OVERTAKING THE NO SIGNIFICANT DIFFERENCE PHENOMENON: AFTER THE LEARNING MEDIA EVOLUTION, THE TEACHING PARADIGMS REVOLUTION. FIRST RESULTS AT GUGLIE MO MARCONI UNIVERSITY

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ABSTRACT

The No significant difference phenomenon has been the result of several researches, over the years, that compared traditional classroom lessons with other learning media (video and audio lessons delivered by TV or online, using mobile devices, etc.). Replacing one technology with another, without any change in how we intend teaching, will have little impact on learning. Otherwise, we do obtain relevant gains if we change technologies but using new teaching paradigms, able to face the digital learning environments. Gugliemo Marconi University’s revolution starts with Economic courses, trying to build also a bridge with business training, searching a new learning way to create a knowledge creating system, more than the sum of different learning objects. According with first results, we have observed that in the “innovative” Economic course, students get better marks and results compared to the same traditional courses. So we guess that there is a significant difference, after all.

KEYWORDS: Strategic behavior, Interactive teaching/learning, Simulations, Serious games, No significant difference phenomenon

DISAGREEING WITH THE MYTH OF THE NO SIGNIFICANT DIFFERENCE PHENOMENON: TEACHING STRATEGIES AND THE CONSTRUCTIVIST APPROACH

The No significant difference phenomenon is the title of a famous book written by Thomas Russell (2001). According to this book, making a comparative research on technology for distance education, it seems not to be significant differences in student outcomes between alternate modes of education delivery. That has been the result of several researches, over the years, that compared traditional classroom lessons with other learning media (video and audio lessons delivered by TV or online, using mobile devices, etc.) (Ramage, 2002). Replacing one technology with another, without any (other) change in how we intend teaching, will have little impact on learning.

So, why we are so interested to experiment new teaching and learning tools? On my opinion, we are not asking ourselves the right question. Of course, if we use the same teaching way only changing the media, why should we expect something to change? The boring lesson made by a mono-tone speaking professor inside the classroom, or in a video on YouTube is always the same boring lesion, and produce the same results.

There is not an (only) media factor. There is a wider teaching factor. Our question would be: what is the right way to teach? What we can do to do that? After, considering our students, we can
ask ourselves what are the correct medium we can use to deliver concepts.
Teaching is a very difficult way to communicate. It means also to drive someone somewhere. To
do that we can use our role, or, better, also our coaching style. Only in the second way we can
obtain a result “inside” our students.
First of all, we need to know our students and the world they are living. The world changes very
quickly, and values variation is as common as underestimate effect of those changes. Our life is
full of connections and stimuli, news and provocations.
Reports about the use of technologies in the schools in the USA show difficulties of teachers
in integrating technology in the classroom. In particular, only 39% of them make a “moderate”
or “frequent” use of informatics instructional tools (See, for example the researches made by
Jeffrey R. Young, 2010, or by the Grunwald Associates for the Walden University, 2010). Why? In
2008, the 60% of American teachers confirmed they had some technology-related professional
development in the previous year, but less than the half of them thought that it has been useful.
The fact was that the instruction they receive in technology integration was still too focused on
learning how to use the software versus integrating it into the teaching and learning process.
Analyzing this situation, Mary Burs proposed to use, also in learning technologies, the 5Js
approach: a managerial method developed in 1990s that can help educators to focus on
“essential practices that promote quality implementation of an innovation” (Burns, 2010).
According to her, by using this approach, technology-related teacher professional development
should be:

• **job-related**, focused on the core competencies of the classroom, not technology
• **just enough**, emphasizing increased comfort, not proficiency, with computers
  and management of limited technology resources
• **just in time**, meaning teacher are provided with skills as and when needed
• **just in case**, teachers need to plan for contingencies
• accompanied by a just try it attitude, wherein instructors apply both pressure
  and support to compel teachers to use what they’ve learned. (Burns, 2010)

