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Author(s)

Name: Delgado Kloos, Carlos (presenter)

Position: Vice-President for Strategy and Digital Education

Organisation: Universidad Carlos III de Madrid

Country: Spain

E-mail address: cdk@it.uc3m.es

Short bio (150 words max):

Carlos Delgado Kloos has a Ph.D. degree in Computer Science from Technische Universität München (Germany) and in Telecommunications Engineering from Universidad Politécnica de Madrid (Spain). He is Full Professor of Telematics Engineering at the Universidad Carlos III de Madrid, where he is the Vice President for Strategy and Digital Education, Director of the UNESCO Chair on “Scalable Digital Education for All”, and Director of the GAST research group. He is also the Coordinator of the eMadrid research network on Educational Technology in the Region of Madrid and Senior Member of IEEE. He has carried out research stays at universities such as Harvard, MIT, Munich, and Passau. His main research interest lies in Educational Technology. He has been involved in a large number of research projects and has published around 500 articles in conferences and journals. He has coordinated and taught in several MOOCs (massive open online courses). His web page is www.it.uc3m.es/cdk.

Name: Alario-Hoyos, Carlos

Position: Deputy Vice-President for Strategy and Digital Education

Organisation: Universidad Carlos III de Madrid

Country: Spain

E-mail address: calario@it.uc3m.es

Short bio (150 words max):

Carlos Alario-Hoyos has a Ph.D. in Information and Communication Technologies and a M.S. in Telecommunication Engineering from Universidad de Valladolid (Spain), since 2012 and 2007 respectively. He is Visiting Associate Professor in the Department of Telematics Engineering, Deputy Vice President for Strategy and Digital Education at Universidad Carlos III de Madrid (Spain), and Subdirector of the UNESCO Chair on “Scalable Digital Education for All”. He has carried out research stays at prestigious universities in the UK, Australia, Chile and USA. His skills and experience include research and development in MOOCs, social networks, collaborative learning, and evaluation of learning experiences, among others. He has been

involved in the design and enactment of MOOCs deployed in edX and MiríadaX at Universidad Carlos III de Madrid. He has participated in several Erasmus+ projects related to MOOCs and learning analytics. His web page is www.it.uc3m.es/calario .

Proposal

Title: Transforming University Education: The UC3M Way

Abstract (maximum of 150 words):

The exponential change in IT forces inevitably a transformation of all industries in an unprecedented way. Teaching and learning at universities are no exception. For a millennial old institution that is very regulated, this imposes many challenges. What is the right direction to follow, when there is no right direction and the context (inside and outside) tends toward perpetuation of traditions? What is the right balance between following hype without reflection and not acknowledging the opportunities and risks that lie ahead? The technological “cheese” is being moved and each university has to find its way. In this paper, we present some of the initiatives carried out at Universidad Carlos III de Madrid in this respect. Some of the principles that have guided our strategy include awareness, experimentation, support, teaching the teachers, participation in international initiatives, sharing, incentives, and more. Our objective is to share ideas and to spark discussion.

Key words (up to five):

Digital transformation, MOOCs (massive open online courses), SPOCs (small private online courses)

Has this paper previously been published/presented elsewhere? If yes, give details.

The paper is new, although some of the underlying ideas have been previously presented elsewhere in some other form.

Text of paper (maximum of 3000 words, excluding references):

Please insert here.

Introduction

The world is changing, and at an increasingly fast speed. All industries are transforming themselves in view of the rapid advance in information technology and its impact. We are in a permanent state of surprise. To be surprised by the unexpected doesn't surprise us any more. Disruption is the new normal.

Are we at universities not acknowledging the state of the art in teaching and learning? Are we using the best available methods and techniques to teach our students and prepare them for their professional life? Does inertia and uncertainty prevent us from moving forward?

2012 was named by The New York Times as the "Year of the MOOC". It was predicted that MOOCs (massive open online courses) were going to make universities disappear. If we look back, we see that this has not happened. What is worse, to embrace MOOCs that have not lived up to their promise or to ignore them? Shall we follow the inertia that we get from outside and inside, or shall we make an effort together with the enthusiasts without knowing where we will end up? Somebody said that changing a university is like moving a graveyard, you cannot expect help from the people inside. We are in a comfortable state of minimum energy, where all the elements match. Getting out from this state means introducing more energy into the system. What can public universities do in years of economical crisis, when the funding bodies reduce budgets rather than increase them to have a better prepared workforce?

