Guest editorial

Rethinking higher education for the 21st century: a cyber-systemic contribution

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This special issue of *Kybernetes* is a contribution to the current crisis of education worldwide. The huge amount of evidence coming from the so-called science of learning is pointing to recurrent failures in the process of teaching at all levels: from schools to higher education in colleges and universities (Barnes and Aleman, 2017; Pascherl *et al.*, 2008). It started by shifting the main question of pedagogy from asking how teachers should be delivering their lectures to inquiring how students learn. This simple change in perspective moved the emphasis from designing teaching to understanding learning and allowed the entrance of different disciplines to the debate of pedagogy. Pedagogical problems were usually addressed by psychology and education. Nowadays, a great deal of research on education comes from neurosciences (Howard-Jones, 2010). Learning and teaching are being scrutinized from a more evidenced-based approach.

A few social thinkers in the past were aware of the pitfalls produced by a traditional education based on memorizing contents and centered in the abilities of the lecturer to transmit information. John Dewey in the USA pointed to the need of a learning based on meaningful experiences for students (Dewey, 1938). Before him, Rabindranath Tagore from India designed learning spaces for children based on a playful environment that connected cultural practices, sports and games to develop a natural learning atmosphere in schools (Tagore, 1929). In the middle of the last century, Paulo Freire from Brazil, criticized current pedagogical models by calling them a "banking model of education" that treated students as an empty vessel to be filled with knowledge. Instead, he argued, we should consider learners as co-creators of knowledge (Freire, 2007). Ivan Illich from Croatia argued in favor of expanding the realm and practice of learning to the life span of an individual. Every aspect of his/her life should be a learning experience that will help them become active citizens. He called that movement a deschooling society (Illich, 1971).

This special issue analyses some of these problems from a cyber-systemic perspective and proposes some alternative ways to proceed. It starts by describing a case study ranging over 50 years of a university in Europe that used systems thinking to successfully design and deliver programs on issues of management, leadership and governance (Schwaninger).

In the same line, the following paper by Olaya addresses the natural tension that emerges between academic freedom and managerial control in universities. The first comes from the autonomous process of knowledge creation, proper to universities. The second, from the need to have a viable organization with limited resources. The paper proposes a way to articulate both issues by suggesting some organizational forms in which university administrators and faculty can interact to produce free innovations in a pseudo-controlled organizational arrangement.

Then comes the question of how to teach systems thinking and develop systems practices as natural competencies in students. López Garay and Reyes describe a model that has been running in a regional university in Colombia since the last three years. The development of the model followed a cyber-systemic approach. From a methodological stance, this is a good example of a reflexive process: applying a way of thinking and acting to develop that same skills in students.

The paper by Perko and Mendiwelso-Bendek examines the development of student active citizenship using a Jean Monnet¨s module for a summer school with a participative approach and experiential learning. They point to the need for authentic situational-context experiences and active communication as important aspects in the learning process.

Next paper by Marino, Gutierrez and Aguirre proposes and evaluates a pedagogically sound and innovative strategy to teach a higher education course, whose aim is preparing future professionals to use information and communication technologies (ICT) for their personal and professional lives. According to the author, millennials are ill-prepared to use cutting-edge technologies in an innovative, responsible, and critical way in their future professions.

The REDINGE2 project was conceived as a technology-based educational transformation initiative whose main purpose was to transform engineering education practices by using technology-based active learning strategies with the Big-ideas approach. The main concern was to involve teachers in the process of rethinking and modifying their own pedagogical practices using ICT (Galvis, Avalo, Ramírez, Cortés and Cantor).

When we use ICT in learning environments a question about how to engage students in using this kind of technology emerges. It needs a big deal of intrinsic motivation from learner to spend time in exploring and mastering this technology. The paper by Dwivedi, Dwivedi, Bobek and Sternad Zabukovšek shows which factors are crucial to provide this engagement in postgraduate students. It seems that rapid feedback from teachers is one of them.

Today's world needs more intra and entrepreneurs and that spirit can be developed and nurtured at universities. The paper by Štrukelj, Zlatanović, Nikolić and Sternad Zabukovšek shows an instance of a cyber-systemic approach based on interdependence of teacher and students learning processes to develop competencies of creativity, teamwork and communication.

When teachers are engaged in self-regulated processes to critically examine their pedagogical practices, they need a pedagogical mentoring as the initial guide of the process. This is the statement that Hernandez and Flores uses to describe a case in which that transformation happened in a small regional university in Colombia. The paper shows the lessons learned from that successful experience to empower teachers.

Finally, the paper by Florez addresses the question of how to develop leadership competencies in students. It shows the organization of a leadership program in an engineering school where students play an important role in their own learning process by assuming active roles in the management of the program they take. A nice example of a self-organizing learning environment.

I hope you enjoy this special issue.

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