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A banner image showing a close-up of a modern building's glass and steel structure, with a warm orange glow on the left and a cool blue glow on the right.

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**SEVILLE (SPAIN)  
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# SELF-ORGANIZED SCHOOLS FOR INNOVATIVE LEARNING ENVIRONMENTS

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## Abstract

According to recent research from the Oecd, Innovative Learning Environments are the key success factors of 21st century school. The inadequacy of traditional education to meet society's transformation based on knowledge, fast ICT development and the growing availability and importance in young peoples' lives, together with the spread of on-line learning have given the school new challenges. The key to success for the implementation of these environments is the school organization, position on which the two main research streams on school converge, the School Effectiveness and the School Improvement movements, that have characterized the debate in the school in the last 35 years. What are the factors that make a learning environment innovative? Is it possible to measure them? How could innovative learning environments be fostered from an organizational point of view? Can self-organization perspective be an alternative to the top-down approach to school? What are the capabilities of the self-organized school? What is the relationship between self-organized capabilities and learning environments? This work attempts to answer to these questions through literature review on innovative learning environments and self-organizing schools, the study of the international best practices and multiple case study analysis of Italian best practices. The contributions of this work are: a) a framework that identifies the key variables of innovative learning environments; b) an assessment tool concerning innovative learning environments measuring the variables through a system of indicators; c) a framework that identifies the typical capabilities of self-organized schools; and d) a tool concerning the framework that measures the capabilities. The comparison between the results obtained with the two assessment tools allows to observe that the capabilities of the self-organised school are connected to innovative learning environments. However, the capabilities have a different weight in the environments. These results suggest and define policies on the organizational aspects of school in order to improve learning.

Keywords: Innovative Learning Environments, Self-Organization, School Organization, Complexity.

## 1 INTRODUCTION

Today's school must face a number of challenges: from the inadequacy of traditional education approaches to meet the transformations that the Oecd countries have experienced passing from an industry-based to a knowledge-based society; fast ICT development and the growing availability and importance in young peoples' lives are moving the edges of educational possibilities increasing the value of informal learning, in any space and time [1]; the spread of on-line learning, homeschooling, and self-organized learning environments [2], often very effective. These phenomena put the school system in front of unusual challenges, more specifically the single school, that in the future scenarios [3] looks more and more autonomous and accountable of its results, more open to the environment and the community, more inclusive and oriented towards each student's skills/competences, integrated with ICT and life-long learning, and distinguished from other schools in terms of organization, procedures and management practices, in order to achieve the same middle-term results fixed by the governmental departments. How can schools face these challenges? The self-organization (SO) theories have raised great interest in the organizations because they explain how systems can lead to new learning, innovation, and problem solving without the constant top-down intervention, and particularly in the education field, a loosely coupled system [4], where it is very difficult to achieve shared control. Key concepts like collective leadership, community of practice and collaborative management are common in the SO theory [5]. The latter can give new light as an alternative approach to the development of Innovative Learning Environments (ILE) at school. This paper will, first of all, present the results of the literature review focusing on the gaps found; second of all, it will identify the research questions and explain the rationality behind them; third of all, it will concentrate on the methodology adopted; and finally it will show the results of the research and the discussion, the conclusions, the limits and the implications for future research.

## 2 LITERATURE REVIEW

A literature review has been carried out searching for ILE, self-organized learning, school organizational models, and self-organized schools (SOS) as shown below in table 1. Since at the time of the research (2012-2013) academic literature on ILE was not much developed (21 papers of which 15 main contributions) four international best practices were added to the search.

Table 1: literature review.

	<b>Innovative Learning Environments; Self-Organized Learning:</b>	<b>School Organizational Models; Self-Organized Schools:</b>
<b>Contributions:</b>	21	25
<b>Sources:</b>	Scopus SciVerse	Scopus SciVerse & books
<b>Main Contributions:</b>	Milrad [6]; Boyd, Jackson [7]; Mason [8]; Chang, Lee [9]; Istance [10]; Louys et al. [11]; Scott et al. [12]; Westera et al. [13]; Mitra, Dangwal [2]; Williams et al. [14]; Koper et al. [15]; Casey, Evans [16]; Jonassen [17]; Laferrière et al. [18]; Oecd [19].	Weick [4]; Mintzberg [20]; Cameron, Whetten [21]; Miles, Ekholm [22]; Romei [23]; Costa [24]; Wald, Castleberry [25]; Sergiovanni [26]; Butera et al. [27]; Bush [28]; Ramboll [29]; Bower [30] [31]; Paletta [32] [33]; Bain [5] [34]; Mazzucco [35]; De Toni et al. [36]; Castoldi [37]; Allulli [38]; VALes [40]
<b>Case studies from literature:</b>	Blended Learning, Christensen (USA); School of One (NY), Home School (Worldwide Movement), Lycée Auto-géré de Paris	

