunities in Science, (4) Knowledge about Science, (5) Perceived Competency of Science Teachers, (6) Parental Support in Learning Science, and (7) Inclination Towards Scientific Opportunities. There were no statements that the students found negative.

However, the FGDs reveal that generally, K3-K6 students have a shallow understanding of science. This is quite understandable since they are just beginning their journey in the realm of Science. Most of them recalled terms that were taught inside the classroom but did not know how to characterize, explain, and even relate these with one another. Results indicate students' difficulty in absorbing science concepts and thinking about them in creative and innovative ways. The negative notions about science as a difficult subject are not new issues anymore, but it is important to note how such negativities can be dispelled by effective teaching. In other words, the skill of the teacher can make all the difference. While science is perceived to be a difficult subject, a good teacher can make it enjoyable for students, and amplify student interest.

Year 1 posed great challenges to the research team. When the research was conceived as early as late 2019, it was envisioned that all methodological procedures of the research would be implemented on an in-person face-to-face manner. Year 1 was greatly affected by the pandemic that has put to a brief standstill the main participants of the project – the schoolchildren and the schools. A reassessment of strategies had to be made because the project team had to shift to using online platforms in administering the interviewer-administered survey; conducting the FGDs with participating schoolchildren and the conduct of the Key Informant Interviews through online platforms using Google Meet, Zoom, and in some cases through phone calls, instead of the proposed face-to-face survey. However, these were challenges that were surmounted by the research team despite some delays and problems in getting all participants for the study.

#### **Learnings from Year 2**



UNIVERSITY OF THE PHILIPPINES  
COLLEGE OF MASS COMMUNICATION FOUNDATION, INC.

For Year 2, the focus was on K7 to K10 students. These are students who are in the age bracket of 11 years old to 17 years old. These are recognized as the teenage years. And the youth in this age range are now at the threshold of discovery. In school, they are engaged in a multitude of educational activities that provides them with opportunities to explore their aptitudes and skills in leadership.

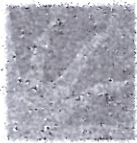
The Year 2 study unveiled an assortment of factors and contexts on why K7 to K10 students would pursue a STEM or science-related track in their studies. Generally, these can be categorized as:

- a) teachers and their teaching styles and attitude,
- b) educational environment, such classroom conditions, facilities, and activities,
- c) the students' own interests and dreams, and
- d) involvement of other stakeholders, such as the parents, family members, LGUs, and funders.

On the study's objective of determining the interest and inclination of the students to take up science courses, it was found out that they tend to look into their future and would take STEM to ensure or achieve their dreams. Students who have good learning environment and have access to financial support are more inclined to take STEM courses.

On the objective of exploring the push and pull factors that will encourage students to pursue or not pursue STEM tracks, the researchers observed that pull factors can become push factors and vice versa. For instance, they dream of being doctors, engineers, and architects, but also want careers outside science such as law, accounting, teaching, and culinary professions and those that pay well. Moreover, while they find science a difficult subject, the majority finds it interesting. The presence of a good teacher is necessary, but a poor one would make them lose interest in Science.

A factor that was explored by the study included the situation of students amidst the COVID-19 pandemic and how they cope with the remote learning setup. During the pandemic, there are expectations for teachers to be more understanding and accommodating given that not all students have neither gadgets nor internet connections. While there are modules that students with no Internet could work on, the quantity and quality of learning modules are wanting. The parents who are expected to assist them in their modules, were either not qualified or do not have the time to support their children in understanding the



UNIVERSITY OF THE PHILIPPINES  
COLLEGE OF MASS COMMUNICATION FOUNDATION, INC.

What factors and in what contexts will K11 to 12 students be inclined and decide to pursue a Science or Science-related track in College/University and as a career path?

Specifically, the objectives of this Year 3 project are as follows:

1. To determine the inclination and decision of the students to take up science or science-related degree programs in college/university or as a career path;
2. To identify the factors and the reasons that will make the students choose science or science-related degree programs in college/university or as a career path;
3. To describe the decision-making process of the students in selecting their science or science-related degree program in college/university or as a career path; and
4. To find out the role of teachers, parents, peers, other stakeholders and other influencers or conditions in facilitating or hindering the choice of junior and senior students in pursuing a science or science-related degree program in college/university or as a career path.

#### Methodology

The above objectives will be achieved through a triangulated Research Design that will fuse together the results of quantitative and qualitative methods. Particularly, the project will employ online survey, Focus Group Discussion and Key Informants Interview; additionally, it will use records or documents review to enrich further the results of the study.

The coverage of the study will be nationwide with samples to be drawn from the regions that exhibited the lowest level of aptitude in science based on the PISA study. Survey respondents will total 1,200 from public and private schools, distributed in 10 regions.

To determine the students' perception, inclination and decision to pursue Science or Science-related degree programs in college/university, a total of eight (8) focus group discussions among K11 to K12 students will be facilitated from four (4) regions. Each group will comprise 6 to 10 students who will share their insights on topics like their favorite subjects and science topics, perception and interests, their chosen degree programs, their future career plan, health condition, STEM track, their science teachers, and other influencers and the remote learning setup during the COVID pandemic.

Sixteen (16) key informant interviews will be conducted from four (4) selected regions. Principals and science teachers or coordinators and other stakeholders will be interviewed online in accordance with the KII guide formulated by the team.

The major concepts and indicators that will be explored in the FGD and KII are divided into the following sections:

- a) Profile of the School and students;
- b) Inclination, decision and choice of Degree program;
- c) Decision-making factors and process; and
- d) Facilities and Teaching Materials, influencers, environment and other conditions

Survey questionnaires, FGD and KII Guides will be formulated to capture the variables and concepts under study. These will be pre-tested and will be used in data collection.

Pre-tested instruments such as survey questionnaires, FGD and KII Guides will be used in data collection. Questionnaires and Guide questions will be drawn to capture the variables and concepts under study. Survey responses will be encoded and analyses will be based on frequencies, cross tabulations, tests of association of selected variables, and regression. FGDs and KIIs will be recorded with permission of the participants and informants. These will be transcribed verbatim and the transcriptions will be organized into themes for the write-up.

#### References:

Estonanto, Aldrin John Jao, "Acceptability and Difficulty of the STEM Track Implementation in Senior High School" in *Asia Pacific Journal of Multidisciplinary Research*, Vol. 5 No.2, 43-50 May 2017.

Rafanan, de Guzman, and Rogayan, "Pursuing STEM Careers: Perspectives of Senior High School Students" in *Participatory Educational Research (PER)*, Vol. 7(3), pp. 38-58, December 2020.

Conrado C. Rotor Jr., "STEM+ Update: Philippines" in *APEC-STEM Plus Education for Women and Girls Webinar*, Asia Pacific Economic Cooperation (APEC) March 2021.

<https://www.onlineshs.com/stem/>

<https://www.apecstemplusw.org/blog/stem-update-philippines>



**Email confirmation from Mr. Rovin Canja, Office of the Secretary and Usec Tonisito M.C. Umali, Office of the Legislative Liaison Office**

8/19/22, 4:17 PM

Gmail - [DOST-STEM PROJECT YR 3] REQUEST FOR DEPED ENDORSEMENT



College of Mass Communication Foundation (CMCFI) <up.cmcfi@gmail.com>

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## [DOST-STEM PROJECT YR 3] REQUEST FOR DEPED ENDORSEMENT

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Office of the Secretary <osec@deped.gov.ph>

Wed, Mar 16, 2022 at 3:23 PM

To: "College of Mass Communication Foundation (CMCFI)" <up.cmcfi@gmail.com>

Good day!

This is to acknowledge receipt of your email. Please be advised that we have referred your communication to the Office of the Undersecretary for Field Operations, and Public Affairs Service for appropriate action. For follow-ups, you may email [usec.regops@deped.gov.ph](mailto:usec.regops@deped.gov.ph) and [pas.od@deped.gov.ph](mailto:pas.od@deped.gov.ph).

Thank you.

Respectfully,  
Rovin Canja

### Office of the Secretary

*Department of Education*

*DepEd Complex, Meralco Avenue, Pasig City*

*Tel. No.: (+632) 687-4177, 633-7208, 687-2922*

*Fax No.: (+632) 637-6209*

*[www.deped.gov.ph](http://www.deped.gov.ph)*

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8/19/22, 4:17 PM

Gmail - [DOST-STEM PROJECT YR 3] REQUEST FOR DEPED ENDORSEMENT



College of Mass Communication Foundation (CMCFI) <up.cmcfi@gmail.com>

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## [DOST-STEM PROJECT YR 3] REQUEST FOR DEPED ENDORSEMENT

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TONISITO MACHIAVELLI UMALI <tonisito.umali+canned.response@deped.gov.ph>  
To: up.cmcfi@gmail.com

Wed, Mar 16, 2022 at 12:32 PM

Dear Sir/Madam:

This acknowledges receipt of your email/message.

Please be assured that the proper staff will work on any issue or concern that you may have raised in this message and will respond to you immediately as soon as the same is processed by our staff and/or by the proper office which may have jurisdiction over the subject matter of this message.

Thank you very much.

