



Republic of the Philippines
Department of Education
REGION VIII - EASTERN VISAYAS

September 27, 2022

REGIONAL MEMORANDUM
No. **1096**, s. 2022

REQUEST FOR ENDORSEMENT OF THE RESEARCH STUDY ENTITLED "APPRECIATING SCIENCE: INCLINATION AND DECISION OF FILIPINO K11 TO K12 LEARNERS IN THE PHILIPPINES (YEAR 3)" OF THE UNIVERSITY OF THE PHILIPPINES COLLEGE OF MASS COMMUNICATION FOUNDATION, INC.

To: Schools Division Superintendents
School Heads
All Others Concerned

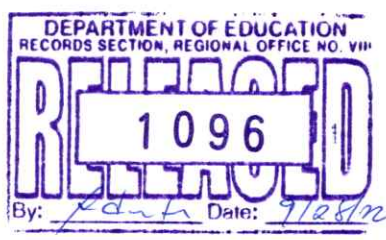
1. Attached is Memorandum DM-CI-2022-319 dated September 7, 2022 entitled "Request for Endorsement of the Research Study, 'Appreciating Science: Inclination and Decision of Filipino K11 to K12 Learners in the Philippines (Year 3),' of the University of the Philippines College of Mass Communication Foundation, Inc." relative to the request for the participation of teachers and students in the survey, focus group discussions, and key informant interviews for the conduct of the study.
2. For details, see the attachment.
3. Immediate dissemination of this Memorandum is desired.

[Signature]
EVELYN R. FETALVERO, CESO IV
Regional Director

Enclosures: As stated
References: As stated

To be indicated in the Perpetual Index under the following subjects:
ENDORSEMENT RESEARCH SCIENCE

CLMD-RRT






Republic of the Philippines
Department of Education

OFFICE OF THE UNDERSECRETARY FOR CURRICULUM AND INSTRUCTION

MEMORANDUM

DM-CI-2022-319

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

FROM : 
JOSE ERNESTO B. GAVIOLA
Undersecretary for Curriculum and Instruction

SUBJECT : **REQUEST FOR ENDORSEMENT OF THE RESEARCH STUDY ENTITLED "APPRECIATING SCIENCE: INCLINATION AND DECISION OF FILIPINO K11 TO K12 LEARNERS IN THE PHILIPPINES (YEAR 3)" OF THE UNIVERSITY OF THE PHILIPPINES COLLEGE OF MASS COMMUNICATION FOUNDATION, INC.**

DATE : SEPTEMBER 7, 2022

This Office respectfully endorses the attached letter of Ms. Arminda V. Santiago, PhD, Project Leader, University of the Philippines College of Mass Communication Foundation, Inc. (UPCMCFI), relative to their request for the participation of teachers and students in the survey, 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 study is now in its third year, where the focus is on the inclination and decision of Filipino Grade 11-12 learners in the Philippines to pursue Science in College or University and as a career path.

This Office reiterates that participation of teachers and learners shall be subject to the no disruption of classes policy stipulated in DepEd Order (DO) No. 9, s. 2005 titled *Instituting Measures to Increase Engaged Time-on-Task and Ensuring Compliance Therewith*.

For additional queries and concerns, please contact Prof. Arminda Santiago and Prof. Lourdes Portus, Project Leaders, UPCMCFI at +632-89818-500 local 2661 or at up.cmcfi@gmail.com.

For consideration and appropriate action.

JR 13292-3083
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UNIVERSITY OF THE PHILIPPINES
DEPARTMENT OF EDUCATION
COLLEGE OF MASS COMMUNICATION FOUNDATION, INC.

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By: [Signature] Time: 2:57
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8 August 2022

The Honorable Sara Zimmerman Duterte-Carpio
Secretary, Department of Education
DepEd Complex, Meralco Ave. Pasig, Metro Manila
and
Vice President
Republic of the Philippines

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

RECEIVED BY:

Printed Name & Signature

Date & Time
Contact Details for follow-ups:
Name: _____

Dear Secretary Duterte-Carpio:

Congratulations on your election as Vice President of the Philippines and your appointment as the 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 1987 to provide continuing training to mass communication educators and practitioners. It undertakes projects on communication and media education; communication and media research; media and information literacy; and digital literacy and citizenship geared toward national development goals.

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

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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 [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.



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COLLEGE OF MASS COMMUNICATION FOUNDATION, INC.

With these facts about the three-year study and its being on the 3rd 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 hope for your most favorable response to this request.

Thank you.

Respectfully,

DR. ARMINDA V. SANTIAGO

Project Leader, "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)"

Cc: **USEC Epimaco V. Densing III**
Chief of Staff, Department of Education

DR. JOSETTE T. BIYO
Director, Science Education Institute
Department of Science and Technology

DR. RUBY R. CRISTOBAL
Chief Science Research Specialist, Science Education Institute
Department of Science and Technology

Inclusions:

Approved Concept Paper for Year 3
DOST-SEI Letter of Approval of Year 3
Executive Summary of Year 1
Executive Summary of Year 2
Background
Department of Education Endorsements from Sec. Leonor Briones issued 2022
Department of Education endorsements from Regions and Superintendents 2022
Photos of August 26, 2021 RTD Kwela Pa Ba ang Siyensiya?
Synthesis of August 26, 2021 RTD
USB of ABS-CBN report on RTD



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 (P1,500,000.00) for 2022.

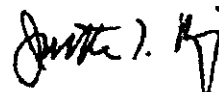
The project aims to determine and inquire into the perception and appreciation of Science by Grades 11 to 12 students using quantitative and qualitative research methods. Results of this project will pave way for the development of a communication and media plan to promote science among Filipino Grades 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, Ph.D.
Chief, STMERPD

Approved
 Disapproved


JOSETTE T. BIYO, Ph.D.
Director

Encl.: a/s



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 (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 / Importus@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

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.

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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

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.apecstemplustw.org/blog/stem-update-philippines>