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The teachers' tool

Training future public health practitioners in Kyoto

The School of Public Health at Kyoto University has fully adopted JMP® software for lectures and laboratory courses in its Department of Biostatistics. As the school aims to train public health practitioners, the usability and accessibility of JMP facilitates learning by students with various educational backgrounds.

Image of laboratory training in the afternoon Medical Statistics class. The students – with various levels of statistics skills – are problem-solving and teaching their peers in groups of four or five students.

Helping students embrace the wonder and fascination of statistics

The School of Public Health (SPH) within Kyoto University's Graduate School of Medicine was established in 2000 as Japan's first graduate school focused on professional education. The school's mission is to develop multifaceted professionals who will pursue a career in public health.

One of the most notable characteristics of a professional graduate school is that candidates must pass an oral thesis defense in order to receive a professional degree in public health (Master of Public Health: MPH). An oral thesis has a different level of arduousness than a written thesis, and the level of the content tends to be quite advanced.

Since adult learners are accepted for admission, the program enrolls doctors, nurses, physiotherapists, and pharmaceutical company researchers. The ratio of adults and recent college graduates is about 50-50.

Each cohort per year at SPH consists of some 35 students. For them, biostatistics is compulsory. In addition to those students, some 35 students from the Graduate School of Medicine are enrolled in the class. Because the educational background of the students varies, some haven't previously studied statistics. The goal is to teach statistical concepts and to help them acquire the capability to draw up a research plan in their own field.

Professor Tosiya Sato from SPH explains the challenge: "For instance, let's think about dividing a group of 100 people into two groups randomly. In practice, you will likely end up with unequal numbers, but beginners are under the impression that there will be two equal groups of 50 people. In order for those beginners to acquire the right mindset, we begin by helping the students embrace the wonder and fascination of statistics, using realistic data."

In the area of public health, the concept of "confounding" is very important. When a new treatment or medicine is in trials, the possibility for a new treatment to perform more poorly than the previous one increases if the new treatment

is only applied to patients with severe disease status. A well-designed, balanced experiment addressing relevant factors can provide a meaningful result.

Using JMP® Pro on their own PCs

The Biostatistics course consists of both a theoretical component – a lecture delivered in the morning – and practical laboratory training in the afternoon. During the afternoon laboratory session, the students practice the concepts introduced in the morning lecture. For the first few weeks of the course, students use the bulk of their lab time to grasp statistical concepts and to become familiar with JMP. After the introductory lectures, the class eventually settles into a consistent pattern.

For the first semester, Professor Sato teaches the students basic biostatistics concepts at their own pace and has them practice statistical calculations using JMP. Within the laboratory training class, the students are assigned to groups of four or five people, with an emphasis on maximizing the diversity of career experiences within each group. Also, by deliberately placing advanced and less-advanced statistics students in the same group, the department aims to foster an environment where students teach each other. In the second semester, Associate Professor Takashi Sozu's lectures and laboratory training increase the students' skill level to the point that they can solve statistical problems.

"Based on what they learned in the first semester, the students who were beginners in statistics are minimally expected to understand regression models and to analyze data using JMP. They should also fully understand the concept of confounding at this point," says Associate Professor Sozu. In lab training, the students work on analysis using

CHALLENGE

To train future public health practitioners with varying educational backgrounds in the statistical concepts they will need to execute a research plan in the field.

SOLUTION

Students use JMP® Pro software in a biostatistics course to learn how to find meaningful results in public health data.

RESULTS

The usability of JMP is well suited to statistics education. Whether beginner or advanced, students learn and embrace statistics quickly.

School of Public Health, Graduate School of Medicine, Kyoto University

"The students embrace the wonder and fascination of statistics, using realistic data."

Professor Tosiya Sato

publicly available medical data. To ensure they understand the necessity of cleaning data, the data is used as it is published – raw.

The usability of JMP® is best suited for statistics education

"JMP is most suitable as a gateway to statistics because users can complete advanced analysis tasks; JMP is as easy to use as spreadsheet software," says Professor Sato. "Statistical software that requires coding is very difficult for beginners to use. Even with my experience, I typically use JMP for most of my research except for the specific analysis that only SAS® can do.

"Both SAS and JMP are powerful analysis software tools, and it is always important to use the appropriate tool for the analysis task at hand," says Associate Professor Sozu. He says he always uses SAS for his research, adding, "There are many graphs that are easier to create in JMP, and I appreciate that they can be made visually attractive. For example, in JMP, it is simple to create a multivariate scattergram matrix and a correlation coefficient matrix. Also, I use JMP to share and explain my analysis results to research partners."

There are software packages on the market that require the purchase of additional licenses to perform more advanced analysis tasks. One of the key benefits of JMP is that you can access all of the analysis tool's functionality within the terms of an educational site license. They use scripts from the free script library to add special calculation functions to JMP. This makes JMP more usable in various fields.

The students who have used other statistical analysis packages say that the JMP user interface and navigation are easy to get accustomed to, with a quick ramp-up time. Often, many beginners have stated that the curve for learning JMP could be represented by a step-wise function rather than a gradual, smooth curve. At some point, students suddenly jump up : They simply "just get it" and realize that they have become proficient at using JMP.

This story was written in October 2014.

"Shimarisu" (chipmunk) is the mascot of Kyoto University's Department of Biostatistics in the School of Public Health. Shimarisu appears in a book written by Professor Tosiya Sato. In this series, Shimarisu learns medical statistics with readers.

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