To have answers from educational system, probably we should ask ourselves how new
technologies can help us to make students understand better what we want to communicate
them. In other words, to obtain results we have to integrate technology into instruction and
assessment, along with a constructivist approach. According to the Constructivism, people
“construct” their own understanding and knowledge of the world through experiencing things
and reflecting on those experiences.
In this order of things, learning is an active process, knowledge is constructed from experience
and shaped by them. From this point of view, learning is a personal interpretation of the world
(See Jonassen, 1991; Von Glaserfeld, 1984; Brooks and Brooks, 1993; Ganatra, 2012).
If we think that it could be a useful way to do our job as teachers, we can use technology to:

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2 See, for example the researches made by Jeffrey R. Young (2010) or by the Grunwald Associates for the Walden University
(2010).
3 See the research of the National Education Association (2008) about the access, adequacy, and equity in education techno-
logy: results of a survey of America’s teachers and support professionals on technology in public schools and classrooms.
• emphasizes problem solving, also by using authentic tasks, experiences, settings, assessments
• present content holistically, not in separate smaller parts
• pose problems of emerging relevance to students
• emphasize hands-on, real-world experiences
• see and value students’ points of view
• look at the Social context of content.

A Constructivist approach can help students to pursue their personal interests, to use and develop their capabilities, start a lifelong learning path.

Applying constructivism in the classroom means posing problems that are or will be relevant to students.

Brooks and Brooks (1993) summarize a large segment of the literature on descriptions of constructivist teachers. A constructivist teacher should encourage and accept student autonomy and initiative; use a wide variety of materials, in particular interactive materials; encourage students to ask questions to each other and assess students’ understanding through application and performance of open-structured tasks.

In other words, the lesson is that technology can be a factor only if there is a different way of teaching.

Learners experience the world subjectively, by creating subjective representations of the reality. This subjective representation of experience is constituted in terms of senses (vision, audition, tact, olfaction and taste) and language. People describe and understand the world in terms of different sense-based subjective representations, usually preferring one sense to the others. Any student will think and remember by using a different sense (See Dilts et al., 1980; Grinder et al., 1976 and 1977). A better-organized way to learn can be obtained by the harmonization of knowledge delivery and, above all, by using all possible channels (textual, audio, visual, feelings, and virtual experiences). In this way, we can obtain the best outcomes in teaching (Carr, 2012; Schagaev et al., 2014).

Students, also, have different capabilities, interests, expectations and learning strategies. They learn by adopting different personal information strategies, in this way they integrate new information items into an existing logical schemes, in different ways, as demonstrated by international researches (Hardof-Jaffe et al., 2009). This process has, of course, implications for learning and consequently should have consequences in teaching (Hardof-Jaffe et al., 2009).

Classroom, social media, online course, tutors’ support, simulations, games, virtual experiences and laboratories are all a set of stimuli that can delivery concepts and, better, can make student build their knowledge along their skills and capabilities, also making them to use all their sense,

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4 In an international research, authors found four major types of personal information strategies: 1) Filing – keeping most of the files in the root directory. 2) One folder filing – filing most of the items in one folder. 3) Small folders filing – organizing items in many small folders. 4) Big folder filing – a mixture of filing most of the documents in different folders, but still maintaining one sub-folder containing many files.
reaching any subjective representation of the world and any learning strategy⁵.

As written by the New York Times journalist David Brooks about “The campus Tsunami” of the online learning:

The most important and paradoxical fact shaping the future of online learning is this: a brain is not a computer. We are not blank hard drives waiting to be filled with data. People learn from people they love and remember the things that arouse emotion. If you think about how learning actually happens, you can discern many different processes. There is absorbing information. There is reflecting upon information as you reread it and think about it. There is scrambling information as you test it in discussion or try to mesh it with contradictory information. Finally there is synthesis, as you try to organize what you have learned into an argument or a paper. (Brooks, 2012)

Professors and teachers should modify their approach every year, preparing their next class, by using the feedbacks coming from previous classes. Nevertheless, often they are too busy and they have no time to upgrade their teaching strategies and methods. Jeffrey R. Young wrote about what Chris Dede, a professor of learning technologies at Harvard University, had told him about this phenomenon.

