The missing link in Education (Part 1): Transgenic Learning as an innovation need

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Abstract

Usually, the cycle of innovation is sold as a great progress in Education. However, in Education, the cycle of innovation does not exist as we might expect. Innovation is cyclical by itself. Each step of the structure can be modified, improved and complemented without waiting for a whole process that shows logic in other areas (engineering, logistics, and psychology, for instance) but that, in education, seems to be a luxury. This position paper shows why and how to perform a dynamic innovation cycle that enhances learning and teaching experiences, Worldwide, including North-North, North-South and South-South approaches, supported by initiatives by UNESCO, the International Council of Distance Education, Open Education Consortium, the European Commission and others.

Keywords: Innovation cycle; Transgenic learning; Informal learning; Open education; Open Educational Resources (OER); ICT and Education

Innovation cycle and the Sustainable Development Goals

Our common ground is education. This is stated by the sustainable development goals of the United Nations (SDG). It is the objective 4: quality education

But the objective 4 is closely linked to other objectives, as the number 2, on eradication of hunger, or number 3 on health, or 8 on decent work and the 16, about peace. Education lives across society as a whole. And education requires innovation. Normally, the innovation is structured as a cycle consisting of 3 pillars: evaluation, quality and training. Personally, I think that there may be more. Each pillar will affect teachers, students, and staff support and management. In addition, innovation itself focuses on the educational system and the educational methodology.

What innovation means?

In short, what Innovation means? Why someone new at the leading post needs to re-modify everything from scratch? Why when a blue guy follows a red one, or the

other way around, education is always losing something good? Is that difficult to understand that something can be saved from burning to the ground?

Selective innovation over specific steps of methodology, assessment, training, content authoring or any other links of the chain, is a breakthrough. Simple, effective, encouraging. It means the missing link. We call it transgenic learning (#transgeniclearning) because it actually follows the same process, metaphorically speaking: out of a chain of parts, one specific part is taken, modified, and put back on the chain. To make it better, or faster, or cheaper, or more personalised, or localized, etc.

What we stand for is that the timely application of selective changes might mean a World, and it takes just a moment in the design of a lesson plan. The school teacher of the university professor is entitled to do so, without waiting for an overall regulation.

And nowadays, the real key, the golden rice of Education, that effective move that any docent can make on their own, is to combine regular academic programmes with informal learning. To integrate Open Educational Resources, MOOCs, SPOCs, Learning Objects and so many pieces of knowledge uploaded out there (we call it Internet), into their classroom. The challenge is to select the quality content. But the integration part should be easy. Formal and informal integrated, not that difficult and a huge breakthrough in Education.

What is transgenic learning?

Genetically Modified Organisms (GMO) is a controversial technique to produce new life or food based on the artificial modification of DNA [Apolinario 15, Millis 06, Burton et al 01]. Induced by an external disruption, a significant change happens, as if it might be part of the natural evolution of a species. In doing so, adaptation is forced into the natural course, so that an additional feature is provided to that species: from a stronger plant against stormy weather or a plague, to a vitamin embedded into a cereal that does not contain it by default, through the modification of a human protein. This external intervention is conflictive from a number of approaches: ethical, scientific, Societal and economic, to name a few. However, the possibility exists; and if smartly applied, it provides the human being with a new resource for progress.

Indeed, genetically modified organisms (GMOs) are those organisms in which the genetic material has been modified through modern technology to produce a new organism or the same one with a modified set of properties [Phillips 08]. For example, to remove something that does not work or may work better, it is later

modified and it is finally reinserted. It is a simple process: choose something that you want to modify, because it does not work, or because we want it to adapt somehow, modified it and reinsert it.

You can choose one that does not work well, which is not well suited, which can be improved, which can be complemented. We can choose, modify it, and reinsert it in the cycle. And all this, without waiting for a semester or a whole year. Innovation can be done immediately. Although there is no support to a lack of planning or an improvisation, a teacher (at school or university, everywhere) should not stand by the imposition of a cycle that is not the reality of their educational context, in the classroom. Innovation should serve as a healthy and continuous process of regeneration and progress.

A significant breakthrough in Education

Education, as a whole, nowadays, requires a disruptive boost [Collins & Halverson 10, Wrigley 09]. If we teach and learn in the same way that we did for the last 20 centuries; if we use the very same academic structures that 10 centuries ago; if we stress some methodologies from the early XX century; and if we use resources from before the rise of Internet; if all this happens, we will miss every single possibility that the last 20 years bring to the table. We will miss new, adapted, personalized ways to learn and to teach; to be more efficient, to get a better performance; to enjoy more the experience as a user; and to improve the competence and skill acquisition. Furthermore, we need to break this slow evolution in Education. The youngsters, the technicians, the mass media, the entertainment industry, all of them are far advanced from any practical implementation in the classrooms, from kinder garden to the University.

Open Educational Resources, MOOCs, Virtual Reality, Augmented Reality, Emotional Intelligence, Personalized Learning, Analytics and so many resources, services and approaches to complement, enhanced and evolve Education, as it is now [NMC 15, McGreal et al 13]. We need a radical innovation, to design a new paradigm, to complement the existing ones, to evolve with the actual users of the system (students, teachers, professors, tutors, parents) and not always far behind from them. We need a GMO concept into Learning and teaching, a transgenic approach to Education. Something that makes things evolve quicker and more adapted into a very specific and practical objective. And this is a complex challenge. Compulsory. Needed. Urgent. But a challenge, yet.

And out of this challenge, the most difficult part is to find the right integration between informal ways of learning, teaching and using daily services, with formal

courses and academic degrees; the smart combination of resources inside-outside the classroom; the update of accredited content with enriched, additional information outside the official syllabus that can fit into the same slot of educational competences [De-la-Fuente-Valentín et al 13, Dabbagh & Kitsantas 12].

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