

TRAINING ON STATISTICS FOR TEACHERS OF DAAN SARILE INTEGRATED SCHOOL IN CABANATUAN CITY, NUEVA ECIJA, PHILIPPINES

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This paper will highlight the experiences and best practices to be gained from a pilot project aimed to train kindergarten to grade 10 teachers in a school outside of Metro Manila. The pilot is in response to the need to educate teachers in these grade levels on the basic concepts related to descriptive and inferential statistics, which should be integrated in subjects across kindergarten to grade 10. The senior level “Statistics and Probability” module starts with the topic of random variables and probability distributions and ends with correlation and regression analyses, hence the gap from kindergarten-grade 10 to grades 11-12 must be addressed. The long-term goal of the project is to bring the training to as many public schools as possible nationwide.

BACKGROUND

The University of the Philippines School of Statistics has always been actively involved in training of teachers teaching Statistics, as well as of members of various sectors of the society. Reston & Bersales (2011) described the statistical capacity building efforts done through the Philippine Statistical System (PSS) and the Philippine Statistical Association (now, Philippine Statistical Association, Incorporated or PSAI), and most of these efforts involved faculty members from both the University of the Philippines Diliman School of Statistics and University of the Philippines Los Baños Institute of Statistics as resource persons. In particular, in 2008, a joint project by the Commission on Higher Education (CHED), PSAI and the then Statistical Research and Training Center (now, Philippine Statistical Research and Training Institute or PSRTI) led to a *Training Course on Teaching Basic Statistics* aimed for teachers teaching Statistics at the tertiary level. This project followed a pilot done by PSAI and PSRTI in 2007. The training course in 2008 was conducted with partner universities in several areas in the Philippines and attended by teachers and researchers from different Higher Education Institutions (HEIs) of the country.

The Philippines is now adopting a K to 12 program which covers 13 years of basic education with key stages kindergarten to grade 3, grades 4 to 6, grades 7 to 10 or junior high school, and grades 11 and 12 or senior high school. The main reason cited in the Department of Education’s website is that a 12-year program is found to be the best period for learning under basic education, apart from this being the recognized standard for students and professionals globally.

One of the enhancements done in the curriculum is the inclusion of “Statistics and Probability” in the K to 12 Curriculum, specifically in the new senior high school grades. Several trainings on the topics covered in this core subject were conducted, and just recently, the PSAI conducted a *Training on Statistics and Probability for K to 12 Teachers*. The attendance to the training, however, was low. While there are many possible reasons for this low attendance, one would most surely be the cost involved in attending the training if the participant lives outside of Metro Manila.

WHY THIS TRAINING?

The coverage of “Statistics and Probability” starts with the topic of random variables and probability distributions and ends with the topic of correlation and regression analyses. The basic concepts related to descriptive and inferential statistics and graphical techniques are covered and integrated in different grade levels across grades 1 to 10. It is assumed that topics prerequisite to the coverage of “Statistics and Probability” have been discussed in earlier grade levels, and students will be prepared to see the link from these earlier topics to the coverage to be discussed in their senior high school years. These topics were included in the modules for Mathematics.

With the enhanced curriculum, it is also likely that non-Mathematics/Statistics teachers may come across teaching materials with Statistics in the subjects they teach. Hence, there is a need

for these teachers to also have an appreciation and understanding of Statistics even if they are not teaching in grades 11 or 12, and even if they are not Mathematics or Statistics teachers.

Given the changes in the basic education system of the Philippines, it was conceived that trainings for teachers should not focus on topics in Statistics to be covered in the senior high school years alone, but also on the topics distributed across the lower grade levels. The long-term goal of the whole project is to bring this kind of training to public schools in areas outside of Metro Manila without the grade school teachers and school administration worrying about training fees, travel and accommodation costs for the entire duration of the training. The idea is to bring the training to the teachers. It also aims to convince more faculty members of the School of Statistics to engage in such endeavour.

The training on Statistics, hopefully, will better equip the school teachers in teaching Statistics and/or discussing topics involving Statistics.

THE UNIVERSITY OF THE PHILIPPINES' EXTENSION AGENDA

The Extension Agenda of the School of Statistics supporting the goal of the University of the Philippines to achieve excellence in social and public service is as follows: *Public service through dissemination of statistical knowledge through capability building, contribution of statistical expertise through membership in technical committees related to statistics, and provision of statistical consultancy services, that benefits the University of the Philippines and the public sector.* This project of training public school teachers is classified under Capacity Building on Statistics, the first goal listed under the Extension Goals of the School of Statistics for 2017. This project is also consistent with the School's commitment to contribute in promoting statistical literacy to various sectors of the society and in the community.

While the long-term goal of the proponent is to serve as many public school teachers as possible in areas outside of Metro Manila, for this specific project proposal, only one school will be targeted as pilot because training materials will still have to be developed. This particular school was also chosen because of its location, that is, expenses in accommodation and transportation are minimized.

The objectives for this specific project are

- to develop materials for the training on Statistics for K to 12 teachers including topics not covered in the core subject Statistics and Probability in the K to 12 curriculum;
- to better equip teachers in teaching Statistics and/or integrating topics in Statistics in other subjects;
- to capacitate and encourage teachers to use statistical techniques in their own researches; and
- to introduce the teachers on how to use MS Excel® as a tool for data analysis.