In this paper, we will present the digital education strategy followed by Universidad Carlos III de Madrid (UC3M), a young public university in Spain. We will structure this paper into the following sections:

- Assessment of the situation, awareness of external change
- Defining structures, processes, and policies
- Preparing the faculty: Training and supporting the trainers
- Using research to support decision making
- Learning with others

The objective is to spark discussion. By presenting our strategy and listening to those of others, we might all come out reinforced and better prepared for the future.

Assessment of the Situation: Awareness of External Change

As has often been said, we live in a VUCA environment: volatile, uncertain, complex, and ambiguous. Therefore, the first step is recognizing that there is the need to change and improve the parameters to educate in terms of formats and conventions. The context has changed in multiple ways: new technologies are available that open the door to new and better ways of teaching and learning; students are used to acquiring knowledge in a different way that is multimedia and more spontaneous; knowledge is available at the tip of our hands; the creation of new knowledge is speeding up immensely making existing knowledge obsolete. The rapid obsolescence but higher availability of knowledge has two important implications. One

is that there is the need to update the knowledge throughout the working life of the professional. The other one is that the mere acquisition of knowledge is not enough to perform well at work: the so-called 21st-century skills, such as collaboration, communication, creativity, and critical thinking, gain in importance.

Therefore, in the current changing educational environment, no one knows for sure the right path to follow. It is important not to stay still, but to experiment, fail, and learn from our mistakes and wrong decisions. The awareness and willingness to experiment is the first premise to advance towards a brighter educational future.

Defining Structures, Processes, and Policies

One of the first steps to face the digital transformation in educational institutions from the strategic point of view is the definition of appropriate structures and processes towards which to channel this transformation.

A specific administrative unit was created in 2011: the UTEID (Unidad de Tecnología Educativa e Innovación Docente, Educational Technology and Teaching Innovation Unit). Its goal is to support faculty with the development of innovative educational content. The unit integrates the video production studios and the personnel for production and postproduction of video content. Self-production cabins are also part of the equipment with the possibility to record handwritten content with voice. The unit also integrates software staff that takes care of the deployment and management of MOOC platforms like Open edX and also develop specific software such as the one designed to support the management of educational material. Finally, this unit also manages the production of MOOCs and SPOCs (small private online courses, or on-campus MOOCs) and provides the necessary support throughout the development process, including subtitling. This unit has been a key element for the implementation of the strategy.

UC3M has articulated some of the processes through annual calls, open to the teaching staff. In addition to existing annual calls for teaching innovation projects and the generation of open courses for OCW (OpenCourseWare), which this academic year meet 16 and 12 editions respectively, specific calls were introduced for the development of MOOCs (as a way of offering quality education from UC3M to the world) and SPOCs (as a way of implementing hybrid education approaches for UC3M students). In these annual calls, economic incentives were allocated depending on the workload expected on the teachers' side, as a form of recognition for the work done, and as a way of fostering teachers' commitment towards the implementation of a digital transformation at UC3M.

Nonetheless, the defined processes may not be sufficient without adequate institutional support for teachers. Institutions must rethink the purposes of their infrastructures and spaces, which may need to be used for purposes other than those for which they were built (e.g., to transform traditional classrooms into more flexible spaces for discussion and collaboration). UC3M has worked for years in the adaptation of spaces within some of its buildings, with emphasis in the existing libraries (and the newly built one), to offer

innovative spaces, such as a Makerspace, video production rooms, teamwork rooms, flexible classrooms, among others.

Finally, in this new and changing educational context it is necessary to define appropriate policies that support the decisions made and that help to move forward towards the objectives of the institutional strategic plan. From an educational point of view, it is important that students and teachers can make informed decisions about how to improve the way they work, the methodologies used for teaching and learning, or the adequacy of content and assessment systems. UC3M made important advances in the application of learning analytics at the institutional level, offering dashboards with meaningful visualizations, so that faculty members and students increase their awareness about the work they did, and the overall performance of the class. We must never forget that learning analytics policies must take into account the ethical aspects of data collection and processing and, of course, comply with applicable regulations.

