

Empowering Innovation and Creativity in the Educational Managerial Process

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Abstract: Education is increasingly facing challenges that involve adapting to change, as well as transforming the world in which we live. In modern knowledge-based society, creativity and innovation play a key role, being major strategic elements that contribute to long term economic growth. In fact education is the key to the global integrated framework of sustainable development goals. This paper highlights the need to empower innovation and creativity in educational managerial process and proposes several approaches. It focuses on issues related to creative learning and innovative teaching in societies where the acquisition of knowledge utilises forms of increasing intensity thus requiring changes and deep transformations in all educational environments. The fundamental objective of the paper is to underline the need to learn creatively and to teach innovatively, given that the development of information technologies and the many and varied sources of information, demand that students need to develop and expand their own personal learning approach. Based on scientific studies, best practices and comparative analyses, the paper identifies the facilitators which, along with technology, support creative learning and innovative teaching. An innovative management model in educational establishments with deep effects on the personal development of pupils and student, is described. The author proposes to implement Lean Management principles in educational process, as a tool to increase creativity and innovation in teaching and learning activities, as well as generate new added value to the educational process. A novel model entitled „Learning by development” has been developed, which focuses on learning through practical experience and emotional intelligence, factors that contribute to educational performance, as well as personal well-being.

Keywords: creativity, innovative teaching, Lean Management, value, knowledge.

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I. Introduction

“In a world flooded with irrelevant information, clarity means power”¹.

Y. N. Harari, in the book *21 Lessons for the 21st Century*, asks himself what we should teach? Many pedagogical experts claim that schools should start teaching “the four Cs”² - critical thinking, communication, collaboration and creativity. “In general, schools should reduce the role of technical skills and focus on the general skills needed in life. The most important skill of all will be the ability to cope with change, learn new things, and keep your mental balance in unusual situations. To keep up with the pace of change, you will not only have to invent ideas and new products - above all, you will have to reinvent yourself indefinitely.”³

Robert Greene⁴, author of the books *The 48 Laws of Power* and *The Laws of Human Nature*, notes that: “People are so focused on technology that they no longer focus enough on understanding human nature, which is the no. 1 competence you need in life!”

Dynamism, change, digitization and in general all the defining attributes of the period in which we live in, make the evolution of the society a provocative fabric, on which education tries to reshape the fundamental value elements.

The unprecedented digital transformation of global economy and society will increase the complexity of our modern world, increasing the speed of change, largely due to increased connectivity and educated people around the world. These two elements - the complexity and speed of change - indicate why connecting education to trends that shape the world we live in, has never been so urgent.⁵

“Urgent” means a call for action. But it is not necessarily negative, although surely population growth, societal aging, inequality, climate change and lack of resources, all force us to focus on sustainability and the needs of future generations. However,

¹ Y.N. Harari, *21 de lecții pentru secolul XXI* (Bucharest: Polirom, 2018), 18.

² C.N. Davidson, *The New Education: How to Revolutionize the University to Prepare Students for the World in Flux*, (Basic Books, 2017), 28.

³ Y.N. Harari, *21 de lecții pentru secolul XXI* (Bucharest: Editura Polirom, 2018), 262.

⁴ R. Greene, *The 48 Laws of Power* (London: Profile Books LTD, 2006), 102.

⁵ OECD, *Trends shaping education 2019*, https://read.oecd-ilibrary.org/education/trends-shaping-education-2019_trends_edu-2019-en?fbclid=IwAR2imPWtuMb3akcEvPQTJR5Abp33DqoGeJ8d1NkL3f_fGMkOEPKxFneBkEyw#page7.

the urgency also offers opportunities and a window of action, as evidenced by the power of digitization to transform, connect and empower.

Increasing the creative potential of educational organizations refers not only to the ability to be innovative regarding products or provided educational services, in addition to developing new ones, more or less apart from the existing ones. It also offers the opportunity to be innovative in management, identifying practical ways and solutions for problem solving that deviate from the usual track of existing practices. “Managerial innovation distinguishes universities, in a sensitive manner, in what regards the performance achieved in similar conditions and at levels close to the consumption of resources”⁶.