The crossed analysis of literature conducted on the learning environments (LE) (table 2) shows there are 19 variables that can be categorized into four macro-dimensions: actors, organization, learning, and technology. The majority of LEs are technology-based (13), founded on students' teamwork (11), flexible use of different spaces, especially virtual (9); they have a variety of teachers, and are based on teachers' collaboration or on communities of practice (6). The variables suggested by the Oecd [19] are not sufficient to include SO and the emergence in learning. Besides there are some aspects non considered in literature that are notably present in a few international realities (e.g. flexibility in the curriculum, students' involvement in decisions about the organization of the school, individualized and personalized plans) mentioned above; lastly, from literature, there is no measurement of the variables and it is not clear how they make a LE innovative or not.

The gaps found therefore are: 1) a comprehensive organizational framework for ILE; 2) an assessment tool for such environments; 3) a comprehensive framework of the capabilities of the SOSs; 4) an assessment tool of such capabilities.

## 3 THE RESEARCH QUESTIONS

The literature review carried out and gaps found leads to the following research questions: RQ1) How can ILE's levels of innovation be assessed? It is important to answer to this question because ILE are the key success factors for the school of the 21 century [1][19], and assessing them can lead to a classification of LEs from standard to innovative allowing comparison. Every school needs to know, if concerned, where it stands in its progression towards innovation, that means above all effectiveness in learning, according to recent research on the nature of learning [1][2][14]. RQ2) How can the capabilities typical of SOSs foster ILE? It is significant to answer to the question for three reasons: a) because it seems like [10] the engine room to the implementation of these ILE are the organizations, the binding agents among students, knowledge, teachers and resources; b) because the school is a complex system due to the nature and quality of learning, the diversity of people in the process, the context, the non-linearity of the process, the lack of interdependence of the variables involved, the nature and the number of variables [39]; c) because the school is a loosely coupled system [4] so, particularly for the Italian school, top-down policies are not very successful and bottom-up approaches

are more effective: from a first overview of twenty Italian case studies (2012), innovations at school start off from single teachers and schools, from teacher and school networks, from parents and students, and so SO could be seen as an alternative key for interpreting innovation at school.

Table 2: Variables ILE from literature review.

	VARIABLES																			TOTAL
	ACTORS					ORGANISATION					LEARNING					TECHNOLOGY				
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	
CONTRIBUTIONS																				
Milrad [6]		X											X	X					X	
Boyd, Jackson [7]		X											X	X	X				X	
Ramboll [29]	X	X		X				X	X										X	
Koper et al. [15]									X									X	X	
Louys et al. [11]		X						X							X			X	X	
Scott et al. [12]		X	X		X				X									X		
Westera et al. [13]			X						X									X	X	
Chang, Lee [9]			X						X						X				X	
Istance [10]		X	X		X				X				X		X	X				
Mitra, Dangwal [2]		X		X	X	X				X						X	X	X	X	
Williams et al. [14]		X		X						X							X	X	X	
Casey, Evans [16]	X	X						X		X						X			X	
Laferrière et al. [18]		X		X						X									X	
VAlEs [40]			X	X				X				X								
Oecd [19]	X	X	X	X	X	X	X	X	X	X	X		X	X		X			X	
TOTAL	3	11	6	6	4	2	1	5	3	9	1	1	4	3	4	4	2	5	13	

1.Students 2.Groups of students 3.Teachers 4.Group of teachers / Communities of Practice 5.Tutors, coach 6.Parents & Grandparents 7.Local community 8.Learning Time 9.Class 10.Classroom & school Spaces, 11.Teaching 12.Flexible Curriculum; 13. Knowledge, competences, values; 14.Innovative didactics 15.Individualization, Personalization 16.Non formal, Informal 17.Non-predictable 18.Self-directed, Emergent 19.Information Technology for didactics

