Case Study

Stronger Together

How two edX partners teamed up to offer a new Professional Certificate in C Programming with Linux

Executive Summary

The C Programming with Linux Professional Certificate, jointly developed by Dartmouth and IMT, establishes a new partnership, to provide novel and interactive learning tools to anyone interested in gaining an extensive foundation in C programming and Linux OS. This series of seven short courses features a new way of learning how to code, taking advantage of tools already built by IMT and France ioi. Dartmouth and IMT committed to a truly collaborative development process which kept the teams motivated to build this ambitious program.

Challenge

The challenge was both at an institutional level and at a faculty level. At the institutional level, we had to bring together two higher-ed cultures from both sides of the Atlantic: Dartmouth from the Ivy League in the USA, and IMT from the Grandes Écoles in France, as well as facilitate the work required from our respective faculty to put this program together. The lead-faculty already had common grounds in their respective teaching experience and research topics. The challenge was to organise ourselves to work together remotely for a whole year, also taking into account the time difference.

Approach

We first decided on a split of roles at the institutional-level: IMT would take the lead on tools development and upgrade, having originally developed these to be used in 2 MOOCs on the Open-edX French platform; Dartmouth would lead the Program implementation on the edX platform, having already launched multiple courses and several professional certificates. We conducted a project team kick-off in Boston in September 2017, including our respective Partner Managers and Project Coordinators at edX who were actively helping us with any technical issues as they arose during the life of the project.

Our respective faculty members both had experience building and offering MOOCs which helped them anticipate the workload and process of designing and producing MOOCs. They also had solid common ground in their respective teaching experience and research topics, removing barriers for beginning programmers through innovative teaching tools.

Working closely together on the design of the Professional Certificate, from a distance, was another challenge. Both faculty agreed that the best solution would be to schedule two MOOC “residencies”, when they would both be in the same place and could concentrate on actually producing and testing the course contents. Rémi Sharrock from IMT travelled to Hanover on 2 occasions: 10 days in November 2017 and 6 weeks in the spring of 2018. In addition to these residencies, the course teams and leaders from IMT and Dartmouth had short work sessions at the edX Global Forum, Open edX Conference, and in Paris for the announcement of the program at a live event.

> *Having produced two previous MOOCs on C Programming offered in French, I was thrilled to learn that, Petra Bonfert-Taylor at Dartmouth teaches C to her engineering students. We discovered how much we have in common and were excited to partner to bring coding to the complete beginner on edX.”*
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> — Rémi Sharrock, Associate Professor at IMT Telecom ParisTech

> *I was impressed when I discovered the tools developed by IMT and France ioi, and excited with the opportunity to use them to teach C Programing in my own classes and for a global audience. Thanks to this collaboration, we have made these tools even more powerful and simple to use for the complete beginner.”*
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> — Petra Bonfert-Taylor, Professor, Thayer School of Engineering at Dartmouth

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Outcome

- First Professional Certificate developed jointly by two edX Partners across continents
- Use of Codecast in Professional Certificate and in local courses at Dartmouth
- Provides a flexible code learning environment on edX that could be used for other programming languages
- Involves undergraduate computer science, engineering, and social science students in testing the tools, and developing learner assessments
- Both IMT and Dartmouth worked with their respective institutional leadership to fund, support, and publicize a collaborative project
- Successfully designed experiments (A/B tests) on learner engagement and retention with other edX partners

Learnings

Two edX partner institutions can work across different time zones, languages, cultures, and academic calendars to produce a rich learning experience in a jointly offered program. A key component to this success was establishing "MOOC residencies" which allowed team members to be together for short "sprint development" periods. In addition, telling the story of a collaborative development process and new teaching tools at conferences informed and inspired the work and developed new partnerships.

Additional Information

- Codecast, Taskgrader, and WebLinux are innovative learning tools that provide interactive lessons with instant feedback to learners, without needing to install anything. These tools have been developed by IMT and France ioi to aid in offering these courses.
- Demo paper presented at the Learning@Scale conference, April 2017, MIT, Cambridge
- Publication at SIGCSE, Baltimore, February 2018
- Live demo at Open edX conference, Montreal, May 2018
- Poster session Learning@Scale, London, June 2018

Media Coverage

- Dartmouth News
- Thayer Schools of Engineering news
- IMT Press Release

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