II. The need for creativity and innovation in education

Creativity and innovation are getting increasingly more important for the development of knowledge-based society, contributing both to the economic prosperity and to the improvement of life quality, of individual and social welfare. The above, are also essential factors for a more competitive and dynamic Europe. In this context, education plays a crucial role in promoting creative and innovative skills, requiring a rethinking of the management processes in this sphere of activity.

Thus, it is required to encourage the creative potential of pupils and students since⁷.

- The development of new information technologies that students use in everyday life can be exploited in creative and innovative ways of teaching, to help improve formal and informal learning;
- Immersion in this information environment influences the way of learning and understanding and therefore, teachers should develop creative approaches and find new methods, solutions, techniques and practices for greater involvement of students in their own learning approach;
- Creativity is a form of creating knowledge and therefore, the stimulation of creativity has a positive contagious action on learning, supporting and strengthening the self-learning processes, on developing competences and specific skills for the lifelong learning;

Creativity is conceptualized as a skill for all that can be developed, but at the same time can be inhibited, as well. Therefore, the stakeholders in education have the power to unlock the innovative and creative potential of young people, addressing creative learning and innovative teaching. Thus, creativity is defined both as a product and as a process that expresses the balance between originality and value. In other

⁶ O. Nicolescu (ed.), *Strategia Universităţii, Metodologii şi studii de caz* (Bucharest: Economică, 2007), 35.

⁷ A. Ferrarix, R. Cachia, Y. Punie, “Innovation and Creativity in Education and Training in the EU Member States: Fostering Creative Learning and Supporting Innovative Teaching,” *European Commission Joint Research Centre Institute for Prospective Technological Studies*, <http://ipts.jrc.ec.europa.eu/> (2009).

words, it is the ability to make unexpected and original connections, and generate new and relevant ideas. Creative learning is, therefore, any learning that involves understanding, awareness, logic, critical thinking that allow student to focus on thinking skills.

The new paradigm of social development, with rapid and profound changes generated prevalently by the development of information and communication technologies in our knowledge society, requires a new approach of the education systems in terms of innovation and creativity that contribute both to the economic prosperity and the development of life quality and individual and social welfare.

The educational actors must have a clear vision, awareness and deep understanding of what creativity and innovation entail, as well as their impacts, in order to fully comprehend the ways in which they can be improved. In addition, assessing creativity, will also involve the creation of a dual vision from the perspective of both students and teachers. Moreover, creativity in education is based more on process than on product and therefore, it requires the development of critical thinking and cognitive skills.

Creativity and innovation have strong connections with knowledge and learning. While intelligence does not seem to be a precondition for creativity, researches believe that prior knowledge, especially originating from a practical experience, is relevant to how one can become more creative. Moreover, creativity is regarded by several specialists⁸, as a form of conception, knowledge creation and building of personal development. Therefore, we can, with reasonable certainty state that being creative, is an essential skill to improve most learning processes. Thus, creative learning can be seen as a form of learning that does not foster memory but intelligence. Creative learning also determines innovative teaching.

III. Agile and Lean Thinking and Learning – new concepts in innovation of educational process

Applying the concepts of “Agile and Lean Thinking and Learning”⁹ leads to an improvement of basic educational experience, constituting tools and learning modalities based on creativity, critical thinking, collaboration, communication. It is in this way that it can respond to the more sophisticated and more dynamic learning

⁸ A. M. Loveless, *Creativity, technology and learning – a review of recent literature*, (No. 4 update), Available online:

<https://scholar.google.ro/scholar?q=Loveless,+A.+M.+Creativity,+technology+and+learning+ -+a+review+of+recent+literature&hl=en&a., 2007.>

⁹ D. Parsons, K. MacCallum, *Agile and Lean Concepts for Teaching and Learning: Bringing Methodologies from Industry to the Classroom* (New York: Springer Nature, 2019),