## 4 THE METHOD

The research project has followed an iterative process of literature review and empirical search, following the methodological steps of the case study analysis in Operations Management as suggested by Voss et al. [41]. For both research questions a multiple case study analysis was accomplished for exploration & theory building. For RQ1, specifically, the variables analyzed were actors, organization, learning and technology as arisen from literature review (table 2) and 20 case



studies were compared: the latter were suggested by key informants (e.g. Italian National Education Office -Miur-, National School Evaluation Board -Invalsi-, National Teaching Innovation Office -Indire-) as to be innovative in the terms outlined by the Oecd [10]. The majority of the LE explored are schools (17), one of which is a boarding school, a museum and two non-profit associations; most of them are state schools (15), and there are two private institutes; the secondary school was most recommended (22), but one should distinguish between lower (7) and higher (15) secondary school, compared to primary and kindergarten (15). The majority of LE are situated in North Italy (13), part of them in South Italy (4), and a minority in Central Italy (2). The research instruments adopted were literature review; semi-structured and multi-phase interviews to headmasters, vices, heads of projects, teachers, and personnel; personal observation; internal (e.g. school site, balance sheet) and external (e.g. education office) documents. Concerning RQ2, the variables examined were redundancy, sharing, re-configuration, and interconnection (definitions are found below) and in order to compare the capabilities, four schools with different results in RQ1 (low, medium, medium-high, high) were chosen of the same school level (secondary school, age 14-19). The research instruments employed in this second research question were literature review, structured interviews through a 40 item-questionnaire to headmasters, vices, heads of projects, teachers, and personnel.

## 5 RESULTS AND DISCUSSION

Regarding RQ1, “how can ILE’s levels of innovation be assessed?”, the first two results are the ILE framework and the assessment tool (summarized in Fig. 1) organized into four macro variables (actors, organization, learning and technology), and more comprehensive: 21 micro-variables drawn from literature review (as shown in table 2 above), international and Italian best practices. This tool considers the assessment of any LE, whether innovative i.e. a best practice, less innovative or standard, with a score that ranges from 1 (standard) to 5 (innovative): the values from 2 to 4 are LE that are on the way to innovation. The 1 to 5 score system is typical of the Likert scales and of the quality assessment tools (e.g. EFQM). The 21 micro-variables are measured through a structured questionnaire of which 12 variables are numerical (i.e. the score is given according to the choice of the interviewees, e.g. 0, 25%, 50%, 75%, 100% of students’ teamwork), and 9 have, overall, a total of 49 items (i.e. that lead to yes/no answer, and so to a score): both the former and the latter result in a 1-5 score.

The third result was the ILE profile of 20 schools both in terms of micro-variables and macro-variables but for comparison purposes 4 schools are shown below (Fig. 2). As we can see, case study A stands out for technology, personalized learning and flexible organization whereas it is quite standard in terms of actors; case study B is medium for learning, organization and actors but even, with a low profile in technology; case study C has a medium-low profile in organization, learning and technology with standard actors; case study D has a low profile almost in all macro-variables. The graphs in Fig. 2 do not show a big difference among the case studies for the variable “actors”, that is there is not a great variety of learning actors: the value for B stands out but it is only about 2.5, D and C have similar values, just over standard, whereas A, that overall turns out to be the most innovative, has a lower value (2). So “actors” is important for three case studies but is not crucial for A. However, compared to the relative literature and to the international case studies, it is desirable to invest in the multiplicity of actors in terms of students and groups of students, teachers and groups of teachers, communities of practice, tutoring, and family and community involvement. The “organization of learning” shows values more consistent with the comprehensive values of the single case studies: D reveals a more rigid organization (1) compared to C (close to 2); B is about 2.5 and A is above 3 and so is more flexible. Especially for A, B, and C in order to have a more innovative LE, that is more effective according to research on learning [1] [19], it is suggested more flexibility of learning time, class, and space; of teaching and curriculum, and students’ involvement in the organization of school. The data for “learning” have a similar trend: especially for D and C more attention should be paid to a competence-based teaching, to innovative teaching methods that allow individualization and personalization, to the turnover and mix of non formal and informal learning together with formal learning, and to the students’ involvement in the process, modes and object of learning. The results for technology tell a low profile (1) for D, medium-low for (2) C and B, whereas A stands out as a best practice with 5. Although the role of technology in learning performances is not clear [5][34][19][42], the importance of it as a facilitator and strengthener is crucial if learning is central [42].



Figure 1: the ILE framework and assessment tool.

Regarding RQ2, “How can the SO capabilities of schools foster ILE?”, literature review on SOS highlights the lack of some dimensions that are present in SO theory and in some Italian case studies, that is why we will begin with a broader model in which the dimensions arisen from literature and case studies can flow in. Moreover there is not a measure of the aspects considered. De Toni et al. [36] have identified, among the organization models that take advantage of SO in companies, four specifically: the cellular or spherical organization [43][44], the circular organization [45][46], the holonic organization [47] and the hologramatic organization [48]. In these organizations De Toni et al. have searched the main capabilities that characterize them: 1) redundance, typical of hologramatic organizations, is the surplus of intangible resources (cognitive, functional, informational, and relational) for the capability to respond to the environmental solicitations; 2) interconnection, typical of circular organizations, is the capability to create networks that take advantage of the small world effect; 3) sharing, typical of cellular organization, is the capability to put together values and vision; 4) re-configuration, typical of holonic organizations, is the capability to re-configure in co-evolution with the environment [36]. If we match the above dimensions, the variables of the SOSs from literature [5][30][31][34] and the case studies explored we will get to the framework of the capabilities typical of the SOS (Fig. 3) , which is the first result for this research question.