If you were going to see a doctor and the doctor said, ‘I’ve been really busy since I got out of medical school, and so I’m going to treat you with the techniques I learned back then’ you’d be rightly incensed […]. Yet there are a lot of faculty who say with a straight face, ‘I don’t need to change my teaching’ as if nothing has been learned about teaching since they had been prepared to do it – if they’ve ever been prepared to. (Young, 2010)

For teachers it seems to be very difficult to understand that, before all, they should be learners about teaching methods, and that they should be worried about that, in the same way they feel important to upgrade their knowledge in their own matters.

**HOW TO INTEGRATE GAMIFICATION AND CONTENTS IN OUR TEACHING STRATEGY**

Looking to the tools, simulations and games, it seems that the most powerful tools create the right learning context. We are talking about interactive tools delivered by computer or mobile technology in a role-playing context. With this kind of tools we can maintain a high level of

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⁵ In this context, another very powerful (unexpressed) learning tool should be the blog. Blogs facilitate information organization, inside a constructive cognitive process that can make learning more effective by a personal external representation of information (managing information the writer relates them to the context of its future research and use), facilitating new knowledge creation and, therefore, autonomous learning. In addition, when learners reflect and monitor their own learning in public (as using a blog), the level of self-regulation increases, rising self-efficacy. Working independently in a positive environment should increase self-efficacy for that task in the future. Blogs are not only tools for self-expression or social interaction, but they also have the potential to influence the cognitive processes of learning. (Baggetun, Wasson, 2006; Yeo, Lee, 2014).
motivation in learning, and students can acquire knowledge by solving real-life problems or real situation (Chen, Wang, 2009). The learners research contents (inside and outside the digital tool) to solve puzzles and situations in the game in a problem solving dynamic. In addition, the kind of simulation has different effect in players and learners. Here it is very important to stress the pedagogical and educational value of these tools that can make people learn by entertainment, enjoyment, participation using an instructional approach (Connolly, Stansfield, 2007). In this case, educational contents are integrated into digital simulations leading to the achievement of better result than the traditional way of teaching. However, this sort of game-based learning is a part of the story. Of course, we can use games to help the learning process, but we can do more. We can think game elements in a non-game context to integrate strongly all the learning tools available (Deterding et al., 2011), aiming to make contents easily understood by students, improving their capabilities, in the way they usually learn. It means using the philosophy of gamification, that, according to Gabe Zichermann and Christopher Cummingham, is “the process of game-thinking and game mechanics to engage users and solve problems” (2011). By using this technique, we can obtain a communication very close to a game but in an educational contest (even if in an education by enjoying and engaging learners).

In a good teaching strategy, the key word is integration. A good resume of the final goal of the use of games in teaching, in a constructivist approach is what was written by Panoutsopoulos and Sampson (2012).

By designing and implementing meaningful activities with the support of the selected game we offered opportunities for engaging students in problem-solving actions. Students were able to formulate and test their own hypotheses, observe the outcomes of their actions, compare and contrast data available from the game, justify and evaluate outcomes of performed actions.

Again the challenge is not in the choosing of the right media or the project of the right tool, but the drown of the right teaching and communication strategy.

Furthermore, when you have a distance-learning course, you also do not know exactly who your students are, what are their capabilities or their learning strategies or subjective representation of knowledge.

In this case we have to develop two different behaviors.

First. When we project the course and the tools inside it, we should use all the possible

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6 For example, different researches have demonstrated that by using tools like video action games, people can increase cognitive abilities in particular to switch efficiently between tasks, a very important skill for students but also for managers. Those who play this kind of action games, demonstrate on average, switch cost advantages into manual and vocal responses, also wherein the switch required a goal shift or the ability to map and re-map decisions. Advantages are the same in case of predictable or unpredictable switches. Furthermore, switch-cost advantage was not different between tasks that was more perceptual in nature (color/shape) and others that are more cognitive in nature (odd/even, high/low), which requires access to, and to some extent, manipulation of, internal representations. See Andrews, Murphy, 2006; Boot et al., 2008; Karle et al., 2010; Colzato et al., 2010; Green et al., 2012.