Sincerely,  
from the Office of  
**TONISITO M.C. UMALI, ESQ.**  
Undersecretary for Legislative Liaison Office,  
External Partnerships Service and Project Management Service  
Department of Education

---

*This communication may contain confidential or privileged information, and is intended solely for the individual or entity to whom it is originally addressed. Any disclosure, copying, dissemination, or any action taken in reliance to it by others, other than the intended recipient, is strictly prohibited. The opinions, conclusions, and statements expressed in this message are those of the sender and may not necessarily reflect the views of the Department of Education.*



**Memorandum from the  
Office of the Undersecretary  
Atty. Revsee A. Escobedo  
July 13, 2021**



Republic of the Philippines  
**Department of Education**  
OFFICE OF THE UNDERSECRETARY

**MEMORANDUM**

TO : **REGIONAL DIRECTORS**  
Regions I, III, V, VI, VII, VIII, IX, XI, XII, and NCR

FROM : *[Signature]*  
**ATTY. REVSEE A. ESCOBEDO**  
*Undersecretary*  
Field Operations, Palarong Pambansa Secretariat, and DEACO

SUBJECT : **REQUEST OF THE UP COLLEGE OF MASS COMMUNICATION FOUNDATION, INC. (UP CMCFI) FOR ENDORSEMENT OF THE RESEARCH STUDY TITLED "APPRECIATING SCIENCE: A PROJECT ON PERCEPTION AND INCLINATION OF FILIPINO K7 TO 10 STUDENTS IN THE PHILIPPINES TO PURSUE SCIENCE TRACKS"**

DATE : July 13, 2021

This Office respectfully endorses the attached letter addressed to Secretary Leonor Magtolis Briones, from Dr. Anninda V. Santiago, Project Leader/President, UP College of Mass Communication Foundation, Inc. (UP CMCFI), dated June 14, 2021, which was received by this Office on July 9, 2021, relative to their request for the participation of teachers and students in survey interviews, focus group discussions, and key informant interviews, all of which will be done online/remotely for the continuation of their project which is currently on its second year. Still in partnership with the Department of Science and Technology - Science Education Institute (DOST-SEI), the research study titled "Appreciating Science: A Project on Perception and Inclination of Filipino K7 to 10 Students in the Philippines to Pursue Science Tracks" aims to look into the factors that influence students in pursuing STEM or STEM-related learning tracks.

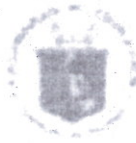
For further queries and concerns, kindly contact Ms. Rissa Silvestre, Executive Director, UP CMCFI, and/or Ms. Katrina Ramos at (+632) 8929-2671, +(632) 8981-8500 local 2678 or at [upcmcfi@gmail.com](mailto:upcmcfi@gmail.com).

For your reference and appropriate action.

2021-07-13 10:57:20 AM  
Office of the Undersecretary for Field Operations, Palarong Pambansa Secretariat, and DEACO  
Department of Education, Central Office, Maricao Avenue, Pasig City (Room 515 Mabin Building)  
Tel. No. (02) 631 84 92 Fax No. (02) 633 53 13  
Email: [upcmcfi@gmail.com](mailto:upcmcfi@gmail.com)



**Memorandum from the  
Office of the Undersecretary  
Atty. Revsee A. Escobedo  
August 22, 2020**



Republic of the Philippines  
**Department of Education**  
 OFFICE OF THE UNDERSECRETARY

0827 2020

**MEMORANDUM**

**TO: ALL DEPED REGIONAL DIRECTORS**

DEPARTMENT OF EDUCATION  
 SEP 02 2020  
 018-0920

**FROM: ATTY. REYSEE A. ESCOBEDO**  
 Undersecretary  
 Field Operations, Policy and Planning Secretariat and  
 DEACOs

**SUBJECT: REQUEST FOR ENDORSEMENT FOR THE RESEARCH STUDY ENTITLED "APPRECIATING SCIENCE: PERCEPTION OF SCIENCE AMONG FILIPINO K3 TO K6 STUDENTS IN THE PHILIPPINES" OF THE UNIVERSITY OF THE PHILIPPINES COLLEGE OF MASS COMMUNICATION FOUNDATION, INC**

**DATE: August 27, 2020**

This Office respectfully endorses the attached letter of Ms. Arminda V. Santiago, Ph.D., Project Leader/President, UP College of Mass Communications Foundation, Inc (UPCMCFI), relative to their request for the participation of teachers and students in survey interviews, focus group discussions, and key informant interviews for the conduct of their three year research study in partnership with the Department of Science and Technology - Science Education Institute (DOST-SEI). The research study, entitled "Appreciating Science: Perception of Science Among Filipino K3 to K6 Students in the Philippines" aims to look into the perception and relevance of Science among grade school students.

For further queries and concerns, kindly contact Ms. Russa Silvestre, Executive Director, UPCMCFI, and/or Ms. Katrina Ramon at (632) 8929-2671, (632) 8981-8500 local 2678 or at [info@upcmcfi.org](mailto:info@upcmcfi.org)

For your consideration and appropriate action.

Office of the Undersecretary for Field Operations, Planning, Personnel Secretariat and DEACOs

August 27, 2020

**To: Schools Division Superintendents  
 Public School Heads  
 All Others Concerned**

For information, dissemination and appropriate action.

**ESTELA L. CARINO, EdD., CESO IV**  
 Director IV/Regional Director

OFFICE OF THE UNDERSECRETARY  
 FIELD OPERATIONS, POLICY AND PLANNING SECRETARIAT AND DEACOs  
 DATE: 9.2.2020  
 BY: [Signature]  
 RECEIVED SECTION



**Indorsement from Regional Director  
IV – Mr. Allan G. Farnazo, March 10,  
2022**



Republic of the Philippines  
**Department of Education**  
DAVAO REGION

Office of the Regional Director

1<sup>st</sup> Indorsement  
March 10, 2022

Respectfully referred to all **SCHOOLS DIVISION SUPERINTENDENTS OF REGION XI**, inviting your attention to the attached invitation of the University of the Philippines College of Mass Communication Foundation, Inc. (UPCMCFI) through **PR ARMINDA V. SANTIAGO, PhD**, U.P. CMCFI President/Project Leader, contents of which are clarified by Prof Santiago herself, dated February 16, 2022.

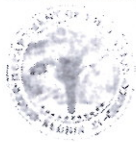
This Office directs that favorable action be taken on the request of Prof. Santiago to explore the possibilities of coordinating with your office in the next few days up such request intended for the DOST-SEI- supported study. Hence, the participation of teachers and students of the said research project should only be made in coordination with the concerned school head and teachers shall be in no way shall not be disrupted.

*Handwritten initials*

Re: Letter of Prof. /  
U.P. CMCFI Pres  
UP, college of M  
Philippines

Enclosed: As Stated

U.P. CMCFI/28



Address: F. Torres St., Davao City  
Telephone Nos.: (082) 291-1111



UNIVERSITY OF THE PHILIPPINES  
COLLEGE OF MASS COMMUNICATION FOUNDATION, INC.

16 February 2022

REGIONAL DIRECTOR ALLAN G. FARNAZO  
REGIONAL DIRECTOR, Department of Education REGION 11  
F. Torres St., Davao City  
Email: [region11@deped.gov.ph](mailto:region11@deped.gov.ph)  
(082) 227-93-42; 227-11-02; 291-16-65 221-61-47; 221-84-59\*; [region11@deped.gov.ph](mailto:region11@deped.gov.ph)

09 FEB 2022

P 7:57

**SUBJECT: REQUEST FOR ENDORSEMENT**

Dear Director Farnazo:

Warm greetings from the U.P. College of Mass Communication Foundation, Inc. (UPCMCFI)!

We are again requesting your kind endorsement for our DOST-SEI-supported study entitled "*Appreciating Science: A Project on the Inclination and Decision of Filipino K11 to K12 Students in the Philippines to Pursue Science in College/University and as a Career Path (Year 3)*" in Region 11.

The project is a three-year project and it is now in its final year. For years 1 and 2, the Department of Education released its advisory, endorsing the request of our Project Leader, Dr. Arminda V. Santiago (please see attached Annex B).

Just like Years 1 and 2, we hope to get the Department of Education's formal endorsement soon, which we are just waiting for release based on our attached request letter (please see Annex A).

At the regional level, we trust that you will likewise endorse the said project for its smooth implementation. Your endorsement will encourage the participation of teachers and students in survey interviews, focus group discussions, and key informant interviews, all of which will be done online/remotely.

In Region 11, we will identify one (1) private high school and one (1) public high school to be part of our research sites.

We will conduct remote/online interviews and/or focus group discussions with the school's principals, science coordinators, and selected K11 to K12 students, following required research ethics and health protocols.

We have included in this request the Executive Summary of the Year 2 Study and the Concept Paper for Year 3. We will coordinate with your office in the next few days to follow up on this request.

We look forward to your support for our study, which seeks to generate relevant knowledge that can be used to further advance science education in the country.

Should you have any queries and concerns, you may get in touch with our UPCMCFI Assistant, Ms. Katrina Ramos at telephone number (+632) 8981-8500 local 2678 or email "UP College of Mass Communication Foundation, Inc. (UPCMCFI)" [up.cmcfi@gmail.com](mailto:up.cmcfi@gmail.com).

Thank you very much. Best regards.

Very truly yours,



**PROF. ARMINDA V. SANTIAGO, PhD**  
U.P. CMCFI President / Project Leader

Cc: Asst. Regional Director DR. MARIA INES C. ASUNCION



Republic of the Philippines  
**Department of Education**  
DAVAO REGION

Office of the Regional Director

1<sup>st</sup> Indorsement  
March 10, 2022

Respectfully referred to all **SCHOOLS DIVISION SUPERINTENDENTS OF REGION XI**, inviting your attention to the attached invitation of the University of the Philippines College of Mass Communication Foundation, Inc. (UPCMCFI)) through **PROF. ARMINDA V. SANTIAGO, PhD**, U.P. CMCFI President/Project Leader, contents of which are clarified by Prof Santiago herself, dated February 16,2022.