[https://books.google.ro/books?id=DM50DwAAQBAJ&pg=PA23&lpg=PA23&dq=design+thinking+\(DT\),+agile+methodology+and+lean+management+principles+in+higher+education&source=bl&ots=h6pnYeraiA&sig=ACfU3U2v45HTgP1uwhnkchl6O292LwGJbw&hl=en&sa=X&ved=2ahUKEwjK7dDrvtTjAhUBtYsKHdpZDIY4ChDoATACegQIDBAB#v=onepage&q=design%20thinking%20\(DT\)%2C%20agile%20methodology%20and%20lean%20management%20principles%20in%20higher%20education&](https://books.google.ro/books?id=DM50DwAAQBAJ&pg=PA23&lpg=PA23&dq=design+thinking+(DT),+agile+methodology+and+lean+management+principles+in+higher+education&source=bl&ots=h6pnYeraiA&sig=ACfU3U2v45HTgP1uwhnkchl6O292LwGJbw&hl=en&sa=X&ved=2ahUKEwjK7dDrvtTjAhUBtYsKHdpZDIY4ChDoATACegQIDBAB#v=onepage&q=design%20thinking%20(DT)%2C%20agile%20methodology%20and%20lean%20management%20principles%20in%20higher%20education&)

needs, which arise from the changes that are so profound needed in the current educational environment.

The starting point is represented by the four agility values presented in the document “Manifesto for Agile Software Development”¹⁰, as follows:

- Individualities and actions, over processes and tools;
- Meaningful learning, over measuring learning;
- Collaboration with stakeholders, over constant negotiation;
- Respond to changes, over following a plan.

Agile learning values and models are based on personal experience, social learning and holistic discourse learning and involve a number of characteristics, such as “communication, simplicity, feed-back, courage and respect”.¹¹

From the perspective of “Agile Thinking and Learning” we observe a shift of importance, as follows: from content to culture, from evaluation to feed-back and reflection, from control to confidence, from competition to collaboration. Fig. 1 depicts these changes in emphasis:

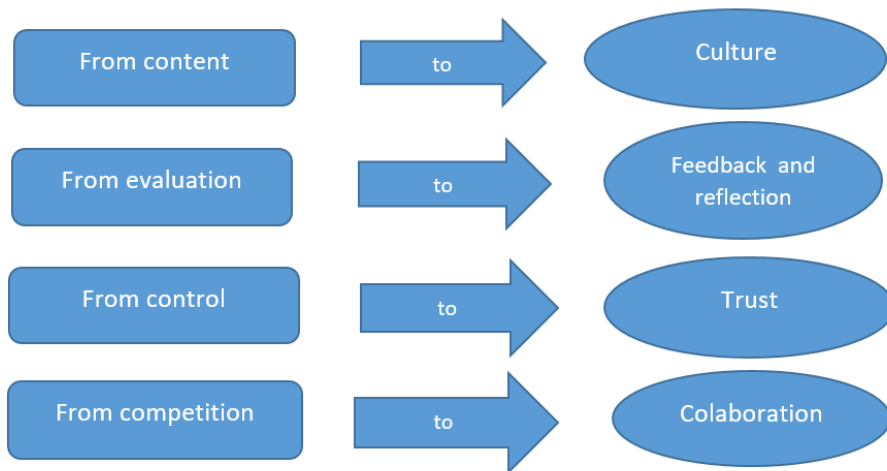


Fig. 1. Perspective of transformation according to “Agile Thinking and Learning”

Source: D. Parsons, K. MacCallum, *Agile and Lean Concepts for Teaching and Learning: Bringing Methodologies from Industry to the Classroom* (New York: Springer Nature, 2019), 16.

Agile organizations and teams are supple, flexible in modern management and leadership, in which the adoption of change is achieved in consensus with stakeholders, based on a realistic approach in terms of priorities and resources.

¹⁰ K. Beck et al., *The Agile Manifesto. Agile Alliance* (2001), <http://agilemanifesto.org/>, <https://pdfs.semanticscholar.org/3eda/bb96a07765704f9c6a1a5542e39ac2df640c.pdf>.

¹¹ K. Beck, C. Andreas, *Extreme programming explained* (Addison-Wesley, 2005), 102.

A rethink of agile values and principles offers a set of skills for agile learning and teaching based on new learning techniques, such as: stand-up meetings, paired teaching, storytelling and testing initial (the first development).¹²

Lean Thinking" complements "Agile Thinking and Learning" and aims to create more value while reducing waste and implicitly costs. Lean Thinking proposes that these can be achieved, through the following benchmarks¹³:

- understanding what value is for customers;
- reducing non-value and bringing activities into the system that lead to the speed of the processes;
- higher priority to positive processes;

In the specialized literature, five principles have been outlined which, when applied, contribute to the reduction of waste and to constructing a lean organization¹⁴:

- a) Specify value of product or services, having the client in mind;
- b) Identify the value stream for each service and remove the waste;
- c) Ensure that the value flow is without interruptions;
- d) Let the customers "pull" value from the producer;
- e) Pursue perfection (elimination of waste as a continuous process towards perfection- Kaizen).