Preparing the Faculty: Teaching and Supporting the Teachers

Once the processes and policies have been defined and the infrastructures and roles of the administrative personnel have been reconsidered, it is time to work directly with the faculty in the transformation of their teaching practices. It may be the case that teachers lack adequate digital competencies to face this transformation. The European Commission defined a Digital Competence Framework for Educators (Redecker, 2017), which can serve as a diagnosis tool to identify the main weaknesses of our teachers. The six areas, 22 competences, and six levels of acquisition per competence in this framework can help the policy makers of the institutions to detect the competences of their teachers that must be reinforced through a specific teacher training plan. From a pedagogical perspective there are four areas in the Digital Competence Framework for Educators that are particularly relevant, as these refer to the creation and sharing of digital contents, the pedagogies used for teaching (including the interaction with the learners), the assessment approaches used, and transversal aspects such as accessibility and personalization. UC3M has implemented a teacher training plan with three core axes: didactic, research, and transversal. The didactic axis includes courses designed precisely so that teachers can develop the digital skills they need to participate actively in the digital transformation taking place at the university. Courses currently available in the teacher training plan are delivered mainly as face-to-face or blended courses, although a catalogue of third-party online courses that may be of interest for our teachers has been proposed as well.

However, the change should not be only top down. One should allow for interesting proposals to come up as well. This is why we have a call for proposals for teaching innovations, where faculty can propose concrete ways in which to improve their teaching practices. Every year we get around 100 proposals by groups of 4 or 5 faculty members with very varied and interesting ideas. We see that different cultures at the university move at different speeds and with different goals, but there is no problem with that. One should acknowledge these differences and allow all to advance with respect to their particular situation. At the end of each academic year, a selection of proposals is presented to get a better dissemination of good practices.

Using Research to Support Decision Making

The digital transformation of educational institutions must be supported by evidences, gathered through experimentation, taking also into account the contributions made by others. For this reason, institutions should also allocate resources to conduct applied research in order to improve their internal teaching and learning processes. UC3M has several experts in the field of applied research in educational technology, who have made significant contributions to face-to-face, blended and online education, carrying out pilot studies with students enrolled in the university, with the ultimate aim of improving their learning gains, developed skills, motivation, or reducing dropout rates, among others goals (Delgado Kloos, et al., 2019).

Within the several lines of applied research in educational technology developed at UC3M, some of them stand out: 1) the design, implementation and evaluation of online courses, particularly MOOCs and SPOCs; 2) the use of learning analytics for decision-making for students and teachers; and 3) the use of mixed realities (augmented reality and virtual reality) to enable the implementation of innovative educational experiences. In the field of MOOCs, for example, a framework was defined to facilitate the high-level instructional design of this type of courses (Alario-Hoyos et al., 2014), students' behavior was analyzed, particularly in relation to their interaction with course contents and social tools (Alario-Hoyos et al., 2016), as well as the motivation and self-regulated learning skills presented by this type of students (Alario-Hoyos et al., 2017), among other topics. In the field of SPOCs, the design, implementation and evaluation of this type of courses was assessed as an effort to complement traditional teaching on campus (Muñoz-Merino et al., 2017), the effectiveness of students when working with videos and exercises in this type of courses was also analyzed (Muñoz-Merino et al., 2015), as well as success cases for the implementation of flipped classes enabled by this type of courses (Alario-Hoyos et al., 2019b), among others.

In relation to the use of learning analytics for decision making, the existing related literature has been studied to understand the possibilities to predict dropouts and students' final grades in online courses, particularly in MOOCs (Moreno-Marcos, et al, 2019), a methodology has been developed together with a tool that implements it to help teachers understand what happens with students' interactions in the social tools used in online courses (Moreno Marcos et al., 2018), and learning analytics dashboards have been developed to understand students' interactions with learning contents, mainly videos and exercises, in platforms such as Khan Academy (Ruipérez-Valiente et al., 2015) and Open edX (Ruipérez-Valiente et al., 2016), among others.

Finally, in relation to the use of mixed realities, the literature related to the use of these to enrich the learning experience in STEM was reviewed (Ibáñez, & Delgado-Kloos, 2018), a methodology, PhyMEL (physical, mental and emotional learning), for the design of workflows in mixed reality environments that take into account digital objectives and students, including previous data known from the latter, was developed (Fernández-Panadero and Delgado Kloos, 2013), and augmented reality pilot studies were conducted with the aim to improve learning in various knowledge areas such as STEM (Ibáñez et al., 2014) and arts (Di Serio, et al., 2013), among others.