7 The difference between gamification and game-based learning is in purpose and instructional goals. Gamification wants to motivate and change learner behaviors, by adding gaming elements (competition, rewards, mastery, and productivity) into educational tools. Game-based learning aims to promote learning by using the games for teaching knowledge and skills also by games.
strategies, making information flow by all the senses, also helping both the analogic and synthetic approaches. That is why the media integration is so important. Also video-lessons are important and the way we are teaching is delivered by using the subjective world of any students. Real life exempla and metaphors are the best way to help the learning process from the tacit to the explicit Knowledge (Nonaka, Takeuchi, 1995).

Second. When, after, you can personally enter in contact with your students, the tutoring and the coaching aspect of your work must do its job. Therefore, you have to address any student to their own specific learning path, helping them to put any concept, information or communication element in their representative system in the right way. Now you can use different teaching tools to personalize the learning experience inside the redundant learning world you created by projecting your online course.

This second moment is important because students should lose themselves inside the jungle of tools, worlds, sensations, picture, videos, role-playing you have created, and their brain should be overload of information. The learners have to find their own personal learning path, but they need also your help and coaching guide. That is the case of students’ problems with MOOCs (Massive Open Online Courses). They are revolutionary resources, but of the thousands of students who have signed up for the classes, only about 10% complete them. That is because sometimes MOOCs promote an unrealistic one-size-fits-all model of higher education and that there is no replacement for true dialogue between professors and their students.

Simulations and games can be very powerful instruments to develop proactive behavior and increasing in students’ motivation. Lots of recent researches show how games should be useful inside a learning strategy and how it could be possible to coordinate their usage with the complexity of contents.

A useful way to deliver contents is to make students find them inside the game context, for example by the interaction with Non Playing Characters. A research shows that it seems to be more effective than if they are available by a sort of menu. Quests were found to exert significant influences on students’ perceptions, including enjoyment, goal orientation, and goal intensity. In addition, the findings revealed that quests encouraged active participation and increased the intensity of attempted learning behaviors (Chen, Liao, et al., 2012). Consequently, we can assume that contents should be given usually by quest and Non Playing Characters or in the context of the game or simulation, or, in alternative, by making learners discover relations between variables, context and behaviors. For example, in the simulations we delivered at Guglielmo Marconi University, as we will see forward, there is usually a board of colleagues, experts or counselors (that are Non Playing Characters) to whom the students, playing their role, can ask some questions, obtaining the contents whenever they are looking for information.

8 These are some results of the study about the influences of Game Quests on Pupils’ Enjoyment and Goal-Pursuing in Math Learning. Researchers analyzed whether using the quest in the game would help learning outcomes. They compared a game where learning materials, useful to solve puzzles, are given by the interaction with Non Playing Characters (the so called NPCs) with a similar version in which they are available by a menu.

9 Of course, if it is very complex and contents wide, we can provide them by the use of tutorial or dedicated menus. In a research about the Impact of tutorials on games of varying complexity, authors show that the usefulness of tutorials depends greatly on game complexity. Learners would use tutorials and go to contents, using them actively, if they are facing complex simulations. Otherwise, in case of easy to understand simulations and games, learners can discover the rules and the relations just through experimentation and by playing. It is immediate, and in this case, it is useless to create large and complex tutorials or reading contents (Andersen et al., 2012).
linking concepts to an experience.
The interaction with the context can make the experience stronger, and games and simulations have the potential to provide concrete learning experiences and allow for drawing links between abstract concepts and the real world as the students know\textsuperscript{10}. It also strongly increases motivation, making the students understand they are learning in their world and for themselves, something that involves themselves, and not subjects that refers only to school or educational system.