This paper focuses on two basic principles specific to Lean thinking: 'flow' and 'pull'.

In education the goal is to provide a continuous flow of learning, without interruptions, providing students exactly what they need. The "lean" teacher will be engaged in the entire flow of learning values, working with colleagues throughout the process, pursuing more flexible learning components.

An example of the "flow" principle from the student's perspective is the ability to move on to the next stage of preparation or to a higher level, when it considers that it has completed its preparation, without waiting for the institutional calendar.

The "pull" principle in education means that students will ask from the value they need, from the teacher, when they need it. Thus the content of the learning will be transmitted to the students when necessary, over time intervals established by the institution. An example can be the flexible integrated request from employers regarding the knowledge, skills, abilities needed for insertion in the labour market.

In general, by applying "lean thinking" we aim to obtain:

- Better teaching-learning processes - offers students more value and higher efficiency (lower costs, lower losses);

¹² S. Peha, Agile Schools, *How Technology saves education* (2011), <https://www.infoq.com/articles/agile-school-s-education/>.

¹³ L. Tischler, "Bringing Lean to Office," in *Quality Progress* 39 (2006), ABI/INFORM Global, <https://pdfs.semanticscholar.org/f086/efb9fdec8aa3b38c5915d0e8222c3c2cf86.pdf>.

¹⁴ J. P. Womack, D. T. Jones, *Lean Thinking. Banish waste and create wealth in your corporation* (London: Touchstone Books, 1996).

- Better learning conditions - sharing of values and learning objectives, ability to meet these goals, greater ability to improve things (fewer restrictions, more opportunities), well-being in the learning process, integrity;
- Meeting the purpose and mission of the organization - growth, sustainability, value, impact.

To create a “lean university” requires a lot of work and perseverance from all educational actors, as this technique does not provide immediate results, but reliable long-term results.

IV. Lean Thinking Techniques

Lean Thinking principles can be applied to student groups through specific techniques, such as the Kanban method. The software developed by the Kanban method supports workflow management and is a method of organizing and controlling the activity “using a standard system of working cards, one for transport and one for production, between the jobs involved whose goal is to eliminate the waste of work and materials”¹⁵.

The Kanban method, can be used in education in a similar way, but with a greater focus on learning flow or evaluating learning activities. It can be used to illustrate progress in learning.

Kanban improves understanding, visibility and control of work and helps identify bottlenecks in the development in the learning process. “Kanban focuses on the workflow. Its use is motivated by the adaptability, the support given to the management by viewing the progress and its ability to lead the team members to collaborate and communicate.”¹⁶

The motivation behind the visualization is based on the ability to identify the constraints of the process and to focus on one element at a time. In the development of learning, the work elements are given, that is, pushed, to each member of the team, who is trained to finish as quickly as possible. The traditional development work is in the form of a chain in which the working element of a team member is handed over to someone else. This causes delays in the entire activity when the next line member is overloaded or has some problems in his work. Kanban works in an alternative way. Instead of pushing work objects, it promotes the shooting system. Each member of a team has an element available to work at any given time. When he / she finishes, he / she will automatically pull the next item to work on it. In short, Kanban aims to provide visibility into the learning development process, communicate priorities and highlight bottlenecks.

An example of the Kanban method can be seen in Fig. 2.

¹⁵ O. Nicolescu (ed.), *Dicționar de Management* (Bucharest: PRO Universitaria, 2011), 313.

¹⁶ M. O. Ahmad, J. Markkula, M. Oivo, “Kanban for software engineering teaching in a software factory learning environment”, in *World Transactions on Engineering and Technology Education* 12(3) (2014): 339.

