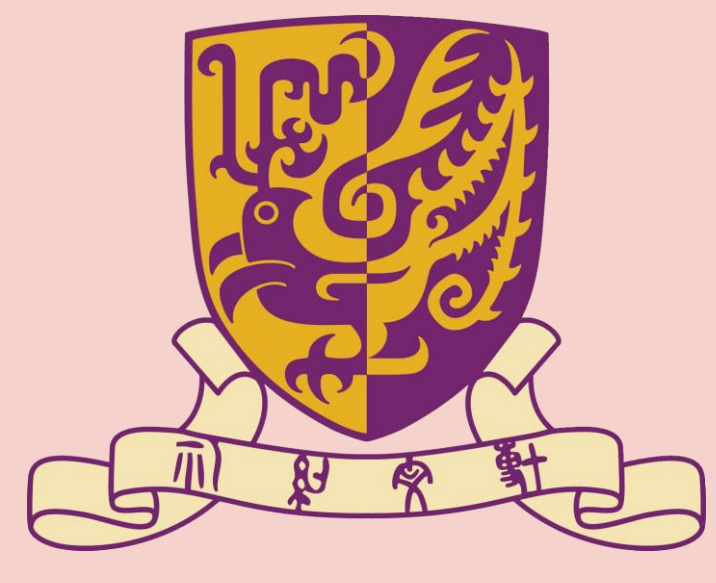


# A Self-learning Platform of Statistical Programming for Public Health Students Learning Outside Classroom



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Please visit <http://micromodule17.comuf.com/>



## Abstract

### Background

A number of the courses in Public Health is spent on teaching the basic theory supplemented with several tutorials, and there is a lack of demonstrations and discussions on applying statistical tools in healthcare science evaluations. Our teaching team has recently developed a self-learning platform of statistical programming for public health students

### The Platform

The platform includes teachings for two major programs: Statistical Analysis System (SAS) software and Vensim which are freely available to every students. Each of the flipped classrooms consists of five to seven micro-modules. The micro-module first describes the concepts, uses as well as the syntax of each statistical theory. This is followed by the respective programming demonstration as a practical application on the software.

### Contents

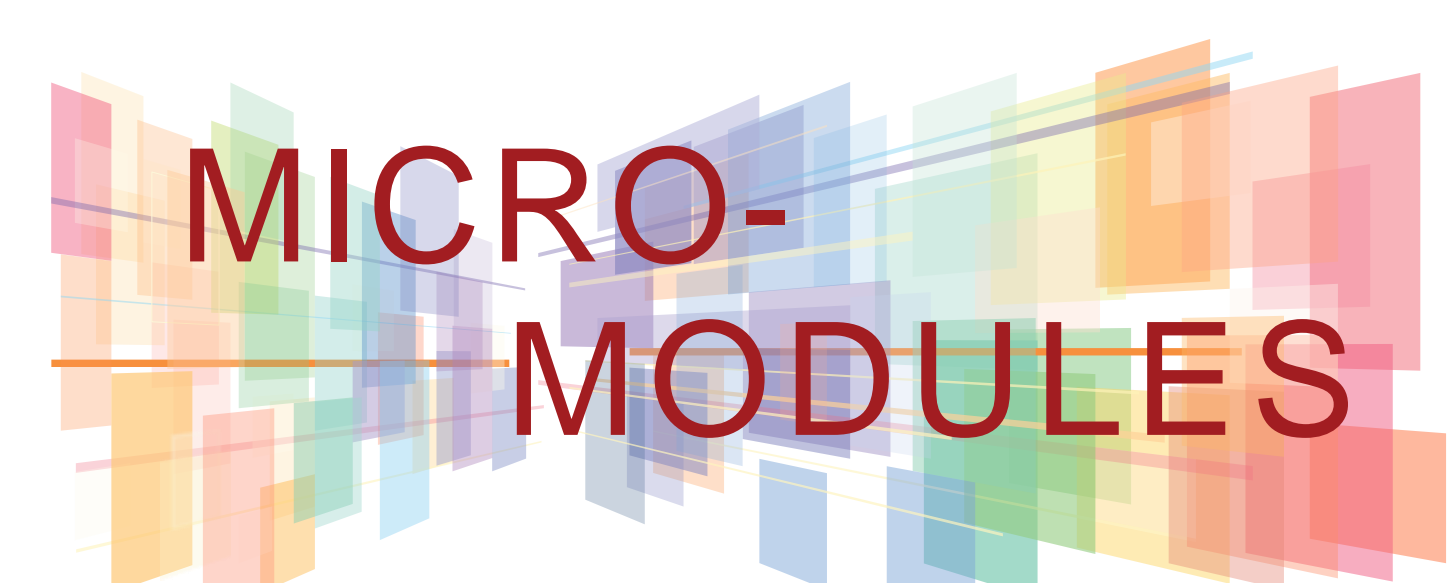
Each online video is structured as follows:

- 1) statistical concepts are first introduced;
- 2) program applications are explained through presentation slides;
- 3) practical programming demonstrations on the software interface.

The presentation slides and demonstration 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. There are also data interpretations on results generated by the software.

## Acknowledgements

This courseware is supported by the Micro-Module Courseware Development Grant Schemes (MMCDGS) with generous assistance from the Centre for eLearning Innovation and Technology (ELITE) for the recording services.



## Motivation

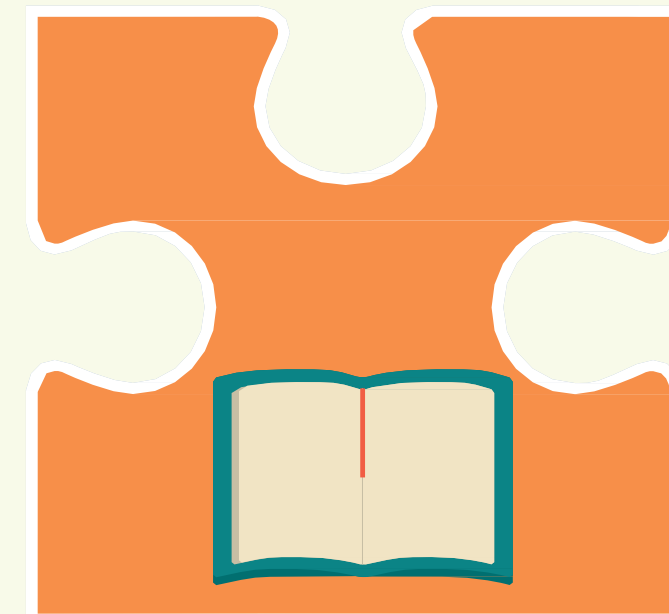
### Format and Platform

In-class teaching lacks demonstrations and discussions on applying statistical tools in healthcare science evaluations

### Content

Students are hard to apply the acquired knowledge to their practical needs.

