

# UP2U, THE EUROPEAN PROJECT TO CLOSE THE GAP BETWEEN SECONDARY AND HIGHER EDUCATION

A. Vieira de Castro<sup>1</sup>, P. Szegedi<sup>2</sup>, B. Tóth<sup>3</sup>, M. Grammatikou<sup>4</sup>

<sup>1</sup> Polytechnic of Porto (PORTUGAL)

<sup>2</sup> GÉANT Association (EUROPE)

<sup>3</sup> KIFU (HUNGARY)

<sup>4</sup> National Technical University of Athens (GREECE)

## Abstract

The main objective of the Up2U project is to close a gap between secondary and higher education. We intent to innovate and explore solutions to integrate formal and informal learning scenarios and adapt the emerging technologies with teaching and learning methodologies that secondary students will face with once they enter universities. We are focusing on the context of secondary education and the schools that support it, often defined as "secondary schools", which involves students between the ages of 11 and 19, depending on the country, after primary education and before higher education. The learning context from the students' perspective is an intersection of formal and informal spaces with a dynamic hybrid learning environment where activities are synchronized between virtual and real dimensions.

We propose to develop an innovative the ecosystem called "Up to University" (Up2U) - based on proven technology-based experiences from higher education and grounded in large research - to facilitate co-design, co-creation and reuse of digital educational content, technological tools and services. We are adapting tools to the context of secondary schools in the pilot countries anticipating what student will find at universities in order to better prepare them to that level of education.

We will address project-based learning and end-to-end learning scenarios. We firmly believe that all the tools and services that Up2U will use and/or make available (i.e., incorporate, design, develop, and test) are sustainable after a project lifetime. Therefore, the project will include business plans and investigate appropriate models using the experience of small and medium business partners and the National Research and Education Networks (NRENs) and their contacts with third-party actors. Our plan is to make possible that secondary schools join the Up2U consortium infrastructure and use this federated ecosystem for that learning community with the least disruption.

Keywords: Up2U, Education, Technology, Open Education, Learning Analytics, Digital Skills, OER.

## 1 THE UP2U ECOSYSTEM

It's important to understand and describe the problem space first. We have been using data from OECD (Organization for Economic Co-operation and Development), EC (European Commission) and national Education Ministries as well as specific studies of previous European projects to get the bigger picture. We are consulting experts within and outside of our project, surveying our potential stakeholders; school directors, teachers and students to get the necessary insight. Demographic trends show that some European countries that lack natural population growth due to low birthrates and at the same time are major senders of immigrants to other countries (typically the Central and Eastern European countries) face the severe risk of contraction of higher education institutions, stagnation within the education market as well as the labor market, and thus a decline in economic growth [1]. Schools are doing their best to send more and more students in higher education – often above 80% of graduates – but students are more likely drop-out in first year.

Investigating the reasons why students drop out early from university we identified two major aspects, a) new technology that they suddenly have to use and b) different teaching/learning style that they have to adapt. More freedom in taking individual learning path and more tools and information sources available to choose from the larger the chance that students will be lost in their studies and cannot objectively control their learning progress. University is often presented to them and perceived by them as an end-goal but once they are in they are not ready for it. Fixing situations at university is way more difficult and often too late than addressing the issues early on, while they are still in secondary education.

Up2U is addressing the technology and methodology gap between secondary schools and higher education by adopting tools and developing the necessary skills for students to seamlessly transfer into universities. We put the teachers in the centre of our actions. We believe that the teachers should be empowered and trained to use new technology that support them to try novel pedagogical methods. Studies show that soft skills for students such as critical thinking, social awareness, emotional responsiveness, independence and so on are equally important to adopt to the higher educational challenges. Teachers should be able to develop these skills in their students using an easy-to-use environment that sets the entry bar very low, minimize the extra efforts, and also minimize the disruption to standard techniques.

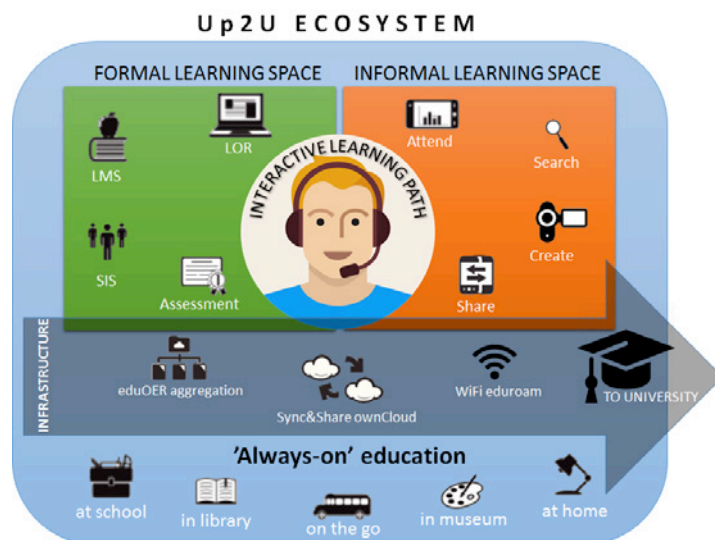


Figure 1. The Up2U ecosystem

The Up2U ecosystem is in the cross-section of formal and informal learning spaces. The "Opening Up Education" policy of the European Commission [2] stated that about 63% of nine year olds in the EU are in schools that are still not digitally equipped although 90% of jobs will require digital skills by 2020. On the other hand, the The "Net Children Go Mobile" project study [3] measured that about 84% of the 15-19 years old students can access the Internet in their own bedroom, presumably from their own mobile devices. This constitutes a large portion of digitally equipped but not digitally educated student population in Europe. Up2U is targeting them.