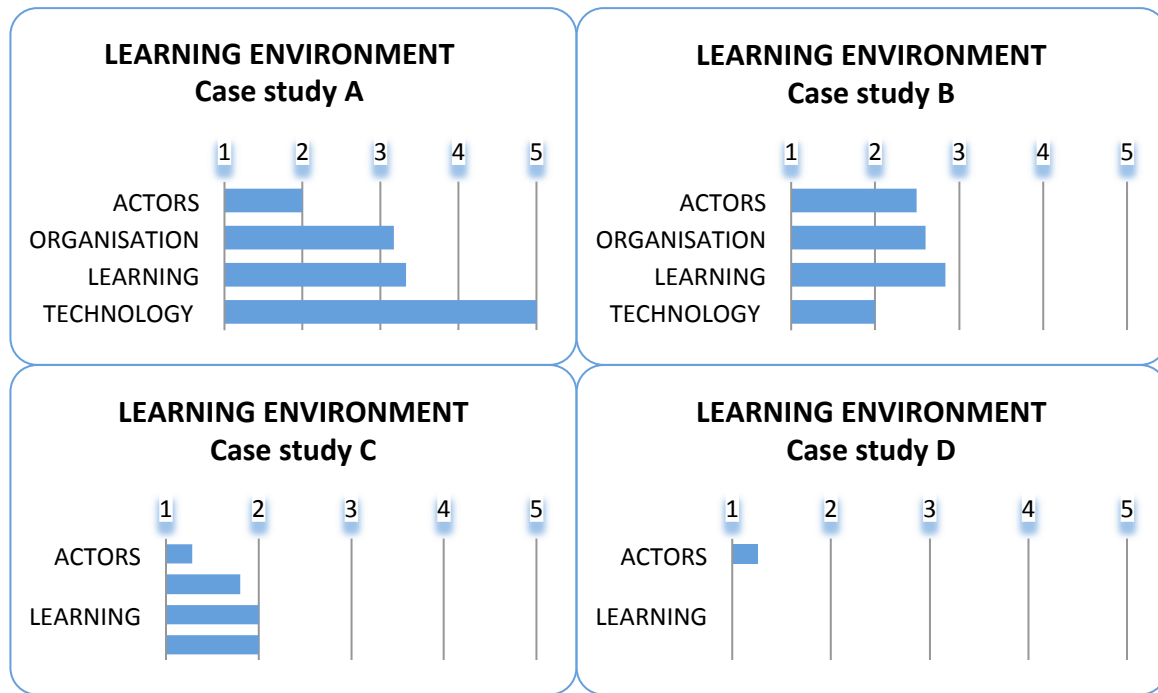


Figure 2: the ILE profile of 4 schools (macrovariables).

Each capability can then be divided and put into effect in the following managerial practices, according to literature:

1. Redundance, in job enlargement and job enrichment. For job enlargement at school, we mean the extension of the teacher's role in a horizontal way, from the teaching-learning phase to other phases of the learning process, i.e. from planning to self-evaluation; from learning space, human resources to technology management and development. For job enrichment we mean the extension of the teacher's role in a vertical way, with more functions in the same phase [31][34].
2. Interconnection, in shared control (empowerment), collegiality, teacher-student cooperation and in stakeholders' relationships, through feedback loops [20][26][5][29][31][19][49].
3. Sharing, in a vision, in values, in organizational culture [39][50][51][25][26][29][31][5][53][19].
4. Re-configuration, through school networks, partnerships, and monitoring of the research on ILE. The internal and external dialogue and feedback allow the SOS to update continuously and therefore to adapt to the external environment [31].

The second result is the assessment tool, that is a 40 item-questionnaire drawn from literature on capabilities and adapted to the school, and divided into ten questions for each capability examined. The third result is the relationship between LEs and capabilities, as we can see from Fig. 4, below. The comparison between the results obtained with the two assessment tools allows us to observe that the capabilities of the SOS are connected to ILEs. Overall the case studies range over a line that goes from standard to innovative LE and from the lowest to the highest in the capabilities of the SOSs. So we can infer the first proposition: 1) the more self-organized the school is, the more innovative the learning environment is. However, capabilities have a different weight. Sharing of vision, values, and culture is a key variable in enhancing ILEs, and so: 2) the more shared the values, the vision and the culture are, the more innovative the LE is (Figure 5). Interconnection, redundance, and re-configuration are likely to enhance ILE but are not determinant (3 out of 4 case studies), thus: 3) the more interconnected the school is, the more innovative the LE is likely to be; 4) the more "redundant" the school is, the more innovative the LE is likely to be; 5) the more re-configured the school is, the more innovative the LE is likely to be (Figure 5).