This Office directs that favorable action be taken on the request of Prof. Santiago for her to explore the possibilities of coordinating with your office in the next few days to follow up such request intended for the DOST-SEI- supported study. Hence, participation of the teachers and students of the said research project should only be voluntary and prior arrangement with the concerned school head and teachers shall be made ensuring that classes shall not be disrupted.

  
**ALLAN G. FARNAZO**  
Director IV

Re: Letter of Prof. **ARMINDA V. SANTIAGO, PhD**  
U.P. CMCFI President/Project Leader  
UP, college of Mass Communication Foundation,  
Philippines

Enclosed: As Stated.

*RJP-Emchd28*



Address: F. Torres St., Davao City (8000)  
Telephone Nos.: (082) 291-1665; (082) 221-6147





UNIVERSITY OF THE PHILIPPINES  
COLLEGE OF MASS COMMUNICATION FOUNDATION, INC.

16 February 2022

REGIONAL DIRECTOR ALLAN G. FARNAZO  
REGIONAL DIRECTOR, Department of Education REGION 11  
F. Torres St., Davao City  
Email: [region11@deped.gov.ph](mailto:region11@deped.gov.ph)  
(082) 227-93-42; 227-11-02; 291-16-65 221-61-47; 221-84-59\*; [region11@deped.gov.ph](mailto:region11@deped.gov.ph)

09 MAR 2022  
P 2:57

**SUBJECT: REQUEST FOR ENDORSEMENT**

Dear Director Farnazo:

Warm greetings from the U.P. College of Mass Communication Foundation, Inc. (UPCMCFI)!

We are again requesting your kind endorsement for our DOST-SEI-supported study entitled "*Appreciating Science: A Project on the Inclination and Decision of Filipino K11 to K12 Students in the Philippines to Pursue Science in College/University and as a Career Path (Year 3)*" in Region 11.

The project is a three-year project and it is now in its final year. For years 1 and 2, the Department of Education released its advisory, endorsing the request of our Project Leader, Dr. Arminda V. Santiago (please see attached Annex B).

Just like Years 1 and 2, we hope to get the Department of Education's formal endorsement soon, which we are just waiting for release based on our attached request letter (please see Annex A).

At the regional level, we trust that you will likewise endorse the said project for its smooth implementation. Your endorsement will encourage the participation of teachers and students in survey interviews, focus group discussions, and key informant interviews, all of which will be done online/remotely.

In Region 11, we will identify one (1) private high school and one (1) public high school to be part of our research sites.

We will conduct remote/online interviews and/or focus group discussions with the school's principals, science coordinators, and selected K11 to K12 students, following required research ethics and health protocols.

We have included in this request the Executive Summary of the Year 2 Study and the Concept Paper for Year 3. We will coordinate with your office in the next few days to follow up on this request.

We look forward to your support for our study, which seeks to generate relevant knowledge that can be used to further advance science education in the country.

Should you have any queries and concerns, you may get in touch with our UPCMCFI Assistant, Ms. Katrina Ramos at telephone number (+632) 8981-8500 local 2678 or email "UP College of Mass Communication Foundation, Inc. (UPCMCFI)" [up.cmcfi@gmail.com](mailto:up.cmcfi@gmail.com).

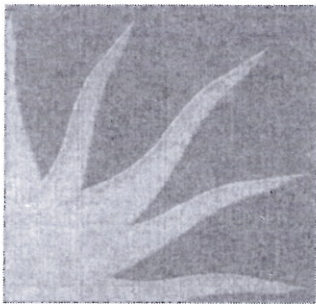
Thank you very much. Best regards.

Very truly yours,



**PROF. ARMINDA V. SANTIAGO, PhD**  
U.P. CMCFI President / Project Leader

Cc: Asst. Regional Director DR. MARIA INES C. ASUNCION



**Indorsement from the  
Schools Division**

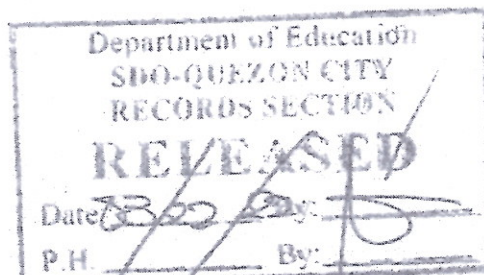
- 1. Mr. Brian E. Ilan**
- 2. Ms. Nerissa L. Losaria**
- 3. Mr. Wilfredo E. Cabral**
- 4. Mr. Malcolm S. Garma**



Republic of the Philippines  
**Department of Education**  
NATIONAL CAPITAL REGION  
SCHOOLS DIVISION OFFICE OF QUEZON CITY

March 16, 2022

**DR. ARMINDA V. SANTIAGO**  
Graduate Student/Researcher  
University of the Philippines, Diliman



Dr. Santiago:

This is in reference to your communication dated March 11, 2022, re: conduct of study entitled **"Appreciating Science: A Project on the Inclination and Decision of Filipino K11 to K12 Students in the Philippines to Pursue Science in College/University and as a Career Path (Year 3) in the National Capital Region"**, in selected schools in this Division, interposing no objection to the said request provided that:

1. safety and health protocols must be strictly followed;
2. remote and online means of conducting the study shall be implemented;
3. necessary arrangements shall be made with the school principal and personnel concerned;
4. the conduct of the study shall not interfere with the regular program of the school;
5. no disruption of classes. No interview should be done during class hours;
6. participation of any student/school personnel is voluntary;
7. derogatory/ demeaning/ offensive terms in the research tools are not allowed;
8. result of the study should not be used for other purposes other than stated in the letter and allowed by this Office;
9. taking of photographs shall only be allowed with permission from the school principal and the subject/person concerned; and
10. anonymity of the respondents shall be preserved.

Attention is invited to the provision of DepEd Order No. 9, s. 2005 entitled: "Instituting Measures to Increase Engaged Time-on-Task and Ensuring Compliance Therewith".

  
**BRIAN E. ILAN, Ed.D.**  
Officer-In-Charge

Office of the Assistant Schools Division Superintendent  
Chair, Schools Division Research Committee

SGDD/PAR/IAN/ARLENE  
DOCUMENT TRACKING NO. 969



Nueva Ecija St. Bago Bantay Quezon City  
[sdo.quezoncity@deped.gov.ph](mailto:sdo.quezoncity@deped.gov.ph)

(8)853-69-00  
[www.depedqc.ph](http://www.depedqc.ph)



Republic of the Philippines  
**Department of Education**  
NATIONAL CAPITAL REGION  
SCHOOLS DIVISION OFFICE OF QUEZON CITY

March 16, 2022

TO : PUBLIC SENIOR HIGH SCHOOL PRINCIPALS/OFFICERS-IN-CHARGE

Sirs/Mesdames:

Attached is the letter of **Dr. Arminda V. Santiago**, graduate student/researcher, University of the Philippines, Diliman, dated March 11, 2022, requesting permission to conduct research on **"Appreciating Science: A Project on the Inclination and Decision of Filipino K11 to K12 Students in the Philippines to Pursue Science in College/University and as a Career Path (Year 3) in the National Capital Region"**, contents of which are self-explanatory.

Dr. Santiago be allowed to conduct her research study subject to the conditions stated in the letter of this Office, copy attached for reference.

  
**BRIAN E. ILAN, Ed.D.**  
Officer-In-Charge

Office of the Assistant Schools Division Superintendent  
Chair, Schools Division Research Committee

SGOD/PAR/IAN/ARLENE  
DOCUMENT TRACKING NO. 969



Nueva Ecija St. Bago Bantay Quezon City (8)853-69-00  
sdo.quezoncity@deped.gov.ph www.depedqc.ph



Republic of the Philippines  
**Department of Education**  
NATIONAL CAPITAL REGION

DNCR-F-PPR-007/RO/011120192019

August 25, 2020

**TO: Schools Division Superintendents**

Dear Sirs/Mesdames:


Attached are the Memorandum of Atty. Revsee A. Escobedo, Undersecretary for Field Operations, Polarang Pambansa Secretariat, and DEACO of DepED Central Office relative to the request of Ms. Arminda V. Santiago, PhD., Project Leader/President, UP College of Mass Communications Foundation, Inc. (UPCMCFI), requesting for the conduct of three-year research study, in partnership with the Department of Science and Technology – Science Education Institute (DOST-SEI), their study entitled, **"APPRECIATING SCIENCE: PERCEPTION OF SCIENCE AMONG FILIPINO K3 to K6 STUDENTS IN THE PHILIPPINES."**

The study aims to look into the perception and relevance of Science among grade school students.

Participation of teachers and students are needed in survey interviews, focus group discussions, and key informant interviews as they are ready to switch from face to face to online platforms. They may be allowed to disseminate online the research instrument in the public schools subject to the conditions stated in the letter to the researchers of this Office, copy is attached for reference.

For further queries and concerns, please contact Ms. Rissa Silvestre, Executive Director, UPCMCFI, and/or Ms. Katrina Ramos, UPCMCFI Assistant, at (+632) 8929-2672, (+632) 8981-8500 local 2678 or at [upcmcfi@gmail.com](mailto:upcmcfi@gmail.com).