## 2 LONG TERM OBJECTIVES

We strongly believe that all the tools and services the project is going to use and/or make available (i.e. incorporate, design, develop and test) must be sustainable after the lifetime of the project. Therefore, the project is going to develop business plans and investigate appropriate business models using the expertise of the Small Medium Enterprise and National Research and Education Network partners and their contacts with third-party business actors.

Our plan is to make it easy for new schools to join the Up2U infrastructure and ecosystem that will form a federated market-place for the learning community. The main objectives of the project are:

- To assess the use of public and private cloud-based infrastructure services with proven track records in higher education and research, integrating and adapting them to the specific learning context of schools.
- To design and develop a scalable and flexible integrated "application toolbox", which supports student-driven, personalised, dynamic learning path creation with social sharing and interactions (i.e. project-based and peer-to-peer learning and assessment) on top of the aforementioned cloud-based service infrastructure.
- To build and train the learning community for the specific learning context and to facilitate the development of the critical thinking by students and tutoring role of teachers that are essential in an informal learning environment.

- To propose an executable roadmap for ensuring security and privacy. Specifically, the project will address filtering of network traffic at schools, handling of intellectual property rights, copyright materials, student identity, and the right to choose data storage locations.
- To roll out and test the infrastructure service components and the application toolbox through very large-scale pilots in at least 7 European countries (Germany, Greece, Hungary, Italy, Lithuania, Poland and Portugal) to identify strategies for scaling and achieving bigger impacts.
- To develop, establish and operate a continuous risk assessment function during the entire lifetime of the project and to liaise with other related projects and initiatives.
- To define an effective sustainability and exploitation framework based on GÉANT's NREN community, their existing customer base, SME partners and connected schools in order to mainstream learning solutions for secondary education that are proven in higher education and research contexts.

### **3 ENGAGEMENT WORKFLOW**

The methodology that our project has chosen puts the teachers in the center. We want the innovative teachers to be our ambassadors.

Obviously, the formal engagement has to start with the schools. We have identified several pilot school in 7 European countries (Germany, Greece, Hungary, Italy, Lithuania, Poland and Portugal) who already signaled their interest in working with us. As more and more conversation is happening, the list of potential pilot schools is exponentially growing. Up2U is going to sign Memorandum of Understandings (MoUs) with the school directors/principals who then can authorize their voluntary teachers to access the Up2U platform. Authorized teachers can then create their own virtual learning environments in Up2U and invite the students. Students will only be able to join the platform and benefit from its services once they are invited by their teachers. In this way we connect the formal learning environment with a large number of informal tools that are verified and validated in the Up2U ecosystem.

Web Single-Sign-On and the state-of-the-art identity management and access federation solutions are essential parts of our system design to protect privacy and personal data. Mostly dealing with minors under 18yo in the secondary school environment, it is required by the latest data protection regulations of the EU to handle personal information with care. We'll let the schools or trusted third-party identity providers to handle user credentials and we are implementing mechanisms to get informed consent/assent from students with the necessary control by their parents and guardians as well as their school teachers before their gain access to our tools and services.

#### **3.1 The workflow**

In the very first step the teachers will be presented by various use cases. They have to decide what new pedagogical aspect or teaching methodology they want to experiment with. This could be as simple as just making sure that they keep in touch with the students after school, up to the complex scenarios where they want to experiment with flipped classes, project based or peer-to-peer learning. They can chose to improve certain skills of the students or perhaps participate in interesting international project activities (e.g., visit virtual labs, museums or research facilities of CERN) that would elevate the motivation level of the students who are otherwise inactive at class.

Once the pedagogical aspect is defined teachers will be presented with a set of formal and informal tools to support the particular methodology. The current categories of tools include: real-time communication and collaboration, file/document sharing, content exploration, recording & publishing, and social interactions. In each category various validated and verified tools will be offered to support the teachers. These tools will either be internal tools and third-party external tools integrated into one uniform learning platform. The intention is to require the minimum efforts and cause the least disruption when teachers try out something new.

The third step of the process is the verification of the impact. Enhanced data collection and learning analytics will be applied on the Up2U platform that allows the teachers to assess the results of their experiment. The results obviously can be made available in a public domain and may serve as use cases in order to give feedback to other teachers wish to try the Up2U platform. The various practices can also be adopted to other countries, languages and education systems to gain broader understanding on their overall productivity.