Finally, following also Raymer (2011), we can try to identify some relevant element to design a good game in the e-learning context.

1. Setting increasing goals and objectives, in coherence with the skill levels of the player. It can allow users to learn new skills incrementally, and then practice those skills before demonstrating mastery of those skills in the assessment exercises, the game is considered motivating, challenging and interesting (never boring nor impossible to solve), making people remaining in what some psychologist call the “flow state”\textsuperscript{11}

2. Use the context to give concepts and instruction (for example by using non player characters, as said before)

3. Provide frequent feedbacks and measure the progress. It makes learners know if they are on the right path and if it is necessary to find out new elements and contents from the characters or the situations of the game

4. Rewards are important. It is important to add rewards for success, of courses, but also for efforts. It would be useful also considering rewards given based on time of playing and on number of action made. It would increase the motivation of learners.

GUGLIELMO MARCONI’S LEARNING/TEACHING STRATEGY IN ECONOMICS COURSES, BASED ON SIMULATIONS AND SERIOUS GAMES

Learning is change. Especially in a changing world, full of connections and proactive and virtual situations. The need of use new tools in teaching is a new unknown field, and we have no clue where it can lead. It is our wonderful challenge. We can really use many tools, especially in e-learning classes (MOOCs, dynamic video-lessons, blogs, virtual communities, virtual laboratories, etc.) within a constructivist-pedagogy approach. However, we have also to rethink contents and learning approaches, along self-creating knowledge systems, able to change with the world they try to describe.

At Guglielmo Marconi University, we started our revolution, in Economic courses, trying to build also a bridge with business training, searching a new learning way to create a knowledge creating

\textsuperscript{10} According to some research, that can be possible also when we are teaching abstract matters and concepts (Panoutsopoulos, Sampson, 2012)

\textsuperscript{11} According to Csikszentmihalyi people are more motivated when they are in a state of the so called “flow”: a state of concentration or complete absorption with the activity and the situation. The flow state is an optimal state of intrinsic motivation, where the person is fully immersed in what he is doing (Csikszentmihalyi, 1990). In a game, as the challenge of an experience rises, the skill of the participant must also grow. If a player’s skill exceeds the challenge of the experience, they will become bored. In addition, if the challenge exceeds the participant’s skill, they will suffer anxiety. The challenge should be in line with the learner’s skill, to be sure that they can remain in the “flow state” (Raymer, 2011).
system, more than the sum of different learning objects.

To change the way to teach in Economics, it is necessary to think that the period we are living is full of changes and transitions, especially within the economic and financial context. Consequently, we have thought that it is important to give students new points of view and new models to help people understand what is going on.

So our objective was to completely redesign the courses in Economics and Monetary Economics held at Guglielmo Marconi University by extending contents of the course (by changing the point of view often used) and introducing new interactive teaching/learning tools, allowing students to deal with complex changing systems, in particular simulations and serious games. Our project involved the design of new courses, which would develop both technical and problem solving skills, allowing for a creation of a sort of laboratory where students could deal with new paradigms and new ideas. For the aim of the present paper, we are going to focus on the simulation.

We got the result by giving different prospective and paradigms, asking students to find their way to define the state of things and creating a laboratory where students can develop a new systemic and holistic way of thinking. To do that, we redesigned contents, introduced new theoretical paradigms next to the traditional ones (trying to explain them in a simple way)\textsuperscript{12}, developed students’ problem solving skills and gave them a systemic vision, by adding simulation to our tools. We will talk about this second aspect, but it is important to understand that it is part of one big teaching strategy.

Simulations are our most powerful tools, even if it is not the only one. With our simulations we are able to drive concepts, paradigms, but overall the sense of the knowledge evolution and, with our latest projects, also the idea that it is possible to understand the relations between also weak links, making students (and learners in general) able to understand the value of collaboration.

Designing the educational game/simulation (and, before it, to decide if undertaking it) means to analyze purpose (also in terms of motivation and students’ behaviors), expected outcomes and results of the teaching path, and, finally, find the way to get there (Yang, 2014).