PILOT SCHOOL

The first public school targeted is Daan Sarile Integrated School in Cabanatuan City, Nueva Ecija. All teachers of Daan Sarile Integrated School were asked by the school principal to participate, regardless of the subjects and grade levels they teach; the training participants will not be limited to Mathematics or Statistics teachers only. The objective of the project is to capacitate all teachers in this school, regardless of the subjects they teach. It is the intention of the training to make teachers realize that Statistics can be integrated in practically all of the subjects they teach and that having a better appreciation and understanding of Statistics may enrich the discussions in their respective classes. They can also use their understanding of Statistics to better prepare the students for the research course that they will be taking up in senior high school.

The school principal likewise requested that the training be conducted to help them use Statistics to better perform their regular tasks such as reporting and data analysis of test results, evaluation and measurements, and some other related matters to assess the performance of their learners.

Currently, the Daan Sarile Integrated School offers kindergarten to grade 10 only, but there are plans to have them teach grades 11 and 12 in the future. The training participants will hopefully better strategize how concepts not covered in the Statistics and Probability core subject in the K to 12 curriculum may be taught and integrated in the subjects from grades 1 to 10; further, when the

time comes that Daan Sarile Integrated School starts offering grades 11 and 12, there will be teachers ready to teach the Statistics and Probability core subject.

THE ROAD TO COMPLETING THIS PROJECT

The project plan involves the following:

- consultation with Daan Sarile Integrated School principal and heads for inputs to training module, workshop activities and final coverage of the training, as well as schedule of training days;
- development of training materials and workshop design;
- development of feedback mechanism;
- conduct of training and workshop activities;
- summarizing feedback generated from the participants;
- report writing.

The actual number of training days is projected to be 5-6 whole days, to be scheduled on Saturdays or other possible days within the months of December 2017 to April 2018.

THE TRAINING MODULE

The topics to be covered include the topics in an introductory Statistics course, with the inclusion of data management and data analysis in MS Excel®. These topics are:

- Introduction to Statistics
- Methods of Collecting of Data
- Sampling and Sampling Techniques
- Presentation of Data
- Organization of Data
- Measures of Central Tendency
- Measures of Location
- Measures of Dispersion
- Measures of Skewness and Kurtosis
- Short Introduction to Probability
- Sampling Distributions
- Estimation for a Single Sample
- Estimation for Two Samples
- Tests of Hypotheses for a Single Sample
- Tests of Hypotheses for Two Samples
- Chi-square Test
- Correlation Analysis, and
- Linear Regression Analysis, with use of MS Excel®.

As of March 10, 2018, the training materials are 80% complete, with adjustments and modifications still being made depending on how the teachers respond in each training session.

THE TRAINING SESSIONS

The first session was conducted on December 18, 2017, and three additional sessions were completed on February 10 and 24 and March 10, 2018. The conduct of the first day of training was attended by 27 teachers and 3 interns.

One major result, so far, is gaining the trust and interest of some of the teachers and having them evaluate the learning materials that they are using. During sessions, majority were engaged with the lectures and discussions, and some of them participate actively. By the fourth session, attendance of teachers is no longer complete due mostly to personal reasons. The interns are also no longer attending the sessions as they have probably already completed the required number of hours to perform their tasks in the school.

Most teachers got excited during the third session when the lectures included the use of MS Excel® in data management and organization. The topics include table formats, conditional formatting, filtering, pivot tables, and data validation, among others. The use of mail merge in MS

Word® was likewise introduced to them. These topics, according to the teachers, will be very useful to them.

The use of data analysis in MS Excel® was introduced during the fourth session. So far, only the descriptive statistics tool was discussed. The teachers were also taught how to use statistical formulas and how to interpret their values.

Some Challenges

One of the challenges in this project is scheduling of training days. The consultation with the principal was made on September 2017, instead of August 2017, because of the conflict in the author's class schedule and the principal's activities/meetings for the Daan Sarile Integrated School that she needed to attend.

Training schedules were also changed in a few instances because of the activities the Daan Sarile Integrated School is involved in (e.g., one-week workshops conducted by DepEd for all teachers, inter-school competitions, athletic meets, city celebrations, etc.) and personal emergency. Saturdays are not necessarily the best days for them since some of the teachers are also taking up graduate studies. Likewise, trainings on weekdays have to be compensated by holding classes on Saturdays, and hence, must be approved first by certain officials.

Another challenge is the fact that not all teachers have laptops. About 2-3 teachers will share one laptop during sessions. There were also some teachers who seem uninterested during hands-on sessions. Is it because they are no longer interested in learning new things? Or is it because they do not own a laptop anyway?

The bigger challenge, however, is to have all of them attend the remaining sessions.

Lessons

One of the main lessons from this pilot is providing a longer period for coordination and scheduling of training and workshop activities. There is also a need to examine the learning materials used by the teachers and make suggestions on how to connect the topics in grades 1 to 10 with what the students will be exposed to in senior high school. During the first session, for example, no one in the group can explain clearly what activities or concepts are related to *data collection* at the K level although it is part of the expected skills to be developed at this level.

WHAT LIES AHEAD

There are still sessions to be conducted and workshops to be made for participants from Daan Sarile Integrated School. A tool for generating feedback from the participants is still to be developed. Hopefully though, this project can be replicated in more public schools outside of Metro Manila, and more Statistics teachers in the tertiary level would get involved in this activity.

There are two principals from other schools who expressed interest in having the same training conducted for their teachers. The author is yet to meet with any of them. The immediate goal as of now is to complete the pilot project and assess whether or not the training objectives have been achieved. It is also important to assess where and how improvements can be done before the same activity is conducted in another school.

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