In-class learning



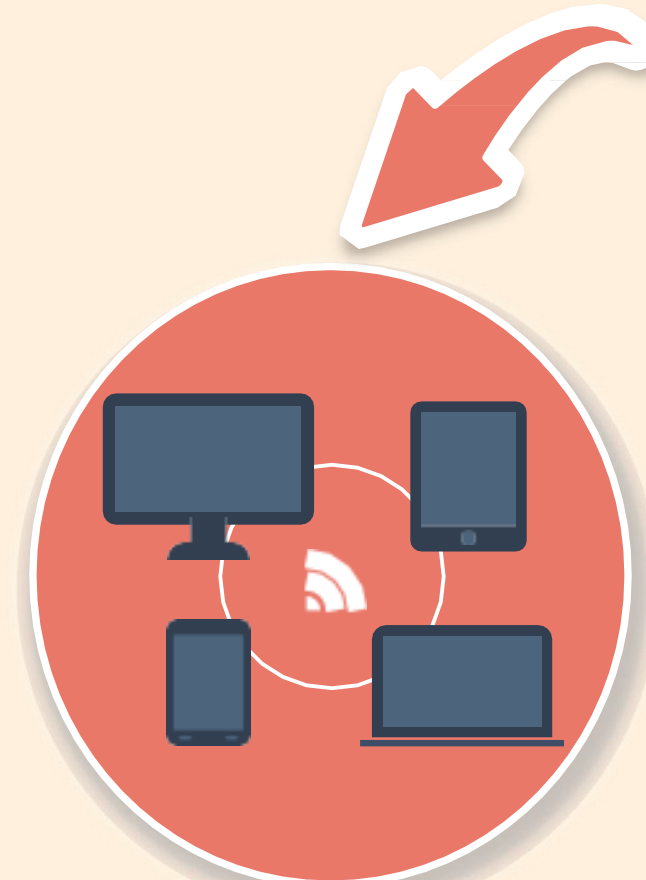
Problem solving



Conceptual Framework Practical Application



## A Flipped Classroom Approach

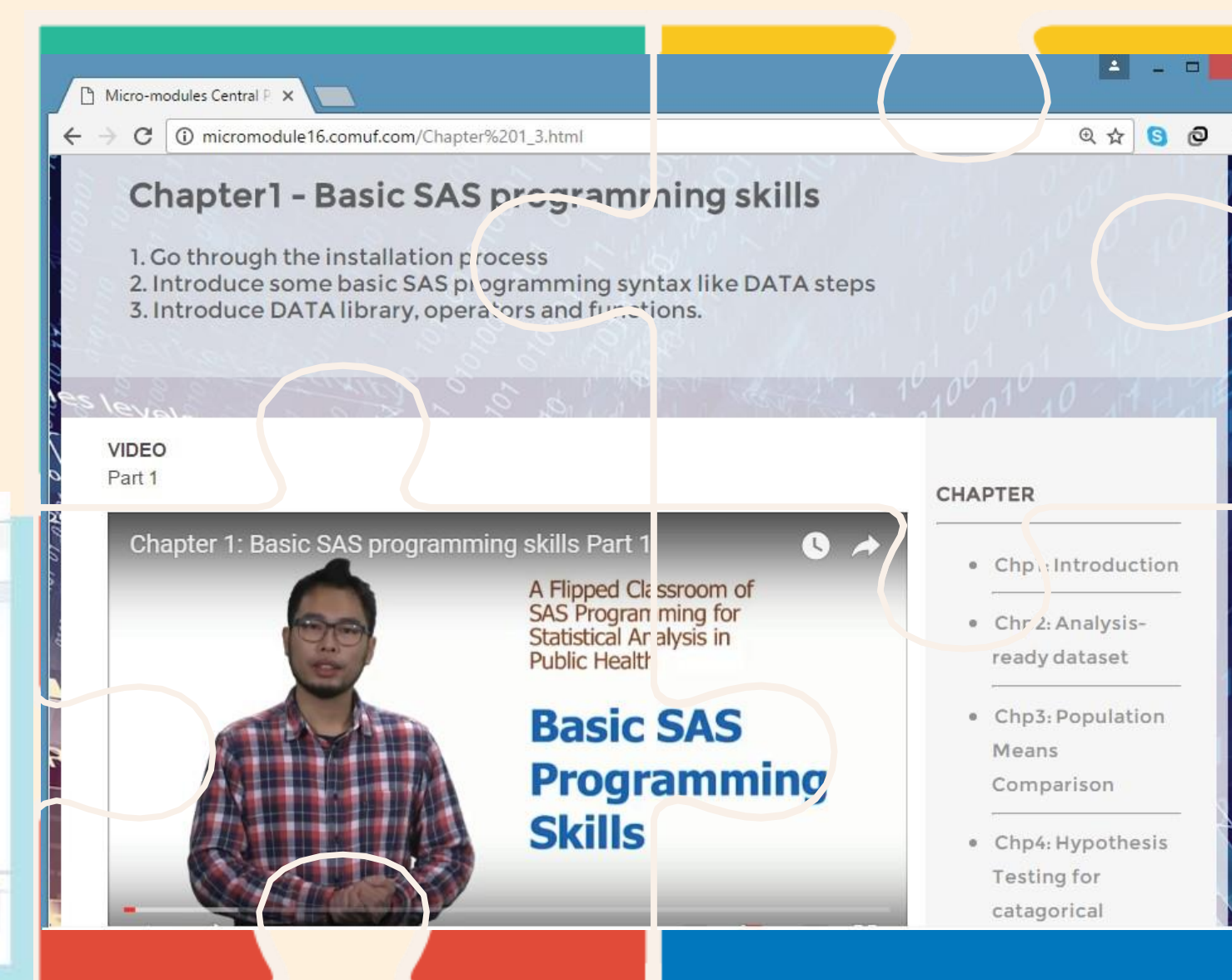
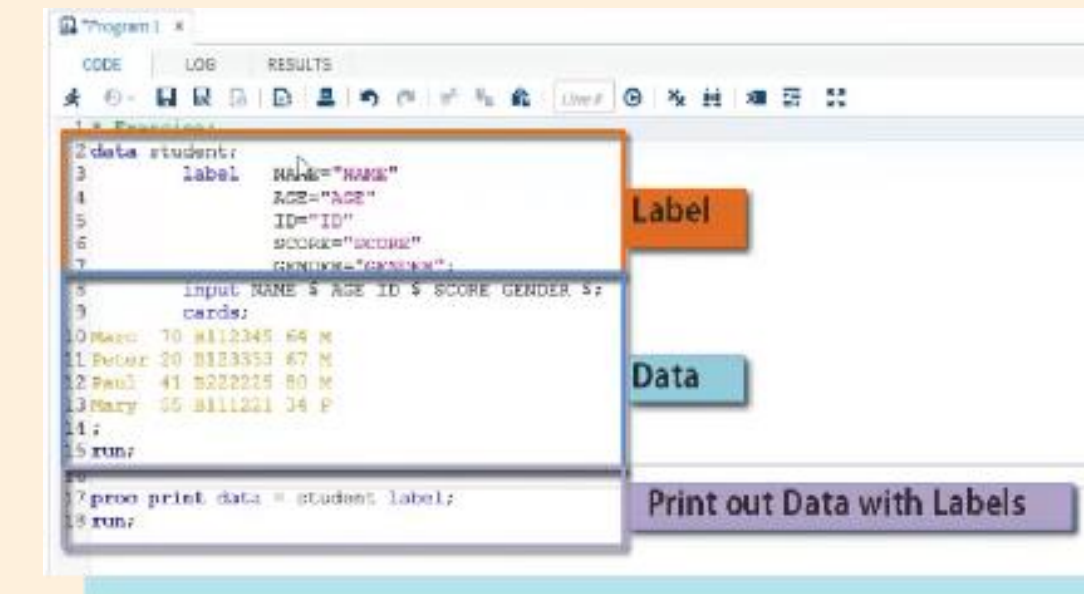


Complementary to courses (e.g. BIOS5001), an online courseware is developed to facilitate the back-and-forth understandings and practices of conceptual frameworks and software applications



(1) Linkage between classroom learning and hand-on practice

(2) Full Accessibility with no installation needed



Composition of SAS Programs

- 1. Beginning: Create a SAS data set
- 2. Middle: Work with data using SAS procedures (PROCS)
- 3. End: RUN the program