The goal was to make students think in a strategic way, teaching them to build their own paradigm to explain real world. Now, we are also starting to analyze our results, to understand where we stand in our way. We already know the strangeness of gamification as a new learning/teaching strategy.

Generally, we introduce a role-playing tool (in this case a simulation or a serious game) when we want to make people develop problem-solving strategies in a complex system. In fact, the complex systems are counter-intuitive: when you link a large number of variables, you consider only few relations that you consider dominant in your representative system. Going from one

\textsuperscript{12} For a deep analysis regarding the changes in the contents of classes in Economics and Monetary Economy, see Petrocelli, 2015. To give an idea about the structure of the curses and in particular the innovations, we can say that, for instance, in the Economics course, traditional microeconomic and macroeconomic issues as well as the systemic view of the Economy were introduced (in Sraffa and Pasinetti’s style). In addition, Akerlof and Shiller’s vision of animal spirits in the Economy was included which tried to make students understand the importance of social systems during a country’s economic development and depression. Furthermore, in one module of the lecture, corruption, nepotism and clientelism (market of favors) were shown which can make competitiveness decline in a productive system where different social roles could be more relevant, referring in particular to Italian case (Akerlof, Shiller, 2009; Petrocelli, 2008). Instead, in the course of Monetary Economics, as well as the well-known theories and concepts about the role of money, we introduced paradigms based on trust, credit crunch and strategic behavior of banks and financial operators. We presented Stiglitz and Greenwald’s new paradigm, trying to demonstrate when monetary policy is unable to achieve results. In this lecture, the role of social systems and how social behavior make speculative bubbles occur is also presented, even if they are not rational behaviors (Stiglitz, Greenwald, 2003; Petrocelli, 2011).
variable to the next, you continue to determine a (subjective) causal-effect correlation (not necessarily true), based on very few relations only by using linear thinking, modelling the reality on your way of thinking, obtaining very big mistakes. It is the phenomenon of the famous metaphor of Alfred Korzybski (1931): “the map is not the territory”: our representation of the world is personal, subjective, limited, but for us it is the real world, and we act as it is. But it is not, so if we do not extend our map we usually fail in our suppositions and analysis.

By using a simulation, we can correctly connect many of the known variables, considering most of the strong and weak relations among them; you can extend your map and consider secondary interactions, in particular if you are facing human or social strategic behaviors. This means starting to think also in a lateral way, considering the system both as the addition of its parts and as a whole.

We use simulation when we want to increase learners’ performance inside complex social systems and the speed of their own response in case of unexpected events (in business it is useful to manage crisis in advance, for example).

Design a simulation or a game is always the output of a well-selected team of specialist (according to Feldstein and Neal composed by almost five figures: subject-matter experts, instructional designers, developers, graphic designers, multimedia specialists. See Feldstein, Neal, 2006).

That is in Guglielmo Marconi University where simulations are the result of different minds and different techniques. Engineers, software developers, instructional and graphic designers, teachers and subject experts have to put their minds together and try to find out a way to make students understand concepts, variables and links among them, while enjoying themselves. In other words, they have to find new but realizable ways of looking at the world outside, using different models and experimenting with them.

The first simulation we developed several years ago was the one in Macroeconomics. It is strictly linked to parts of the course in Economy Policy. In this simulation, students find the economic context as it is presented in the lessons. However, here they have to learn how to use variables and understand links between them in detail as well as having a very amusing and formative experience. It is a real role-play where students are asked to be the Prime Minister of a country. They have to make economic choices to ensure the balance among family interests, companies, employers as well as respecting the expectation of the international financial system in terms of debt and deficit sustainability. The student can choose among a set of prepared scenarios (with different levels) and a casual one, which is the result of a random system generation. In his four-year mandate, the student/Prime Minister can make decisions in terms of public expenditure, general and labor taxation, social transfers and monetary politics. The student has the “Cabinet” at his disposal, where each Minister can give him suggestions, information, data and some theoretical contents that will be useful to understand how variables work together. At the end of the five-year term, the student is evaluated on the general level of effectiveness of his actions and on the results achieved in terms of satisfaction of the different stakeholders. He also can see the results of his year-by-year trend.