Very truly yours,

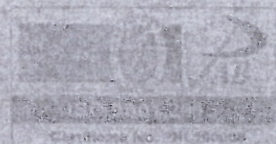
  
**MALCOLM S. GARMA**  
Director IV

Regional letter no. 72, s. 2020

Encl.:  
As stated

*A legacy as rich as excellence!*

Marina St., Bata Bantay, Quezon City  
Tel. Nos. (20) (02) 724-2333 loc. (01)  
Email Address: [deped@doe.gov.ph](mailto:deped@doe.gov.ph)  
Website: <http://www.deped.gov.ph/region/ncc/>





Republic of the Philippines  
**Department of Education**  
NATIONAL CAPITAL REGION

DNCR-F-PPR-007/R0/011120192019

August 25, 2020

**Ms. ARMINDA V. SANTIAGO**  
President  
UP-College of Mass Communication  
Foundation Inc.  
Pandal Hall, Ylanan St., Diliman, Q.C.


Attention: **MS. RISSA SILVESTRE**  
Executive Director

Dear Mesdames:

In reference to your request letter RE: CONDUCT OF RESEARCH entitled "**APPRECIATING SCIENCE: PERCEPTION OF SCIENCE AMONG FILIPINO K3 to K6 STUDENTS IN THE PHILIPPINES**", such was referred to the Schools Divisions Superintendents, this Region, however you are advised to observe/comply with the following:

1. Schedule of classes should be strictly followed. Interviews should be undertaken outside class hours.
2. Priority is given to school activities and functions of school personnel to their duties and responsibilities.
3. Participation of any student/school personnel to the study is voluntary.
4. The Region and the Division concerned shall be furnished a copy of the final and signed paper, both in print and in soft copy.
5. The results should be used only for the purpose.

Very truly yours,

  
**MALCOLM S. GARMA**  
Director IV

Enclo. as stated  
Dard



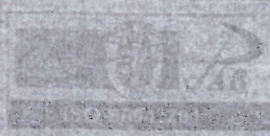
*A legacy of vision and excellence*

Misamis St., Brgy. Barlay, Quezon City

Tel. Nos. 720-5824, 726-2012 to 801

Telex Address: NCRDEPED.GOV.PH

Website: <http://www.deped.gov.ph/region/ncr/>



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8/19/22, 4:16 PM

Gmail - Approved Request for Conduct Study



College of Mass Communication Foundation (CMCFI) <up.cmcfi@gmail.com>

---

## Approved Request for Conduct Study

---

Schools Division Office Quezon City <sdo.quezoncity@deped.gov.ph>  
To: upcmcfi@gmail.com

Tue, Mar 22, 2022 at 9:56 AM

Sir/Mam,

Good day.

Please see attached file for reference. Kindly acknowledge receipt of this email.

Thanks. Keep safe and healthy!

Best,

--  
Department of Education  
Schools Division Office - Quezon City  
Records Section

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This communication may contain confidential or privileged information, and is intended solely for the individual or entity to whom it is originally addressed. Any disclosure, copying, dissemination, or any action taken in reliance to it by others, other than the intended recipient, is strictly prohibited. The opinions, conclusions, and statements expressed in this message are those of the sender and may not necessarily reflect the views of the Department of Education.

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 A\_SANTIAGO.pdf  
1262K

8/19/22, 4:15 PM

Gmail - Letter to Ms. Arminda V. Santiago



College of Mass Communication Foundation (CMCFI) <up.cmcfi@gmail.com>

---

## Letter to Ms. Arminda V. Santiago

---

sdo caloocan records <sdocal\_records@deped.gov.ph>  
To: "UP.CMCFI@gmail.com" <UP.CMCFI@gmail.com>  
Cc: sds.sdocal@deped.gov.ph, sgod.sdocal@deped.gov.ph

Tue, Mar 22, 2022 at 11:45 AM

Good day!

Please see attached file, for your information and guidance.

Trust you find this in order and kindly acknowledge receipt of this email.

--  
Please help us improve our service by giving your feedback through our Customer/Client Satisfaction Survey  
link <https://depedcaloocan.com/client-satisfaction-survey/>

Thank you.

Very truly yours,


**Records Section**  
SDO Caloocan

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 **Letter to Ms. Arminda V. Santiago.pdf**  
877K

8/19/22, 4:16 PM

Gmail - Request for Indorsement



College of Mass Communication Foundation (CMCFI) <up.cmcfi@gmail.com>

---

## Request for Indorsement

---

Planning RO XI <pprd.region11@deped.gov.ph>  
To: up.cmcfi@gmail.com

Wed, Mar 16, 2022 at 9:30 AM

Good day!  
Providing you a copy of the endorsement addressed to all the Schools Division Superintendent of Region XI.  
Kindly acknowledge receipt.

Thank you and keep safe!

--

**Policy, Planning and Research Division**


**Department of Education XI**

**(082) 224-0750**

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*This communication may contain confidential or privileged information, and is intended solely for the individual or entity to whom it is originally addressed. Any disclosure, copying, dissemination, or any action taken in reliance to it by others, other than the intended recipient, is strictly prohibited. The opinions, conclusions, and statements expressed in this message are those of the sender and may not necessarily reflect the views of the Department of Education.*

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 **Indorsement - Invitation from UPCMCFI.pdf**  
885K



Republic of the Philippines  
Department of Education  
NATIONAL CAPITAL REGION  
SCHOOLS DIVISION OFFICE OF CALOOCAN CITY

Office of the Schools Division  
Superintendent

March 17, 2022

**Ms. Arminda V. Santiago**  
President  
UP-College of Mass Communication  
University of the Philippines  
Diliman, Quezon City

Dear Ms. Santiago:

This is to acknowledge receipt of your communication on March 15, 2022, regarding your request to administer research activities relative to your study entitled **Appreciating Science: A project on the Inclination and Decision of Filipino K11 to K 12 Students in the Philippines to Pursue Science in College/University and as a Career Path (Year 3) in the National Capital Region.**

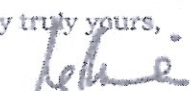
We are pleased to inform you that this Office interposes no objection to your request provided that you comply with the following conditions:

1. Researcher shall adhere to the provisions stipulated in the Regional Letter;
2. Necessary arrangements shall be made with the school principal/s concerned;
3. Researcher must present to the local school authorities and bear a copy of this endorsement prior to any engagement with the school;
4. The conduct of study will not interfere with the regular program of the school;
5. No teacher nor student will be pulled out of his/her classes;
6. Respondents shall be treated with respect and be addressed in a kind manner in accordance with the ethical standards set by DepEd Order No. 16, series of 2017 re: Research Management Guidelines;
7. No government fund or school/office material will be used for the purpose of the study;
8. Data gathered shall be treated with utmost confidentiality and should be used solely for research purposes; and
9. A copy of the findings of the study shall be furnished this Office for reference.

Further, it is reminded that the Schools Division Office adheres to the Department of Education's strict implementation and compliance to the provisions stipulated in DepEd Order No. 9, s. 2005 entitled: **Instituting Measures to Increase Engaged Time on Task and Ensuring Compliance Therewith** and DepEd Order No. 14, s. 2020 entitled **Guidelines on the Required Health Standards in Basic Education Offices and Schools.**

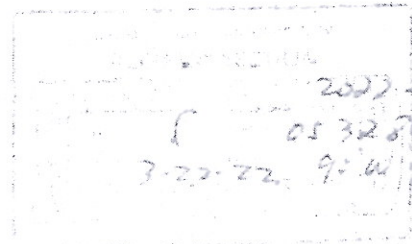
Thank you.

Very truly yours,

  
**NERISSA L. LOSARIA, CESO V**  
Schools Division Superintendent

nrll

2022-03-1659



152 198  
18 MAR 2022



Address: 10<sup>th</sup> Avenue cor. P. Sevilla St., Grace Park, Caloocan City  
Telephone No.: (+63 2) 8-442-0029; 8-361-1463  
Email Address: caloocan.city@deped.gov.ph  
Website: www.depescalocan.com



Republic of the Philippines  
**Department of Education**  
 NATIONAL CAPITAL REGION

REC-002-09-05328-E  
 DEPARTMENT OF EDUCATION  
 RECORDS SECTION DEPED NCR  
**RELEASED**  
 Date MAR 11 2022  
 DNCR-F-PPR-007/RO/01112019

March 11, 2022

**TO: Schools Division Superintendents**

Dear Sirs/Mesdames:

Attached is the letter request of Ms. Arinda V. Santiago, PhD., Project Leader/President, UP College of Mass Communications Foundation, Inc. (UPCMCFI), requesting for the continuation of the 3-year research study, and it is now in its final year. In partnership with the Department of Science and Technology - Science Education Institute (DOST-SEI), their study entitled, **"APPRECIATING SCIENCE: A PROJECT ON THE INCLINATION AND DECISION OF FILIPINO K11 to K 12 STUDENTS IN THE PHILIPPINES TO PURSUE SCIENCE IN COLLEGE/UNIVERSITY AND AS A CAREER PATH (YEAR 3) IN THE NATIONAL CAPITAL REGION."**

The study aims to look into the inclination and decision of Filipino senior high school students to pursue Science in chosen college/university and as a career path.

Participation of teachers and students are needed in survey interviews, focus group discussions, and key informant interviews, all of which will be done online/remotely. They may be allowed to disseminate online the research instrument in the schools subject to the conditions stated in the letter to the researchers of this Office. copy is attached in reference.