(3) Free statistical analysis softwares: SAS and Vensim

## Key Framework

### (1) Web-based Platform

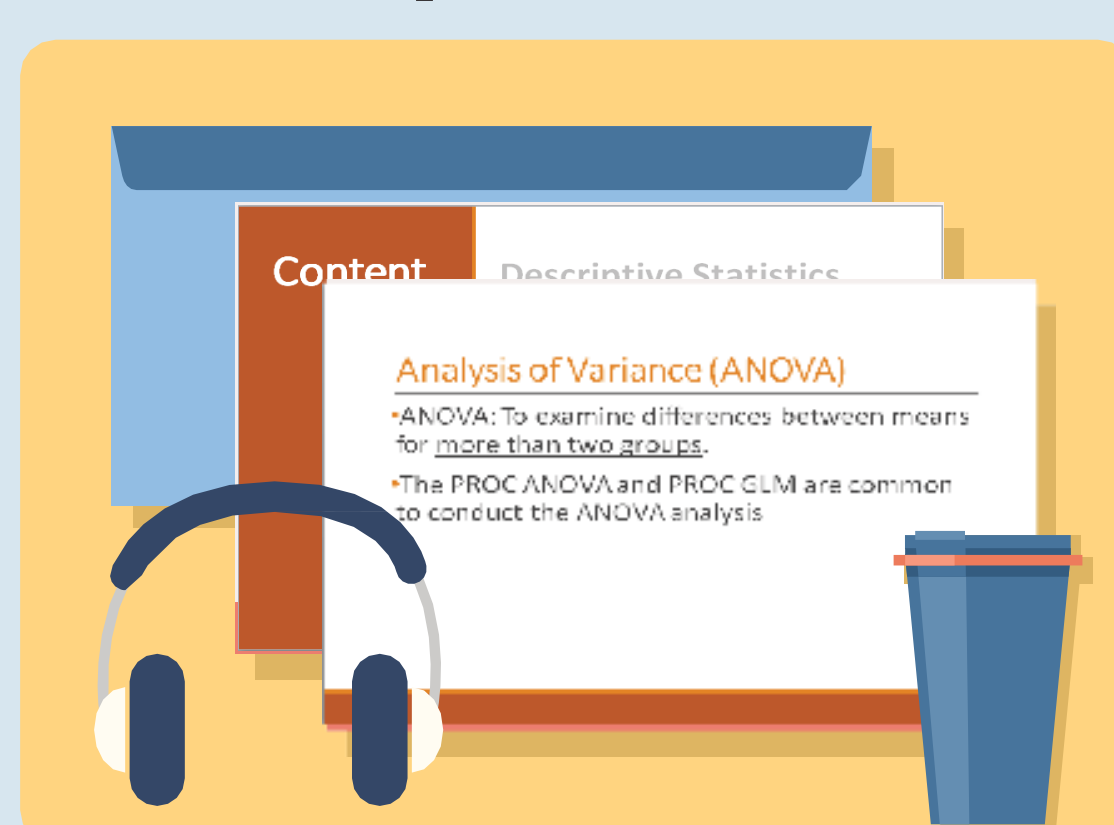
Central hub for micro-modules material

### (2) Online videos

Enabling conceptual understanding and applications of statistical methodologies

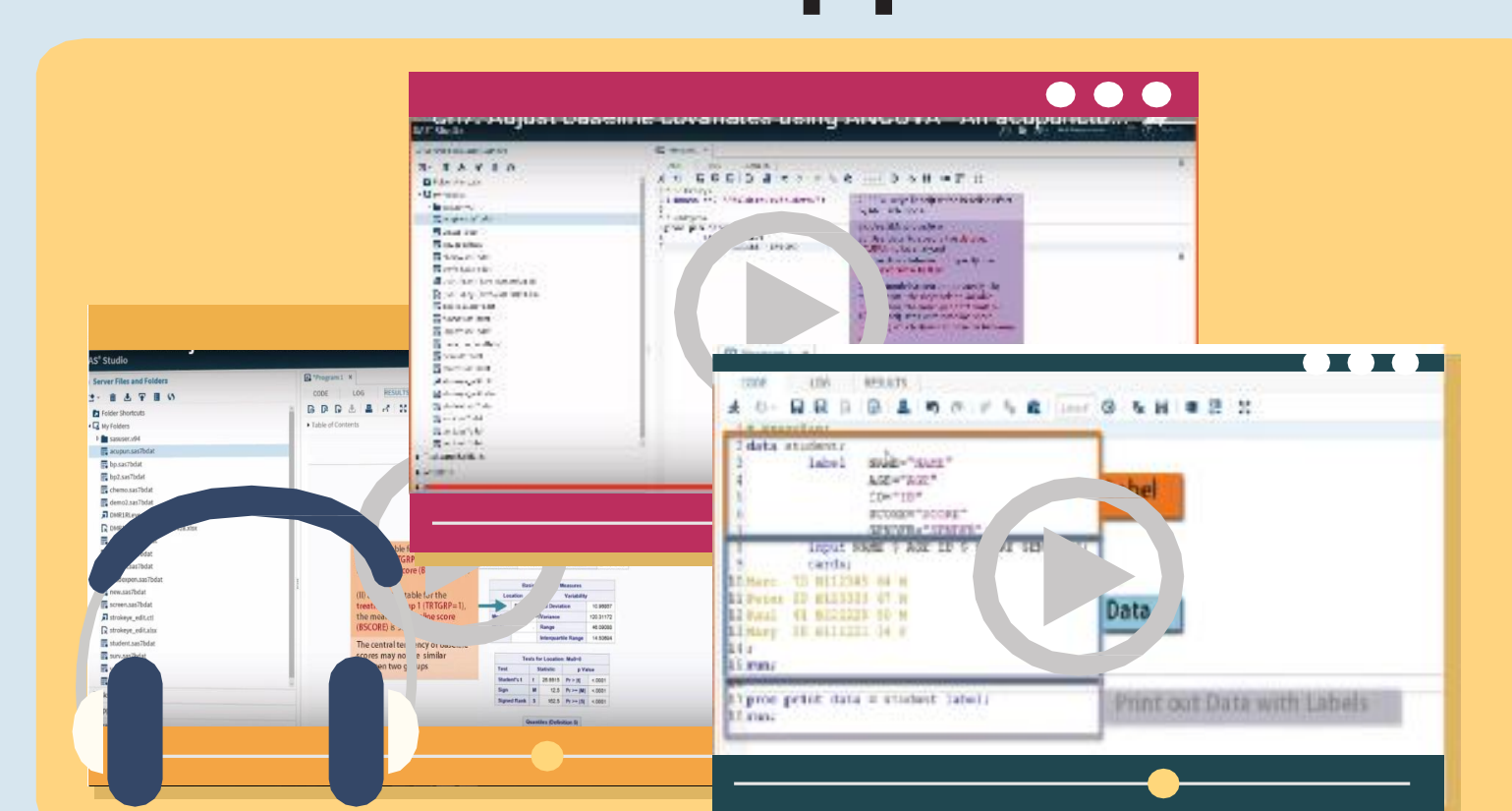


### Conceptual Framework



(I) Screen-recording of audio-aided presentation slides for conceptual frameworks of  
(1) fundamental background,  
(2) usages and  
(3) syntax

### Practical Application



(II) Screen-recording of the SAS window for  
(1) step-by-step programming demonstrations on applications  
(2) Result interpretations;  
all combined with color-coded annotations

### (3) Dataset for self-practice

Datasets used in the programming applications are also available for self-practice with demonstrations in the video



## Objective



(I) Develop a generic self-learning tool for other courses



(II) Equip students with new skills for job-seeking after graduation



(III) Teach students using the free softwares at home



(IV) Allow more time and flexibility for practice

## Evaluation

Overall, students indicated the contents are easy to understand, with a clear layout. They can understand statistical concepts and how to apply the skills using the software. Yet weaknesses include some diagrams being too vague and some examples being difficult.

Shorter durations



## Expectation

It is expected that students can learn the materials outside classroom and leave more time for in-class discussions, thus to bridge the gap between disciplines of statistics and public health practice.