**[Marc Bourdeau](mailto:Louis.Marc.Bourdeau@Gmail.com), Professor Emeritus,**

**Dept. of Applied Mathematics and Industrial Engineering**

**École Polytechnique de Montréal**

**C.P. 6079-Centre-ville, Montréal Qc, Canada H3C-3A7**

**Proposal for an e-COTS session**

**Title.** Developing a flipped pedagogy for Engineering Statistics, 15 years before its “invention”

**Abstract**. We had to acknowledge that our only compulsory course of Statistical Methods for our undergraduate Engineering students had no impact. We changed our whole approach to mimic as closely as possible the situation of the *practicing Statistician in the workplace*. That was 15 years ago. We were a precursor (or re-inventor) of flipped pedagogy.

Based on the triad “Reading, Meeting, Writing”, we introduced active learning, with real data from the industry, and report writing for case studies that included a good part of the theory. We completed over the years our own fully hyper-referenced textbook, including our own interactive animations and simulations for all the basic concepts up to regression modeling. A website was used to link the class horizontally and vertically. Most of the students’ work, partly in class, was done in small groups, with much less formal teaching, the professor shifting his role from sage on the stage to guide on the side. We introduced a novel protocol for the continuous evaluation of the course by the students. It played a crucial role in building the students’ positive attitude towards Statistics.

The new pedagogy generated a lot of enthusiasm among the students and the professors involved! The level of the course greatly improved. Success rates came close to 100%. Our work was awarded a *PrixPoly1873 for pedagogical efficiency*.

After a brief description of the final stage of our pedagogy, we will present some of our interactive animations and simulations that greatly improve the understanding of the basic concepts, and provide examples of the case studies that constitute the basic units of the students’ work.

We will also briefly discuss the advantages and drawbacks of this approach for the students and the professors, with a perspective on the information revolution that transforms university teaching. We will refer the interested listeners to a website, including a forum of discussion, with complete details of our talk, the animations and simulations, and some description of the pedagogy’s evolution that took 4 terms up to its final form, and what remains to be accomplished.

**Key words.** Flipped pedagogy, Project based Pedagogy, Case studies, Engineering Statistics.

|  |  |
| --- | --- |
| Website: [Wikistat.ca/flipped teaching](http://wikistat.mgi.polymtl.ca/tiki-index.php?page=Flipped+Teaching) |  |