For further queries and concerns, please contact Ms. Katrina Ramos, UPCMCFI Assistant at telephone number +(632) 8981-8500 local 2678 or email [kramos@upcmcfi.org](mailto:kramos@upcmcfi.org)

Very truly yours,

**WILFREDO J. CABRAL**

Regional Director, DepEd NCR and  
 Officer-in-Charge, Office of the Undersecretary  
 Human Resource and Organizational Development

Regional letter No. 032, s. 2021

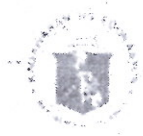
Encl: As stated  
 PPD: 2



*A legacy as rich as excellence!*

Misamis St., Bago Bantay, Quezon City  
 Tel. Nos.: 920 5824-926-2213 loc. 801  
 Email Address: [ncri@deped.gov.ph](mailto:ncri@deped.gov.ph)  
 Website: <http://www.depedncri.wordep.121.com>





Republic of the Philippines  
**Department of Education**  
 NATIONAL CAPITAL REGION

DEPARTMENT OF EDUCATION  
 RECORDS SECTION, DEPED NCR  
**RELEASED**  
 MAR 11 2022

DNCR-F-PPR-006/RO/01112019

March 11, 2022

**Ms. ARMINDA V. SANTIAGO**  
 President  
 UP-College of Mass Communication  
 Foundation Inc.  
 Floridel Hall, Ylanan St., Diliman, Q.C.


Attention: **MS. KATRINA RAMOS**  
 UPCMCFI Assistant

Dear Mesdames:

In reference to your request letter RE: CONDUCT OF RESEARCH entitled **"APPRECIATING SCIENCE: A PROJECT ON THE INCLINATION AND DECISION OF FILIPINO K11 to K 12 STUDENTS IN THE PHILIPPINES TO PURSUE SCIENCE IN COLLEGE/UNIVERSITY AND AS A CAREER PATH"**, such was referred to the Schools Divisions Superintendents, this Region, however you are advised to observe/comply with the following:

1. Schedule of classes should be strictly followed. Interviews should be undertaken outside class hours.
2. Priority is given to school activities and functions of school personnel to their duties and responsibilities.
3. Participation of any student/ school personnel to the study is voluntary.
4. The Region and the Division concerned shall be furnished a copy of the final and signed paper, both in print and in soft copy.
5. The results should be used only for the purpose.

Very truly yours,

  
**WILFREDO E. CABRAL**  
 Regional Director, DepEd NCR and  
 Officer-in-Charge, Office of the Undersecretary  
 Human Resource and Organizational Development

Encl.: as stated  
 Ppr-18



*A legacy as rich as excellence!*  
 Misamis St., Bago Bantay, Quezon City  
 Tel. Nos. 920-5824; 924-2213 loc. 801  
 Email Address: ncr@deped.gov.ph  
 Website: <http://www.deped.gov.ph/regions/ncr/>





UNIVERSITY OF THE PHILIPPINES  
COLLEGE OF MASS COMMUNICATION FOUNDATION, INC.

16 February 2022

**REGIONAL DIRECTOR WILFREDO E. CABRAL**  
REGIONAL DIRECTOR, Department of Education NATIONAL CAPITAL REGION  
Misamis St., Bago Bantay, Quezon City  
Email: [nerc@deped.gov.ph](mailto:nerc@deped.gov.ph)  
Telephone Numbers: (02) 920-58-24; 921-42-74; 928-01-04; 441-12-87 922-73-23; 453-83-74  
(f); 929-42-12^; 926-92-56

**SUBJECT: REQUEST FOR ENDORSEMENT**

Dear Director Cabral:

Warm greetings from the U.P. College of Mass Communication Foundation, Inc (UPCMCFI)!

We are again requesting your kind endorsement for our DOST-SEI-supported study entitled "*Appreciating Science: A Project on the Inclination and Decision of Filipino K11 to K12 Students in the Philippines to Pursue Science in College/University and as a Career Path (Year 3)*" in the National Capital Region.

The project is a three-year project and it is now in its final year. For years 1 and 2, the Department of Education released its advisory, endorsing the request of our Project Leader, Dr. Anninda V. Santiago (please see attached Annex B).

Just like Years 1 and 2, we hope to get the Department of Education's formal endorsement soon, which we are just waiting for release based on our attached request letter (please see Annex A).

At the regional level, we trust that you will likewise endorse the said project for its smooth implementation. Your endorsement will encourage the participation of teachers and students in survey interviews, focus group discussions, and key informant interviews, all of which will be done online/remotely.

In the National Capital Region, we will identify one (1) private high school and one (1) public high school to be part of our research sites.

We will conduct remote/online interviews and/or focus group discussions with the school's principals, science coordinators, and selected K11 to K12 students, following required research ethics and health protocols.


We have included in this request the Executive Summary of the Year 2 Study and the Concept Paper for Year 3. We will coordinate with your office in the next few days to follow up on this request.

We look forward to your support for our study, which seeks to generate relevant knowledge that can be used to further advance science education in the country.

Should you have any queries and concerns, you may get in touch with our UPCMCFI Assistant, Ms. Katrina Ramos at telephone number (+632) 8981-8500 local 2678 or email "UP College of Mass Communication Foundation, Inc. (UPCMCFI)" up\_cmcfi@gmail.com

Thank you very much. Best regards

Very truly yours,

  
**PROF. ARMINDA V. SANTIAGO, PhD**  
UP CMCFI President - Project Leader

Cc: Asst. Regional Director ARNULFO M. BALANF



**Approval of Year 3 Project from  
Dr. Josette T. Biyo, Director DOST  
SEI**



Service. Excellence. Innovation.

12 May 2022

**DR. ARMINDA V. SANTIAGO**

President

UP College of Mass Communication Foundation, Inc.

(UPCMCFI) Plaridel Hall

Ylanan Street, University of the Philippines

Diliman, Quezon City

Dear Dr. Santiago:

We are pleased to inform you that the SEI-UPCMCFI collaborative project, entitled: "Appreciating Science... A Project on Perception of Science among Filipino Grades 11 to 12 Students in the Philippines (Year 3)", is approved with a budgetary cost of ONE MILLION FIVE HUNDRED THOUSAND PESOS (P1,500,000.00) for 2022.


Funds for the third year of implementation of the project shall be released to UPCMCFI in the manner and in accordance with the terms specified below and shall be disbursed in accordance with the approved Line-Item Budget, subject to the usual accounting and auditing rules and regulations:

- a. The amount of ONE MILLION PESOS & 00/100 (P 1,000,000.00) upon signing of the Conforme letter;
- b. The amount of THREE HUNDRED THOUSAND PESOS & 00/100 (P 300,000.00) upon submission of the Draft Final Report of the PROJECT on or before December 15, 2022; and
- c. The remaining amount of TWO HUNDRED THOUSAND PESOS & 00/100 (P200,000.00) upon submission of the Final Report on or before end of March 2023.


Should you agree with the above terms, kindly affix your signature on the Conforme below.

Thank you.

Very truly yours,

  
**JOSETTE T. BIYO, Ph.D.**  
Director

CONFORME:

  
**ARMINDA V. SANTIAGO, Ph.D.**



*Service. Excellence. Innovation.*

**MEMORANDUM**



**FOR :** JOSETTE T. BIYO, Ph.D.  
 Director

**FROM :** RUBY R. CRISTOBAL, Ph.D.  
 Chief, STMERPD

**SUBJECT :** Request for the Approval of the Line-Item-Budget (LIB) of the Research Project, titled: **"Appreciating Science... A Project on Perception of Science Among Filipino Grades 11 to 12 Students in the Philippines (Year 3)"**, proposed by the UP College of Mass Communication Foundation, Inc. (UPCMCFI)

**DATE :** 24 February 2022

Attached for your consideration is a proposal and LIB of UP College of Mass Communication Foundation Incorporated (UPCMCFI) for the proposed project, entitled: **"Appreciating Science... A Project on Perception of Science among Filipino Grades 11 to 12 Students in the Philippines (Year 3)"**. The project will entail a budgetary cost of ONE MILLION FIVE HUNDRED THOUSAND PESOS (₱1,500,000.00) for 2022.

The project aims to determine and inquire into the perception and appreciation of Science by Grades 11 to 12 students using quantitative and qualitative research methods. Results of this project will pave way for the development of a communication and media plan to promote science among Filipino Grades 11 to 12 who are potential supply to S&T human resource development.

We look forward to the approval of the proposal and its LIB.

Thank you.

*Ruby R. Cristobal*  
**RUBY R. CRISTOBAL, Ph.D.**  
 Chief, STMERPD

Approved  
 Disapproved

*Jose T. Biyo*  
**JOSETTE T. BIYO, Ph.D.**  
 Director

Encl.: n/s



**CONCEPT PAPER FOR YEAR 3**



UNIVERSITY OF THE PHILIPPINES

COLLEGE OF MASS COMMUNICATION FOUNDATION, INC.

CONCEPT PAPER FOR YEAR 3

PROGRAM TITLE	A Three-Year Project on the Perception of STEM Among Filipino Grades 3 to 12 Students in the Philippines (2020to 2022)
PROJECT TITLE	Appreciating Science: "A Project on the Inclination and Decision of Filipino K11 to K12 Students in the Philippines to Pursue Science in College/University and as a Career Path (Year 3)
PROJECT LEADERS	Professor Arminda V. Santiago, Ph.D./F and Professor Lourdes M. Portus, Ph.D./F Agency: UP College of Mass Communication Foundation, Inc. Address/Telephone/Fax/Email: Ylanan St., Plaridel Hall, College of Mass Communication, University of the Philippines, Diliman, Quezon City 1101 / 63-2-8981-8500 local 2661 and 2679 / 63-2-926-3465/ armisan2009@gmail.com/ avsantiago@up.edu.ph / lmportus@up.edu.ph / up.cmcfi@gmail.com
COOPERATING AGENCIES	None
SITES OF IMPLEMENTATION	10 Regions/Nationwide
PROJECT DURATION	March 2022 to February 2023

INTRODUCTION

STEM has become an important and salient component of basic education not only in the Philippines but throughout the world. Having its origin and nascence in the United States in 2001, this education policy, sometimes referred to as a curriculum choice, implicates the development of a knowledge-competitive workforce that can contribute to the economy of a country. STEM is an acronym to mean Science- Technology-Engineering-Mathematics (sometimes shortened as Math); these are the identified fields or disciplines that weigh on the perceived requirements to become an effective economic contributor. There are times when other disciplines are added into the mix, such as Arts and Medicine.