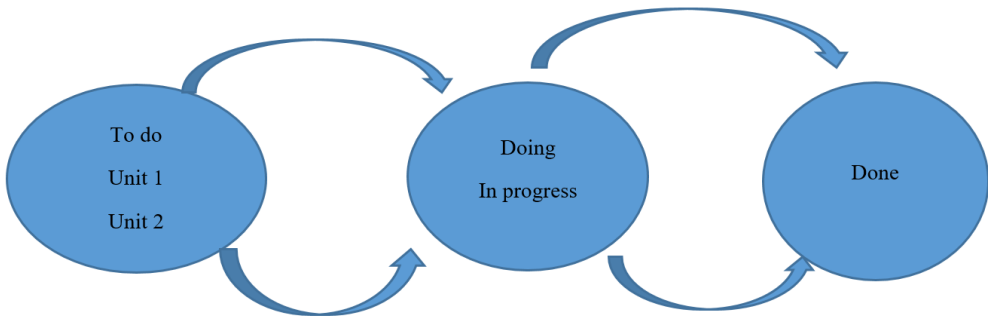


Fig. 2. Kanban method in a learning process. Source: the author

Another method used to streamline learning activities integrated into the Lean Thinking system, is Muda - a Japanese word meaning “loss”. Muda (losses, rejects, defects, waste) is one of the 3Ms, the other being Mura - irregularities (irregularities, interruptions) and Muri - illogical (excesses, tired or slowed down activities).

In general, the seven types of losses established in Lean theory are:

- activities that consume resources without adding value;
- mistakes that need to be corrected;
- services performed without being requested by anyone;
- unnecessary operations included in the educational processes;
- unnecessary movement of documents and people;
- unused available capacity;
- waiting for someone or something when someone asked for something;
- services that do not comply with the needs of the students.

Generally, there are two types of activities in the educational process: those that add value and those that do not. Thus, Muda can be classified in type 1 Muda, which covers all activities that do not directly add value to the educational service, but which are necessary for carrying out activities that add value and are related to quality control, human resources, accounting, administrative services, maintenance, etc. From the other category, Muda type 2, or in other words, the seven losses of which are those operations that can be eliminated immediately, without creating problems for the other activities.

The seven types of Muda in education can be explained, according to Table 1.

Table 1. Muda types exemplified in education. Source: D. Parsons, K. MacCallum, *Agile and Lean Concepts for Teaching and Learning: Bringing Methodologies from Industry to the Classroom* (New York: Springer Nature, 2019), 16.

Muda	Examples
Overproduction	<ul style="list-style-type: none"> • there are too many courses offered for the same learning outcomes; • they are units of learning that are repeated in several courses for the same field of study; • irrelevant information provided to students who do not facilitate learning outcomes;
Defects	<ul style="list-style-type: none"> • students are not offered the most relevant resources for quality learning; • innovative teaching-learning methods are not used; • there are frequent errors in learning and managing resources; • the contents are not correlated with the expected learning outcomes (knowledge, skills, competences, attitudes); • loss of talent and unqualified abilities; not using the creativity of human capital;
Unnecessary inventory	<ul style="list-style-type: none"> • a too large amount of information is offered to the students in the learning process; • it takes too much time to provide learning support; • it takes too much time to make the feed-back; • accumulation and use of unnecessary materials and information - irrelevant, redundant, outdated.
Inappropriate processing	<ul style="list-style-type: none"> • the carrying out by the academic staff of excessive administrative activities: reports, various documentation; • carrying out irrelevant and unapplied research activities in the teaching-learning process; • excessive effort in order to provide various services; • Requesting the approval signatures from several persons whose authorization is superfluous; • inertia and resistance to change;
Excessive transportation	<ul style="list-style-type: none"> • unnecessary trips of learning resources; • inefficient information flow over long circuits generating a series of malfunctions; • moving documents from one place to another;
Waiting	<ul style="list-style-type: none"> • Stakeholders are waiting too long to be properly informed; • The information does not flow directly on the shortest route; • Expectations caused by too complex procedures; • Unclear levels of responsibility and inadequate delegation; • Some processes are delayed, waiting for something to happen;
Unnecessary motion	<ul style="list-style-type: none"> • There are activities, studies, reports and other efforts appreciated as useless, without being found in the efficiency of the educational act.

After identifying Muda, the question arises how to intervene in order to eliminate the activities that do not add value, to improve the quality of the educational service, to increase the welfare of students and academic staff with effects on sustainable development and quality of life.

Another Japanese method that we can adapt to improve the quality of education is Gemba, which translates to the "real place", where the action of interest happens - where the valorisation activity takes place.

