

Background and Motivation

Given the paramount significance of data analysis in all evidence-based studies, empowering students with both the statistical theories and their applications is undoubtedly crucial. An interactive course is therefore developed in form of a flipped classroom, where the back-and-forth conceptual understandings and practices of statistical analysis skills are facilitated through easily accessible course material and free statistical software.

The Flipped Classroom Approach

Based on self-paced online videos and the widely-used Statistical Analysis System (SAS) software, which is freely available to every student, the Flipped Classroom of SAS Programming on Statistical Analysis in Public Health consists of seven micro-modules about statistical methodologies. The micro-module first describes the concepts, uses and syntax of each statistical theory, and is followed by the respective programming demonstration as a practical example on the SAS usage. The videos for each micro-module and the datasets used in the demonstrations have been made available on the flipped classroom's central webpage (<http://micromodule16.comuf.com/Index.html>).

Structure of Online Video

Each online video is structured as follows: 1) statistical concepts are first introduced; 2) their applications in SAS are illustrated through presentation slides describing the methodological background; 3) practical programming demonstrations on the SAS software interface. The videos are sound-illustrated and recorded by screen-capturing software, after which color-coded annotations are added to explain the motivation, structure and syntax of each program statement. Last but not least, data interpretations on the software are made for the clear delivery of SAS programming procedures and their statistical meanings.

Once complete, the videos are uploaded to a micro-module webpage, which has specifically been set-up as a central hub with all seven micro-modules and their related material instantly available to the students of relevant need of the analysis skills.

A short video introducing the micro-module development is available at:

<https://youtu.be/5TT83PK0kZ8>