The emphasis on STEM is borne out of the belief that STEM generally serve to catalyze society's growth and development. The STEM track, which is taught using an interdisciplinary and applied approach, "is designed to produce graduates of secondary level

who will take science, research, mathematics and engineering related courses in tertiary level and thereby add to the scientific and scholarly workforce of the country (Estonanto 2017).

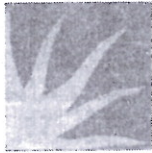
However, a study published in December 2020 raised the concern about a growing number of STEM students who chose to pursue non-STEM degree programs in college or university as well as “students who entered college with the original aim of pursuing a STEM field career who drop out of school or choose a non-STEM program.” (Rafanan, de Guzman, and Rogayan, “Pursuing STEM Careers: Perspectives of Senior High School Students” in Participatory Educational Research (PER), Vol. 7(3), pp. 38-58, December 2020). The study further reports that:

In the Philippines, STEM graduates are insufficient; hence, the country does not have sufficient scientists (Anito, Morales & Palisoc, 2019). The Philippines only has 189 scientists per million which is very low compared to the UNESCO recommendation which is 380 per million (Anito et al., 2019). The low number of scientists in the country is greatly attributed to the low graduates of STEM-related careers. The Commission on Higher Education (CHED) report revealed that the completion rate across STEM areas based on the average 5-year data until 2016-2017 is only 21.10%. In particular, sciences had a completion rate of 25.52% followed by mathematics (21.20%), information technology (19.56%), engineering and technology (18.97%), and medical and allied fields with 14.38%. This scenario is further validated by EduTECH (2016) that the Philippines is experiencing shortages in the workforce in the field of STEM (2020).

In the STEM program which was designed to prepare students who express keen interest in taking college degrees focused on Science, Technology, Engineering, and Mathematics (STEM), senior high school students will be exposed to learning activities that will hone their knowledge and skills in analyzing data, understanding real-world impacts, and conducting research (<https://www.onlineshs.com/stem/>). STEM education attempts to produce K- 12 graduates who are “globally competitive” and gainfully employed. The so-called hope of the country is expected to acquire knowledge and skills in problem-solving, analysis of data, and application of evidences to make decisions.

In the 2021APEC STEM-Plus for Women and Girls Webinar in March, it was reported that:

Educational institutions in the Philippines are gradually recognizing the relevance of STEM education in supporting the government’s thrust for innovation to drive economic growth. Thus, in a bid to increase the number of graduates who enroll in STEM-related courses at the tertiary level, the Department of Education designed a STEM strand under the K-12 Academic Track of the Senior High School. The STEM strand will provide students with the fundamental concepts related to science, technology, engineering and mathematics. Students study subjects in Biology, Physics, Chemistry, Calculus, Technology, and Research which will prepare them from taking college courses related to Applied and Pure Sciences, Engineering, IT and



UNIVERSITY OF THE PHILIPPINES

**COLLEGE OF MASS COMMUNICATION FOUNDATION, INC.**

Mathematics. Moreover, the STEM strand paves the way for broader opportunities for students in basic education to learn and practice science and mathematics, which can prepare them for global education and employment, as well as entrepreneurship (Conrado Rotor, Jr. "STEM+ Update: Philippines" in <https://www.apecstemplustw.org/blog/stem-update-philippines>).

It was further added that getting more students to enroll in STEM is still a major challenge. The same report also indicated a gender gap in STEM enrollment – there was a need to encourage more women/girls to pursue STEM ins senior high school and pursue STEM courses in college. This was due to the reality-the-ground that STEM courses are male-dominated (Rotor, Jr. 2021).

Thus it is salient to explore and find out the perspectives, inclinations, and decision of Filipino K11 to K12 students to pursue Science as an academic pursuit in college/university and as a career path.

## **BACKGROUND AND RATIONALE**

### **Learnings from Year 1**

The Year 1 generated important data as well as salient insights on how selected K3 to K6 basic education students perceived Science and looked at their levels of appreciation and the relevance of Science in their academic pursuits that could influence them to pursue a Science career or Science-related endeavors.

It covered the period January 2020 to February 2021. K3 to K6 students were specifically selected for the study because of the need to examine their formative years of Science education, which commonly starts on their third year of elementary education in the Philippines. Additionally, it further investigated the following aspects:

1. The students' perception, attitude, awareness, and knowledge in Science;
2. The student's experiences in learning Science; and
3. The student's inclination to pursue Science.

Overall, Year 1 reveals that K3-K6 students have neutral to positive perceptions about and attitudes on Science. They also exhibited neutral to positive scores on their awareness and knowledge of Science. This illustrates that Filipino K3-K6 students expressed neutral to

positive sentiments to the statements measuring their (1) Perception about Science, (2) Attitude on Science, (3) Awareness of Opportunities in Science, (4) Knowledge about Science, (5) Perceived Competency of Science Teachers, (6) Parental Support in Learning Science, and (7) Inclination Towards Scientific Opportunities. There were no statements that the students found negative.

However, the FGDs reveal that generally, K3-K6 students have a shallow understanding of science. This is quite understandable since they are just beginning their journey in the realm of Science. Most of them recalled terms that were taught inside the classroom but did not know how to characterize, explain, and even relate these with one another. Results indicate students' difficulty in absorbing science concepts and thinking about them in creative and innovative ways. The negative notions about science as a difficult subject are not new issues anymore, but it is important to note how such negativities can be dispelled by effective teaching. In other words, the skill of the teacher can make all the difference. While science is perceived to be a difficult subject, a good teacher can make it enjoyable for students, and amplify student interest.

Year 1 posed great challenges to the research team. When the research was conceived as early as late 2019, it was envisioned that all methodological procedures of the research would be implemented on an in-person face-to-face manner. Year 1 was greatly affected by the pandemic that has put to a brief standstill the main participants of the project – the schoolchildren and the schools. A reassessment of strategies had to be made because the project team had to shift to using online platforms in administering the interviewer-administered survey; conducting the FGDs with participating schoolchildren and the conduct of the Key Informant Interviews through online platforms using Google Meet, Zoom, and in some cases through phone calls, instead of the proposed face-to-face survey. However, these were challenges that were surmounted by the research team despite some delays and problems in getting all participants for the study.

### **Learnings from Year 2**

For Year 2, the focus was on K7 to K10 students. These are students who are in the age bracket of 11 years old to 17 years old. These are recognized as the teenage years. And the youth in this age range are now at the threshold of discovery. In school, they are engaged in a multitude of educational activities that provides them with opportunities to explore their aptitudes and skills in leadership.



UNIVERSITY OF THE PHILIPPINES

**COLLEGE OF MASS COMMUNICATION FOUNDATION, INC.**

The Year 2 study unveiled an assortment of factors and contexts on why K7 to K10 students would pursue a STEM or science-related track in their studies. Generally, these can be categorized as:

- a) teachers and their teaching styles and attitude,
- b) educational environment, such classroom conditions, facilities and activities,
- c) the students' own interests and dreams, and
- d) involvement of other stakeholders, such as the parents, family members, LGUs and funders.

On the study's objective of determining the interest and inclination of the students to take up science courses, it was found out that they tend to look into their future and would take STEM to ensure or achieve their dreams. Students who have good learning environment and have access to financial support are more inclined to take STEM courses.

On the objective of exploring the push and pull factors that will encourage students to pursue or not pursue STEM tracks, the researchers observed that pull factors can become push factors and vice versa. For instance, they dream of being doctors, engineers, and architects, but also want careers outside science such as law, accounting, teaching, and culinary professions and those that pay well. Moreover, while they find science a difficult subject, the majority finds it interesting. The presence of a good teacher is necessary, but a poor one would make them lose interest in Science.

A factor that was explored by the study included the situation of students amidst the COVID-19 pandemic and how they cope with the remote learning setup. During the pandemic, there are expectations for teachers to be more understanding and accommodating given that not all students have neither gadgets nor internet connections. While there are modules that students with no Internet could work on, the quantity and quality of learning modules are wanting. The parents who are expected to assist them in their modules, were either not qualified or do not have the time to support their children in understanding the modular lessons. Those students who are able to connect to the internet, still want additional learning resources such as videos, so students can understand lessons better.

The informants find science subjects easier to learn and teach during face-to-face classes compared to online or modular learning modes. The students manifest high interest and motivation to participate in face-to-face activities during face-to-face classes, while teachers lament that the pandemic restrictions have limited if not prevented them from

conducting events or science activities online. Favoring face to face activities, teachers attest to easier communication with the students and sharing of ideas with classmates improve their learning. Likewise, teachers can immediately answer students' questions during physical discussions.

But the pandemic is still here. Hence, for Year 3, the methodologies and instruments will also be adapted to remote ways of data gathering. Year 3 will be facing the same challenges that were encountered in Years 1 and 2. Moreover, despite of the move to limited face-to-face classes and the declarations of alert levels in various LGUs, the approaches to data gathering will be dependent on these two major factors.