Learning with Others

It is of extreme importance to collaborate with other institutions to share one's own mistakes and successes and learn of those from others. This is the only way to be better prepared for the rapid digital transformation which can be tremendously overwhelming. Alliances must be formed with other universities which find themselves in different stages in this digital transformation and approach it from different perspectives. These alliances shall aim to explore existing opportunities with an open mind, broadly and deeply, collecting insights on how universities around the world approach the digital transformation.

UC3M has been strongly committed to creating alliances with other higher education institutions through university networks and educational research and transfer projects. In the area of digital education, UC3M has been part of the edX consortium (edx.org/school/uc3mx, uc3mx.es) since 2014, sharing with more than 120 educational institutions worldwide the passion for offering MOOCs and promoting open education. The edX Global Forum, the annual conference for edX members has been a meeting point with other universities to share and learn and also on the more technical side, the Open edX conference, which we hosted in 2017 together with EMOOCs 2017, the European MOOCs conference.

In relation to this, UC3M is also part of the EVE (European Virtual Exchange) initiative, a project that seeks to get students to obtain credit recognition for completing MOOCs offered by seven prestigious European universities (Alario-Hoyos et al., 2019a).

UC3M also participated in the SHEILA project "Supporting Higher Education to Integrate Learning Analytics" (sheilaproject.eu) with other universities in Europe coordinated by the University of Edinburgh. Deploying a learning analytics strategy has to be done taking all stakeholders into consideration and, of course, considering all applicable laws, including the General Data Protection Regulation.

UC3M, as a young 30-year-old university, is part of YERUN (Young European Research Universities Network) (yerun.eu) a network of 17 young European research-oriented universities created in 2015 with the aim to shape future education policies. Collaborating with other universities around Europe and exchanging best practices helps to improve all the partners involved. This approach is further reinforced by the initiative of European Universities proposed by the European Commission. UC3M is a member of one of the 17 approved European Universities in 2019, namely YUFE (Young Universities For The Future Of Europe) Alliance (yufe.eu). The aim to build a European University where students can, among other benefits, build a more flexible curriculum and study in a more seamless way between the universities is a very powerful advantage for the students, but as a side effect will for sure improve the practices of all universities involved.

With regard to educational research and transfer projects, UC3M has been especially active in Erasmus+ projects dedicated to capacity building in higher education for different regions across the world in order to disseminate best practices in digital education. In particular, there has been activity with Latin America, with projects MOOC-Maker (in relation to MOOCs) (mooc-maker.org), LALA (in relation to Learning Analytics) (lalaproject.org), and InnovaT and PROF-XXI (in relation to teacher training) (innovat.education), and

Southeast Asia with project COMPETEN-SEA (also in relation to MOOCs) (competen-sea.eu). Other recent noteworthy Erasmus+ projects in the educational field to share experiences across Europe or tackle specific issues related to the digitalization of higher education include COMPASS (for facilitating the detection of learning opportunities by students) (compass-project.eu), and BUDS (for the training of higher education faculty in digital transformation processes using blended models). Finally, the effort to promote open education, especially in the Spanish-speaking world, of the UNESCO Chair on Scalable Digital Education for All (“Educación Digital Escalable para Todos”) is also worth highlighting (educate.gast.it.uc3m.es).

Conclusion

We are sure that in the end the ideas presented here are not new. They have been implemented probably with variants and different emphases in other institutions. Maybe even with better results. At this point, it is important also to stress that the regulatory, funding, and customary context plays an important role that should not be forgotten.

We live in exciting but also difficult times. It is clear that we have to move, but do not know exactly in which direction. We will hear numerous experts preaching the “right and definitive” solution. We know that many will fail. But some may not. Staying still however is not an option either. You cannot wait until someone found the perfect solution, because you might not be able to adopt it then. You need to advance and learn on the way. Experimentation is a more successful attitude, even if you sometimes take the wrong decisions. This is very well pictured in Johnson’s “Who Moved My Cheese?” (Johnson 1998), where the characters in the book react differently to the absence of cheese. He proposes to monitor, anticipate, and enjoy change.

The major difficulty exists in finding the right balance of elements to change and the right speed of change. We are living in exponential times, so the acceleration of innovations will not help us to be more thoughtful. Another difficulty lies in the context in which we as public universities are immersed in, which often does not allow us to implement the decision we find more appropriate. The availability of the needed funding and to have the right instruments for change is another blocker. However, we should keep the mind clear to distinguish change just because it is convenient from that which brings us further in our mission.

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¹ Please apply the Harvard style system (UK spelling) for text and bibliography.

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