MOTIVATION

THE OPEN SOURCE SHIFT

Computer science is now considered as the basis of the future economy [1]. It is then important to adapt courses given to future engineers to this reality. All Canadian engineers now require a solid basis in computer science and they especially need to be aware of and able to use computer tools specific to their domain. Consequently, the Department of Chemical Engineering of the Université de Sherbrooke switched from Matlab teaching to Python with the Spyder programming interface in 2016. This latter high-level programming language is indeed free and open-source and, particularly, its use is constantly increasing in both research and industrial fields [2].

THE NEW COURSE

FLIPPED CLASSROOM

From this switch, the teaching method was also thoroughly revised. Courses are now given in video format accessible via Catalyseur.ca. All course periods are now dedicated to individual help to the students. This course format was particularly appreciated by students with learning difficulties who can watch or pause the courses any number of times. This first-semester course then provides a strong basis for the 7 following semesters to all students. Considering their high level of knowledge in computer science, problems to solve in other courses can now be complexified by solving them with computer tools.

THE WEB PLATFORM

USER-FRIENDLY INTERFACE

The teachers can upload courses to Catalyseur.ca in different formats: text, presentation, audio, video, Jupyter Notebook. A text editor is also embedded in the platform to allow the teacher to write exercises. All created exercises and courses can thereafter be accessed by any other teacher via Catalyseur.ca. Our web platform then creates a database of learning contents continuously updated by the users.

MONITORING TOOLS

The teacher can follow the progress of the students in their courses. From data created by student’s activity in Catalyseur.ca, the teacher can easily know which subjects and exercises are less understood.

TEACHER SIDE

VECTOR, MATRICES AND OPERATIONS

EXAMPLE 3

STUDENT SIDE

> 250 exercises
> 100 videos

MODERN WEB-DESIGN

The students access the proposed courses and exercises via a simple to use interface. Graphics and statistics depicting the progress and completion are automatically generated for each student.

PYTHON FEATURES

A Python3 code editor linked to a Python server is embedded to Catalyseur.ca. The students can then complete the exercises directly in the web platform. The students can also ask a question for a specified exercise via forums supervised by the teacher.

[1] MAISONNEuve Vincent, Pénurie d'informaticiens et pas seulement en informatique, Radio-Canada.ca, 23 nov. 2017