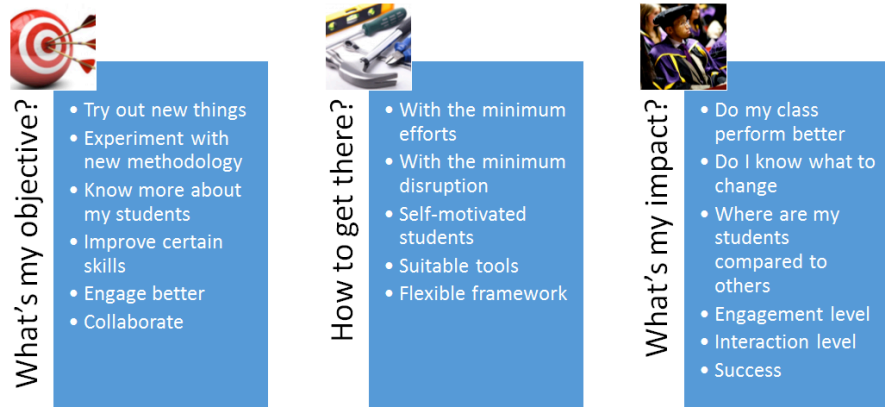


Figure 1. Simple workflow

### 3.2 The teachers' training

Despite all the simplicity and low entry barriers, we cannot expect the teachers to use our platform without basic introductory trainings and consultation opportunities.

The first step of Up2U's training plan is to analyze the needs of our trainees by conducting a short survey among the participating schools, in order to collect data regarding high school teachers' current levels of ICT competences. Data from this gap analysis will enable us to define specific needs-based objectives for the training process. These objectives will support the design and development of training materials as well as help us assess the success of the overall training plan.

Based on the gap analysis, the next steps of the training plan will focus on:

- Building the training courses, by selecting appropriate technologies and media platforms for delivering them.
- Defining the duration of each course separately.
- Creating training material, informed by cross-cutting competences in the European DigiCompEdu Framework [4]. Design of online training materials will be based on DigiComp guidelines.

Up2U training courses will also encourage teachers to become involved in the development of the Up2U toolkit and create a learning ecosystem where ideas for the project can be shared across schools and countries.

The Subject Matter Committee (SMC) acts as an oversight committee on the general training programme. In addition to permanent members, the SMC will also include national sub-committees which will have a few representatives each, who will advise the project regarding their particular schooling systems and pedagogical/teaching aspects.

Three categories of target audience are expected, according to the teachers' attitude towards the new learning methodologies:

- Constrained to changes, reluctant to trust new learning methodologies and technologies.
- Moderately motivated to use and/or experiment with the above.
- Very motivated to use and/or experiment with new learning methodologies and technologies.

### 3.3 Expected roadmap

The Up2U project was started in January 2017. We have started the development of our technology platform and the investigation of the schools/teachers' requirements at the same time, in parallel. We follow the rapid prototyping model which means that we are going to launch a minimum viable product that is sufficient to measure the most feedback with the least efforts. Based on the feedback, we are going to develop our platform to the given direction so each and every feedback cycle the product is expected to be better and better.

The first feedback cycle is expected to happen by September 2017. Our Up2U Next Generation Learning Management Platform (NG-LMP) prototype as well as the early requirements from the pilot schools on their specific needs will be ready to be correlated and further development directions defined. We wish to start testing our platform with some selected schools already started from September 2017. Afterward, every semester will give us the opportunity to improve based on the usage data and feedback.

#### **4 CONCLUSIONS**

The key objective of Up2U is to bridge the gap between secondary schools and higher education & research by better integrating formal and informal learning scenarios and adapting both the technology and the methodology that students will most likely be facing in universities.

The learning context from the perspective of the secondary school students is the intersection of formal and informal spaces, a dynamic hybrid learning environment where synchronous activities meet in both virtual and real dimensions.

For this, we propose to develop an innovative Up to University (Up2U) ecosystem – based on proven experiences in higher education and big research – that facilitates open, more effective and efficient co-design, co-creation, and use of digital content, tools and services adapted for personalised learning and teaching of high school students preparing for university. We will address project based learning and peer-to-peer learning scenarios.

#### **ACKNOWLEDGEMENTS**

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#### **REFERENCES**

- [1] Demographic Trends and Risks for European Higher Education, Fatma Mizikaci and Bernd Baumgartl, International Higher Education pp. 15-16.
- [2] COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Opening up Education: Innovative teaching and learning for all through new Technologies and Open Educational Resources /\* COM/2013/0654 final \*/
- [3] Net Children Go Mobile Final Report (with country fact sheets) – November 2014 Mascheroni, G., & Cuman, A., (2014). Deliverables D6.4 and D5.2. Milano: Educatt.
- [4] European Commission: The Digital Competence Framework, <https://ec.europa.eu/jrc/en/digcomp/digital-competence-framework>