It is also important to intervene even with regard to the recovery of the minimum times, if the operations are repetitive. Loss interception can start from anywhere, even from the minimum time recovery. "By minimum times we can understand those times that can be recovered by the on-site analysis (in Japanese *Gemba*) of the operations carried out by the people, while they are working. We have to keep in mind that there are two types of minimum times and therefore we have to treat the two categories in different ways"¹⁷:

- Time lost for operations that are not required during the educational process;
- Time lost in the form of "empty walks", that is, the time that the staff devotes to finding the documents that are not in the preset place, of the equipment that must be available.

A modern concept is "gemba walk", which means visiting real places outside the university environment, where students practice or internship, to identify problems and "move".

Students must be able to apply the theoretical knowledge, working in the real environment, having very clear requirements in solving problems and identifying losses. The concept "Gemba" is very close to "real-world learning" and problem solving, which represent the basic skills in the 21st century.

The application of the "gemba walk" method involves the following steps, according to Fig. 3.

In our model, human development must be included in each process, which brings us closer to the essence of Kaizen strategy.

The Kaizen strategy is based on the participation of all educational actors and aims to gradually improve the quality of the educational process, through a continuous, gradual and participatory approach. It is a holistic concept, because all activities, all processes, all educational actors, the whole environment must benefit from continuous improvements, as vectors in increasing quality. The Kaizen strategy is achieved with small steps, continuously, by each person in the educational organization, through systemic actions and have long-term effects. At the same time, Kaizen is a culture that influences the behaviour of staff throughout the organization.

¹⁷ I. V. Drăgulănescu, D. Popescu, "Calitate și competitivitate: O abordare Lean Six Sigma," *Amfiteatrul Economic* 17(9) (2015): 811.

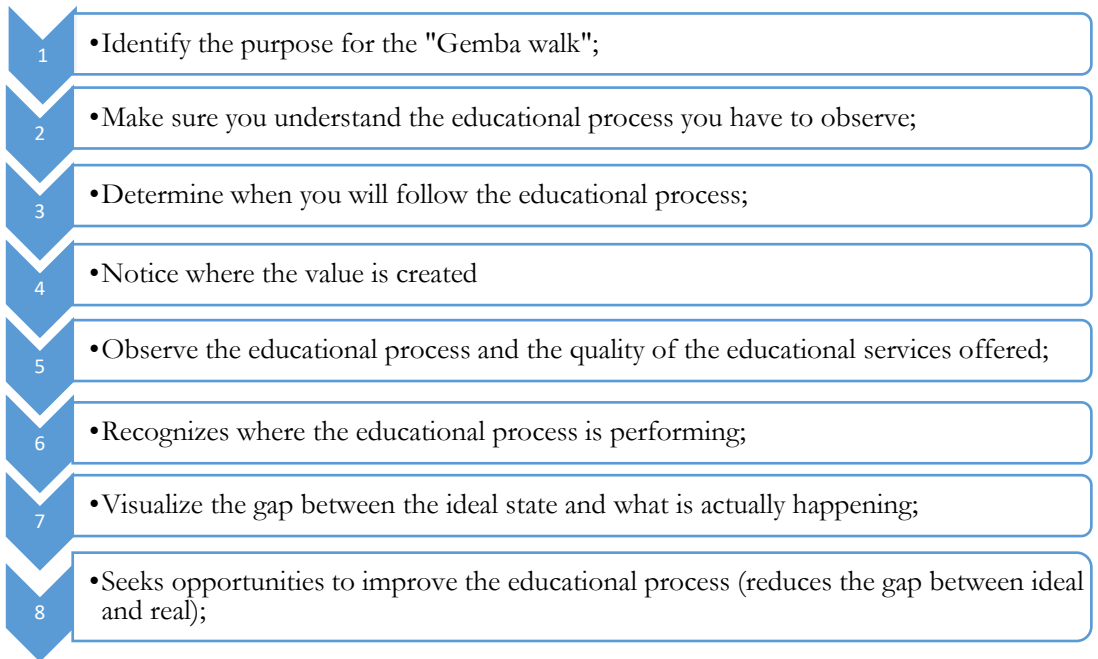


Fig. 3. Steps in the “gemba walk” application. Source: M. A. Imai, *Common Sense Approach to a Continuous Improvement Strategy*, 2nd edition (McGraw-Hill eBooks, 2012), 14.