### CONCEPT FOR YEAR 3

Year 3 supplements the findings of the Year 1 and Year 2 studies. While Year 1 focused on the perceptions of K3 to 6 students and Year 2 was aimed at looking into the factors and contexts on why K7 to K10 students would pursue a STEM or science-related track in their studies, the Year 3 project will inquire on the factors that contribute to the inclination and decision of Filipino K11 to K12 Students to pursue Science in College/University and as a Career Path. From the senior students' perspective, the general inquiry will be if these students will pursue a Science or Science-related career.

The Year 3 project represents the final phase of the three-year program as it focuses on the junior and senior students who will make the crucial decision of selecting their degree course. Note that at these levels, the students seek application and take entrance or admission tests for their tertiary education. The decision making process is an area to be inquired into and find out if their inclination to STEM will materialize.

#### **Research Problem and Objectives**

The major research problem that this project will answer is:

What factors and in what contexts will K11 to 12 students be inclined and decide to pursue a Science or Science-related track in College/University and as a career path?

Specifically, the objectives of this Year 3 project are as follows:



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1. To determine the inclination and decision of the students to take up science or science-related degree programs in college/university or as a career path;
2. To identify the factors and the reasons that will make the students choose science or science-related degree programs in college/university or as a career path;
3. To describe the decision-making process of the students in selecting their science or science-related degree program in college/university or as a career path; and
4. To find out the role of teachers, parents, peers, other stakeholders and other influencers or conditions in facilitating or hindering the choice of junior and senior students in pursuing a science or science-related degree program in college/university or as a career path.

### **Methodology**

The above objectives will be achieved through a triangulated Research Design that will fuse together the results of quantitative and qualitative methods. Particularly, the project will employ online survey, Focus Group Discussion and Key Informants Interview; additionally, it will use records or documents review to enrich further the results of the study.

The coverage of the study will be nationwide with samples to be drawn from the regions that exhibited the lowest level of aptitude in science based on the PISA study. Survey respondents will total 1,200 from public and private schools, distributed in 10 regions.

To determine the students' perception, inclination and decision to pursue Science or Science-related degree programs in college/university, a total of eight (8) focus group discussions among K11 to K12 students will be facilitated from four (4) regions. Each group will comprise 6 to 10 students who will share their insights on topics like their favorite subjects and science topics, perception and interests, their chosen degree programs, their future career plan, health condition, STEM track, their science teachers, and other influencers and the remote learning setup during the COVID pandemic.

Sixteen (16) key informant interviews will be conducted from four (4) selected regions. Principals and science teachers or coordinators and other stakeholders will be interviewed online in accordance with the KII guide formulated by the team.

The major concepts and indicators that will be explored in the FGD and KII are divided into the following sections:

- a) Profile of the School and students;
- b) Inclination, decision and choice of Degree program;
- c) Decision-making factors and process; and
- d) Facilities and Teaching Materials, influencers, environment and other conditions

Survey questionnaires, FGD and KII Guides will be formulated to capture the variables and concepts under study. These will be pre-tested and will be used in data collection.

Pre-tested instruments such as survey questionnaires, FGD and KII Guides will be used in data collection. Questionnaires and Guide questions will be drawn to capture the variables and concepts under study. Survey responses will be encoded and analyses will be based on frequencies, cross tabulations, tests of association of selected variables, and regression. FGDs and KIIs will be recorded with permission of the participants and informants. These will be transcribed verbatim and the transcriptions will be organized into themes for the write-up.

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**BACKGROUND ON THE PROJECT**  
**“Three-Year Project on the**  
**Perception of STEM Among Filipino**  
**Grades 3 to 12 Students in the**  
**Philippines (2020 to 2022)”**

## **BACKGROUND ON THE PROJECT “Three-Year Project on the Perception of STEM Among Filipino Grades 3 to 12 Students in the Philippines (2020 to 2022)”**

In 2019, the DOST-SEI through the University of the Philippines Diliman College of Mass Communication, Inc. (UPCMCFI), embarked on a three-year research project titled “A Three- Year Project on the Perception of STEM Among Filipino Grades 3-12 Students in the Philippines (2020-2022)”. Of prime concern was the low number of science-inclined students and the scarcity of Filipino science practitioners.

Based on the 2014 National Achievement Test (NAT), the passing rate of Grade 6 students is only at 69.21%. As a response, Republic Act 10533 or the Enhanced Basic Education Act of 2013 was passed. The law was implemented to improve the educational system by strengthening its curriculum and increasing the number of years for basic education. The act adapts the implementation of the K-12 curriculum, which attempts to produce K-12 graduates who are “globally competitive” and gainfully employed. The so-called hope of the country is expected to acquire knowledge and skills in problem-solving, analysis of data, and application of evidence to make decisions (<https://www.officialgazette.gov.ph/2013/05/15/republic-act-no-10533/>).

STEM is one of the academic tracks in the senior high school level (grades K11 to K12); the acronym stands for Science Technology Engineering Mathematics. It generally serves to catalyze society’s growth and development. The STEM track, which is being taught using an interdisciplinary approach, “is designed to produce graduates of secondary level who will take science, research, mathematics and engineering-related courses at the tertiary level and thereby add to the scientific and scholarly workforce of the country” (Estonanto, “Acceptability and Difficulty of the STEM Track Implementation in Senior High School” *Asia Pacific Journal of Multidisciplinary Research*, Vol. 5, No. 2, May 2017).

Despite the passing of RA 10533 in 2013, the 2018 worldwide study of the Organisation for Economic Co-operation and Development or OECD that conducts the triennial survey known as the Programme for International Student Assessment (PISA), which covered member and non-member states showed that out of seventy-nine (79) countries; the Philippines scored the lowest in reading comprehension and the second-lowest in mathematics and science. This necessitated comprehensive research on Filipino K3 to K12 students to understand why the Filipino students’ performance in Science and Math is below par, so that decision-makers, specifically DOST-SEI) together with concerned government agencies, could solve the situation at hand (UPCMCFI Year 1 Report, 2020).



## **Executive Summary Year 1**

## EXECUTIVE SUMMARY YEAR 1

This research project examined the growing concern on the Filipino students' poor academic performance in the field of Science. It investigated the observation of a low inclination of Filipino students in the basic education level to pursue higher studies in Science, as well as to take up a career in Science and Science-related endeavors. In order to address these concerns, it was important to understand how students in the basic education level perceive, learn, and appreciate Science during their childhood education. This research assumes that a student's perspective of Science may have direct influences to their learning and study behavior and may influence the quality of science learning.

The project spans three years and has an overarching program title of, "A Three- Year Project on the Perception of STEM Among Filipino Grades 3-12 Students in the Philippines (2020-2022)." It is divided into three (3) phases with the first phase (Year 1) focusing on students in the K3 to K6 levels. The second phase (Year 2) will explore how science is perceived by students in the K7 to K10 year levels and finally the third phase (Year 3) will focus on students in the K11 to K12 levels taking the academic track of STEM (Science, Technology, Engineering and Mathematics).

This report covers Year 1, from January 2020 to February 2021. It focused on students in the K3 to K6 levels; they were specifically selected for the study because of the need to examine their formative years in Science education, which commonly starts on their third year of elementary education in the Philippines. Additionally, it investigated the following aspects:

1. The students' perception, attitude, awareness, and knowledge in Science;
2. The students' experiences in learning Science; and
3. The students' inclination to pursue Science.

Three methods of data collection were implemented for this project; the use of multiple methods or data sources were used for purposes of triangulation that helps in developing a comprehensive understanding of the phenomena. Essentially, approaching the research through triangulation augurs well for the credibility and validity of research findings. The study employed the Survey, Focus Group Discussions, and Key Informant Interviews. These were the chosen methods to be able to get access to the different facets of

the phenomenon being studied. Additionally, the sampling schemes utilized in the study were different for each method – for the Survey, simple random sampling was used in determining the schools to be included in the study alongside the selection of the survey participants from grade levels K3 to K6; for the Focus Group Discussions (FGD) and Key Informant Interviews (KII), purposive sampling through maximum variation, criterion, and convenience sampling were used.

For the Survey, the sample was 1,081 K3 to K6 students; a survey questionnaire was prepared based on the variables for the study and the research objectives. For the FGD, six to ten qualified participants were selected upon the recommendation of the school authorities; an FGD guide was formulated for data collection. For the participation of the students, two (2) students from each grade level were included in the FGD and the research team strived to have an equal distribution of participants based on gender. The following criteria were used in selecting the FGD discussants:

A. Public school students

- 1) K3-6 students;
- 2) Have Science subjects;
- 3) Willing to actively participate, and are able to communicate their ideas to a group.

B. Private school students

- 1) K3-6 students;
- 2) Have Science subjects;
- 3) Willing to actively participate, and are able to communicate their ideas to a group

For the Key Informant Interviews (KII), 16 key informants were selected through purposive sampling through maximum variation, criterion, and convenience sampling. These approaches were deemed useful for the research as it can provide information-rich data for the study. Intensive interviews based on the variables and the objectives of the study were conducted among selected school principals and elementary Science teachers or science coordinators from the areas chosen for this study. The following criteria were used in identifying the participants for the KII:

- 1) They have played or are playing a significant role in the administration of the Science education in their respective schools, and

- 2) They are willing to share opinions and ideas and experiences regarding Science education.

For the research instruments, Survey questionnaires, FGD, and KII guides, as data collection tools were formulated and pretested to capture the variables, measures, concepts, and indicators under the study.

This report also reflects the challenges faced by the research team. When the research was conceived as early as late 2019, it was envisioned that all methodological procedures of the research would be implemented on an in-person face-to-face manner. This research was greatly affected by the pandemic that has put to a standstill the main participants of the project – the schoolchildren and the schools. A reassessment of strategies had to be made because the project team had to shift to using online platforms in administering the interviewer-administered survey; conducting the FGDs with participating schoolchildren and the conduct of the Key Informant Interviews through online platforms using Google Meet, Zoom, and in some cases through phone calls, instead of the proposed face-to-face survey. However, these were challenges surmounted by the research team despite some delays and problems in getting all participants for the study.