In simulations like this, you can find all the aspect seen before:
• contents are primary given by Non Playing Characters (the “Cabinet”) inside the context of the game
• learners can experiment in a real life situation the use of theories and concepts;
• there are several different variables and behavior, so the students have to consider the consequences of their decisions in an holistic way
• there are different levels, so the students can choose the one that fits better to their skill level, choosing higher levels when their expertise rises up, making them remain in the “flow state” of Csikszentmihalyi
• there are also random levels, so it is possible to explore unknown and very hypothetical situation, never having the same scenario, increasing the challenge if the skills are at the top
• the game provides frequent feedbacks, one at the end of any turn of game.

**Social Effect of Serious Games: our New Simulation About Logistic System and the Development of the Value of Collaboration**

Our last simulation try to give a benefit in term of development of behavior based on collaboration. Some considerations about the possibility to use simulations and games to obtain social behavior by students: an interesting aspect is the relation between the nature of simulation and its social effects. It means that activities from a video game are translated into activities outside of the game environment, in the social real life (Kapp, 2012). Experiments demonstrated that prosocial activities within the game (for example games in which you have to save or help someone else) would encourage prosocial activities in the real world, making people more oriented to help the others in different contexts. According to the experiments of Greitemeyer and Osswald:

Experiment (...) illuminated a mediating mechanism. (...) Revealing that the effects of violent media on aggressive behavior are mediated by differences in the accessibility of aggressive thoughts, the experiment shows that the activation of prosocial thoughts elicits prosocial behavior. Thus, it appears that the effect of playing prosocial video games on prosocial behavior works primarily through the cognitive route of the GLM (Osswald, Greitemeyer, 2010).

13 Greitemeyer and Osswald conducted four separate experiments to test the relationship between prosocial video games and helping behavior. After first and second experiments, a researcher make a cup of pencils fall off a table into the floor. Of those who played the prosocial game, 67% helped the researcher, while only 33% of those who had played to neutral game and 28% of those who played the no-social game helped. In the third experiment, the participants played a more complex prosocial game and a neutral one. It was a more stressing test. A man entered the room and pretended to be the ex-boyfriend of one of the female researchers, stressing the female researcher by shouting, kicking a trashcan, and attempting to pull her out of the room. Again, those who had played the prosocial video game were more likely to help than those who had not (56% of the prosocial game players versus 22% of the other game player). In Experiment 4, the participants were asked to write down all the thoughts that they had while playing the game. It was found that those who played the prosocial game wrote down more prosocial thoughts compared to those who played the neutral game (Osswald, Greitemeyer, 2010).

14 GLM stands for General Learning Model which proposes that input variables (personal and situational) affect a person’s internal states (cognition, affect, and arousal) that guide the person’s responses. GLM proposes that the kind of associations that are activated by a video game depends on the content of the game played (Osswald, Greitemeyer, 2010).
Also extending the research in a very wide international context, to people of different ages, a
group of researchers from around the world found that video games in which characters help
and support each other in non-violent ways increase both short-term and long-term prosocial
behaviors (Gentile, et al. 2009). This means that with simulations we can convey more than contents, but also attitude to
cooperate and to have prosocial ideas and proactive projects. Researches shows also that the
prosocial effect is not exactly correlated to the activities within the prosocial game. In the social
dimension, furthermore, researches demonstrate that using simulations and serious games, it is
possible to reduce personal bias and prejudices, helping to understand relations and conflicts
inside groups or classes changing their point of view. Games and simulation can be also a
good way to favorite the cooperation within a group, more than competition (Bozarth, 2013).
Following these paths, at Guglielmo Marconi we realized a recent simulation about the Logistic
System Management. The serious game is dedicated to enhancement, optimization, and
development of a logistic system in a firm. The fact is that the success of the company not only
depends on single initiatives but of coordinated actions of team members. If anyone is only
focused on their own goals and activities, they will surely fail as a group.
In the game, each team is made of four main roles of a typical industrial logistic system:

- the Purchasing Manager decides the raw material to use in production
determining the level and the quality of the supply and staff incentives
- the Production Manager decides how much to produce the resources and
technology to use. He or she can adopt a conservative or aggressive strategy.
He or she also decides about quality of products
- the Warehouse Manager selects the input and output policy of the Warehouse
- the Sales and Marketing Manager decides the Marketing policies that can be
conservative or aggressive, and inspired to a push or pull logic.

In order to have a high evaluation (and high results for the firm) your choices have to be
coordinated and aimed to the same objectives. For this reason during the game, you can regularly
communicate with other players, using a chat and negotiate the best strategy for the company.
After 5 years, you and your team are evaluated according to the satisfaction of the stakeholders.
In particular, you will be evaluated on:

- Income statement: incomes have to be maximized as much as possible
- Customer loyalty: depending on product quality, as well as respecting delivering
times
- Efficiency of the production line and coherence in selling, purchasing, production,
warehouse management

15 It means to learn to Stand in the other’s shoes. In a peculiar research, researchers examined the role of experience, religion,
and political affiliation in learning to resolve a conflict through a video game called PeaceMaker, which simulates the Israeli-
Palestinian conflict by modeling the factors contributing to it. Students played several rounds of PeaceMaker and responded to
questions about their religious and political beliefs. According to the authors “The understanding of the conflict that is provided by
the game simulation combined with practice may make it possible to reduce personal bias and learn to stand in another’s shoes
when engaging in conflict resolution exercises” (Gonzalez, Saner, Eisenberg, 2012).
Risk management and minimization of risk.

You and your playing partners have to be aware of the risk factors, about particular damaging choices. For example, you must know that if the product manager prefers to contain costs, this can create deterioration in the relationship with suppliers. If the production manager reduce staff incentives as well as keep production intensity low can obtain a crisis in the relationship with trade unions. If customer loyalty were neglected in presence of a high price policy, it can increase the risk of fall in income.

Furthermore, the different roles can be played by physical learners or by simulators. It is also possible to define the strategy of those simulators or have random behaviors.

After the evaluation you can compare your results with the one reached by other teams.

This simulation (as others developed by Guglielmo Marconi University) can be used (personalized) in high educational courses, but also for the business, in any firm, in any industry, anywhere you want to develop the collaboration propensity and the holistic thought.

**RESULTS: DOES THE TEACHING STRATEGY WORK? CONCLUSIONS**

We can try to analyze these innovative courses, comparing them with similar courses, also taken in the equivalent matters, in the same University, evaluating effects on student’s results and motivation.

On the quantitative side, we can try to analyze the students’ results in the last academic year, comparing innovative classes in Economics (experimenting the use of simulations and new contents in teaching) with traditional courses.

First evidence: inside innovative courses the 68,3% of students passed their exam, against only the 40,7% of traditional ones.

It means that these tools can make students understand better all the concepts and the tools. That because they are more motivated to learn than by using traditional approach, and they can experiment in their real life what they are studying.
Also talking about the marks, we can note that in innovative classes there are higher levels of top performer than in traditional ones (11.7% against the 9.7%). In addition, in our innovative course, the 68% of students gets a medium or high mark. In the traditional courses only the 41%. The following figure shows the comparison.

**Results at exam**

Figure 2. Students' results
Next step will be to understand the qualitative aspect of this result. We are doing it by carrying out a survey among students to understand the use of tools and the way those tools can help them when they study. In this way, we can also better calibrate our teaching/learning tools to speak the same language of our students.
At the end, disagreeing with the Thomas Russell’s sentence about the *No significant difference phenomenon*, we can argue that the use of some media and innovative interactive teaching/learning tools, provided in the context of a different teaching philosophy, makes a very significant difference, after all.
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