Kaizen behaviour can be observed in various contexts:

- Daily improvement activities by academic leaders and staff;
- Improvement of teaching-learning processes;
- Kaizen leadership and development strategy;
- Coordination support for all Kaizen activities.

The purpose of the Kaizen strategy in educational organizations can be realized in:

- Making the teaching-learning process easier and adapted to the real learning needs of the students;
- Ensuring the well-being of the students and the entire academic staff against the background of improving the quality of all components;
- Making the processes faster, continuous, without stagnation.

The Kaizen strategy focuses the entire attention of the management towards “Gemba” - where the activities that bring effective and direct value to the educational service are carried out, to the whole process of obtaining the satisfaction of all the educational stakeholders.

V. “Learning by developing” – a new educational model-based Lean technique

Starting from the Lean techniques, this paper designed an educational model that better responds to the real needs of students for a successful insertion in the labour market, with positive effects on personal development and quality of life.

The central point is the relation with the real environment, with the analysis on the spot (Gemba), so that the student, teacher, entrepreneur relationship is a real one, responsible, motivating, performing. This model is based on the realization of projects (project based learning) with organizations from the real environment, having as support the effective collaboration, on the basis of networks of work built and consolidated in time.

The model can be summarized in Fig. 4, as follows:



Fig. 4. The “Learning by developing” Model. Source: the author

This model integrates into its structure learning communities, set up as working networks between students, teachers, employers of the business environment, who through an innovative process, build new knowledge and form skills, competences, behaviours, attitudes specific to the world we live in, so intense in unprecedented transformations.

It is also a “Peer to Peer” model seen as a modern learning method that extends to teachers and specialists in companies and is characterized by the following aspects:

- Students work in an open environment, with all the challenges of real life;
- The student’s activity is based on the way they understand the information and apply it in practice;
- Students are trained in the realities of work and the challenges in the business environment.

From this perspective, the courses in the amphitheatre are transferred to the real environment, in which the students and the teachers and specialists of the companies must prove initiative, responsibility, teamwork skills, social skills, role-taking, etc.

We can talk about personalized learning, using “Gemba” techniques, understanding “Muda” acting in the Kaizen spirit and thinking of solutions to continually improve processes and add value. Thus, quality is created, of another kind, a relevant quality that facilitates sustainable employment, personal development and active citizenship.

This model is focused on quality culture and is based on development vectors, such as:

- Vision and values;
- Leadership and coaching skills;
- Collaborating teams;
- Clear roles, Responsibilities;
- Trust;
- Flexible and agile work;
- Change management;
- Psychological safety;
- Performance and efficiency management.

The “Learning by developing” model is a model that is based on creative learning in which each actor assumes clear roles and responsibilities and in which the Agile and Lean Thinking techniques integrate and lead to sustainable results for the entire educational system.

VI. Conclusions

Faced with the challenges of today’s society, characterized by complexity and the speed of rapid change, education must be connected to the trends that shape the world we live in. Moreover, education in turn must find innovative solutions and bring social benefits, being a driving force in the development of society as a whole.

Innovation and change occur in all contexts of social, economic, technological, cultural life, but especially in education, having as a coordinating vector management and organizational leadership. It must be stressed that change must result from each one, through specific activities, learning to do things right the first time and each time.

Innovative value-generating educational processes are based on “Agile and Lean Thinking” techniques. This means that we need to be closer to the real environments in the spirit of “Gemba”, to identify “Muda” and to act in the direction of continuous improvement, applying the “Kaizen” strategy, both in the sphere of didactic and administrative processes.

Applying the “Learning by developing” model, based on student-teacher-specialist cooperation from companies, the premises for 21st century training skills are created, which include: communication, critical thinking, problem solving, cooperation, creativity, teamwork and others.

Giving information is the last thing that education needs. We need to teach young people through this model to gather information from different learning environments alone, determine which ones are relevant or less relevant, and more than that, combine information and knowledge to get a whole unitary, an overview of today's world.

Innovative managerial processes represent the support and the bridge between the expectations of the educational stakeholders and their degree of satisfaction, being the source of which the culture of quality is extracted and developed in the educational sphere.

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