The survey revealed that, generally, the students have neutral to positive perceptions about and attitudes towards Science. They also exhibited neutral to positive scores on their awareness and knowledge in Science. This illustrates that Filipino K3-K6 students expressed neutral to positive sentiments to the statements measuring their (1) Perception about Science, (2) Attitude on Science, (3) Awareness of Opportunities in Science, (4) Knowledge about Science, (5) Perceived Competency of Science Teachers, (6) Parental Support in Learning Science, and (7) Inclination Towards Scientific Opportunities. There were no statements in the Likert Scale that the students found negative.

Meanwhile, the FGD revealed that, generally, students have a shallow understanding of science. Most of them recalled terms that were taught inside the classroom but did not know how to characterize, explain, and even relate these with one another. Results indicate students' difficulty in absorbing science concepts and thinking about them in creative and innovative ways. The negative notions about science as a difficult subject are not new issues anymore, but it is important to note how such negativities can be dispelled by effective teaching. In other words, the skill of the teacher can make all the difference. While science is

perceived to be a difficult subject, a good teacher can make it enjoyable for students, and amplify student interest.

The KII results show informants' high appreciation of the new K-12 science curriculum which, aims to develop students' science literacy, and to understand and relate concepts to everyday life. The new science curriculum is more explicit than the old curriculum where the discovery method is used, and that teaching science in the new curriculum is easier because lessons start with the familiar and experiences of students lead towards concepts or the abstract. This method arouses the interest of students in the lessons because they can relate these to their environment.

Generally, the study reveals a neutral-to-positive attitude, awareness and knowledge relative to the K3 to K6 students' perception and appreciation of Science. In fact, there is no negative response, at all, to questions or statements about science. The study also divulges important factors, such as, gender, school category, and, in some cases, regional location, that significantly influence the students' appreciation of science. Students recalled that most of their science information had come from teachers. While such an approach may be appropriate in transmitting concepts and technical information, the science learning process may potentially stop at recall. Furthermore, the results show that parental support and the students' exposure to specific career fields and occupations play a role in the students' inclination to pursue Science-related careers. Students recalled that most of their science information had come from teachers. While such an approach may be appropriate in transmitting concepts and technical information, the science learning process may potentially stop at recall. The study indicated that the students' intention to pursue science is motivated by both internal and external factors. By engaging realities that they directly experience and connecting these to the lessons covered in science class, students are able to redefine the role of science and see the various possibilities it can offer, which may cultivate an interest in the field.



## **Executive Summary Year 2**

## EXECUTIVE SUMMARY YEAR 2

This study is Year 2 of the three-year DOST-SEI and U.P. College of Mass Communication Foundation, Inc. (UPCMCFI) research project that explores the appreciation and relevance of Science among K3 to K12 students. Year 1 had K3 to K6 students as its focus and the major highlights are in the Executive Summary in Appendix A. This Year 2 phase covers K-7 to K-10 students. The study sought to answer the question: "How and in what contexts will K7 to K10 students pursue a STEM or science-related track in their studies?"

Specifically, it aimed:

1. To determine the interest and inclination of the students to take up science courses;
2. To identify the factors that will make the students engage in STEM subjects;
3. To explore the push and pull factors that will encourage students to pursue or not pursue STEM tracks;
4. To find out the role of science teachers in facilitating or hindering the effective teaching of science ; and
5. To determine the situation of students amidst the COVID-19 pandemic and how they cope with the remote learning setup.

The survey areas were: the National Capital Region (Quezon City, Marikina City and Makati City), Luzon (Region I, III, and V), Visayas (Region VI and VII), and Mindanao (Region VIII, IX, XI, and XII). Two schools from each region - one (1) public high school and one (1) private high school were selected.

Both quantitative method and qualitative data were obtained and triangulated. A structured questionnaire for the survey using Google form was pretested before it was finalized and administered through Zoom, Messenger, and mobile phone, while guide questions were constructed for the key informant interviews (KII) and Focus Group Discussions (FGDs). These too were pretested prior to data collection.

Frequency counts, cross-tabulations, t-test and logistic regression served as the bases for analyses and interpretations for the quantitative data. Cross-tabulations and t-test were used to examine differences between the variables gender, region and type of school (private or public) with respect to 1) Interest/ inclination to take science courses , and 2) favorite strand/domain (top of 4 strands). Chi-square was used to measure the correlation between interest/inclination to take science courses and favorite strand/domain (top of four [4]

strands). Logistic regression was used to determine the contribution of the nominated variables and demographic variables to a student's inclination to take science courses.

The KII and FGDs were transcribed verbatim and were analyzed thematically. Results of the study show that of the 1,067 respondents, 20% are from NCR, with the rest fairly distributed across the regions. Gender distribution is also more or less evenly distributed between boys and girls. The average age of the respondents is 14.1 years old. Fifty-five percent (55%) of students come from public schools, while 45% come from private Schools.

Liking Science is consistent across gender, type of school, and region. Overall, 22.2% of the students claimed Science is their favorite subject; this is followed by English (21.4%), and Mathematics (17.6%). Science is the favorite subject of 28% of students in Region IX, but an almost equal number can be seen in NCR (27.7%) and Region XII (27.6%). Science as favorite subject is lowest in Regions V (16.7%), VII (17%), XI (17%), and III (18%).

The FGDs revealed that there is a high interest in science since most informants said that science is predominantly a favorite subject. The topics are explained properly to them and their teachers' approach arouses their curiosity for the subject. When it comes to the most interesting domains of science, there is a general agreement that "Earth and Space" and "Living Things and their Environment" are understood easier than the other strands.

Based on the key informant interviews, Biology, Chemistry, and Physics are the high school subjects the students are particularly interested in. Students from the NCR, however, selected Math and MAPEH as their favorite subjects more than science and other domains.

When it comes to the hardest subject, there were students who also did not like the Filipino subject since they "cannot understand why the national language needs to be learned." They are also having a hard time understanding "deep Filipino words" especially by those coming from the provinces. Math is considered the hardest subject because it requires memorizing concepts and solving problems. The least liked subject by rank are Mathematics (41.1%), Araling Panlipunan (11.7%), and Filipino (9.7%).

Most of the schools only have one (1) laboratory for the entire school, typically the size of a regular classroom. In some schools before the pandemic, the laboratories were converted into classrooms to resolve issues of limited classrooms in public schools. Although at least, majority of the students claimed that they are not affected by class size, there are teachers especially from public schools who were burdened with handling classes as big as sixty (60) to seventy (70) students per section.

Engaging science activities, complete science laboratory for experiments, financial and moral support of parents/guardians in terms of help with assignments/projects and choice of STEM, and support/encouragement from friends and classmates appear to be factors that could entice students to choose STEM.

It cannot be denied that teachers play an important role in encouraging students to like and take STEM. As students revealed in the survey and FGDs, they like teachers who are knowledgeable about the subject and explain the lessons well. They like teachers who are creative, use visual aids and social media to enhance their teaching. Being able to approach their teachers for further explanation about the topic is a plus factor in learning about Science.

Out of 1,067 students, 66.1% said they want to pursue the academic track in senior high school. Of these, close to two-thirds (444 or 63%) will select Science, Technology, Engineering, and Mathematics (STEM). The reasons given by the rest who do not want to pursue STEM are : the STEM subjects are difficult/complicated, these are not related to the career they want to take, and they are not good in Math and computations. However, there are still students who are open to changing their decision to take STEM, provided there will be a change in the course they want to take and it is STEM-related, there is a scholarship, incentive, or financial assistance offering for STEM, and/or their family/parents/guardians would advise them to take STEM.

It is interesting to note that the top three (3) courses the students want to take in college are medicine, engineering and education/teaching.

According to the most number of students, the current COVID-19 situation has affected their studies and interest in Science, owing to the remote / online learning set-up, and

that their modules are engaging enough to encourage them to study under the remote/online learning set-up.

The statistical tests indicate that there is a significant association between STEM intention and favorite science subject in NCR, where more students who like Force, Motion, and Energy intend to take up STEM (68%). A conducive learning environment ( $\text{Exp}(B) = 1.299$ ,  $p = 0.005$ ) and parents' support ( $\text{Exp}(B) = 1.514$ ,  $p < 0.001$ ) significantly raises the odds of a student intending to take up STEM.

The variables included explain 22.4% of the variance in STEM intention. The model was able to correctly predict 67.0% of the cases. A conducive learning environment ( $\text{Exp}(B) = 1.299$ ,  $p = 0.005$ ) and parents' support ( $\text{Exp}(B) = 1.514$ ,  $p < 0.001$ ) significantly raises the odds of a student intending to take up STEM.

Living in Regions 6 ( $\text{Exp}(B) = 2.168$ ,  $p = 0.012$ ), 9 ( $\text{Exp}(B) = 3.073$ ,  $p < 0.001$ ), and 12 ( $\text{Exp}(B) = 2.122$ ,  $p = 0.019$ ) have significantly higher odds of STEM intention compared to living in NCR. 6. Living in Regions 3 ( $\text{Exp}(B) = 0.528$ ,  $p = 0.038$ ), 5 ( $\text{Exp}(B) = 0.382$ ,  $p = 0.003$ ), and 8 ( $\text{Exp}(B) = 0.184$ ,  $p < 0.001$ ) have significantly lower odds of STEM intention compared to living in NCR.