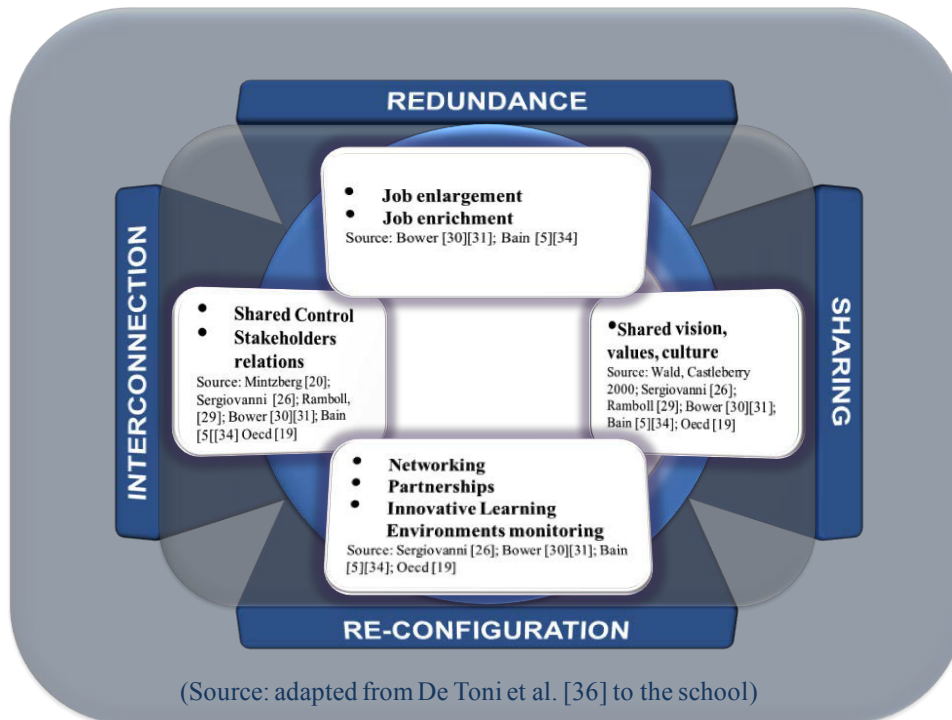


Figure 3: the framework of the capabilities of the SOS.

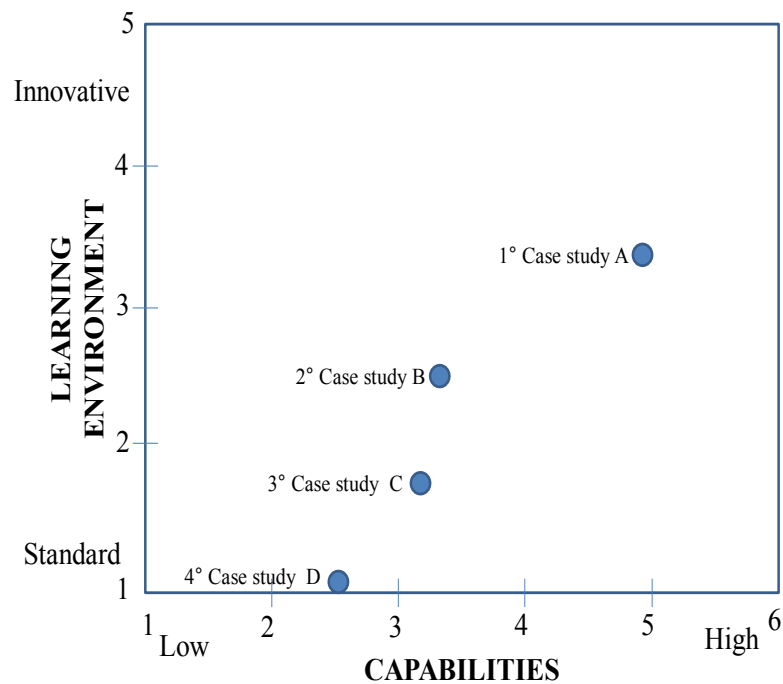


Figure 4: the relationships between LE and capabilities.

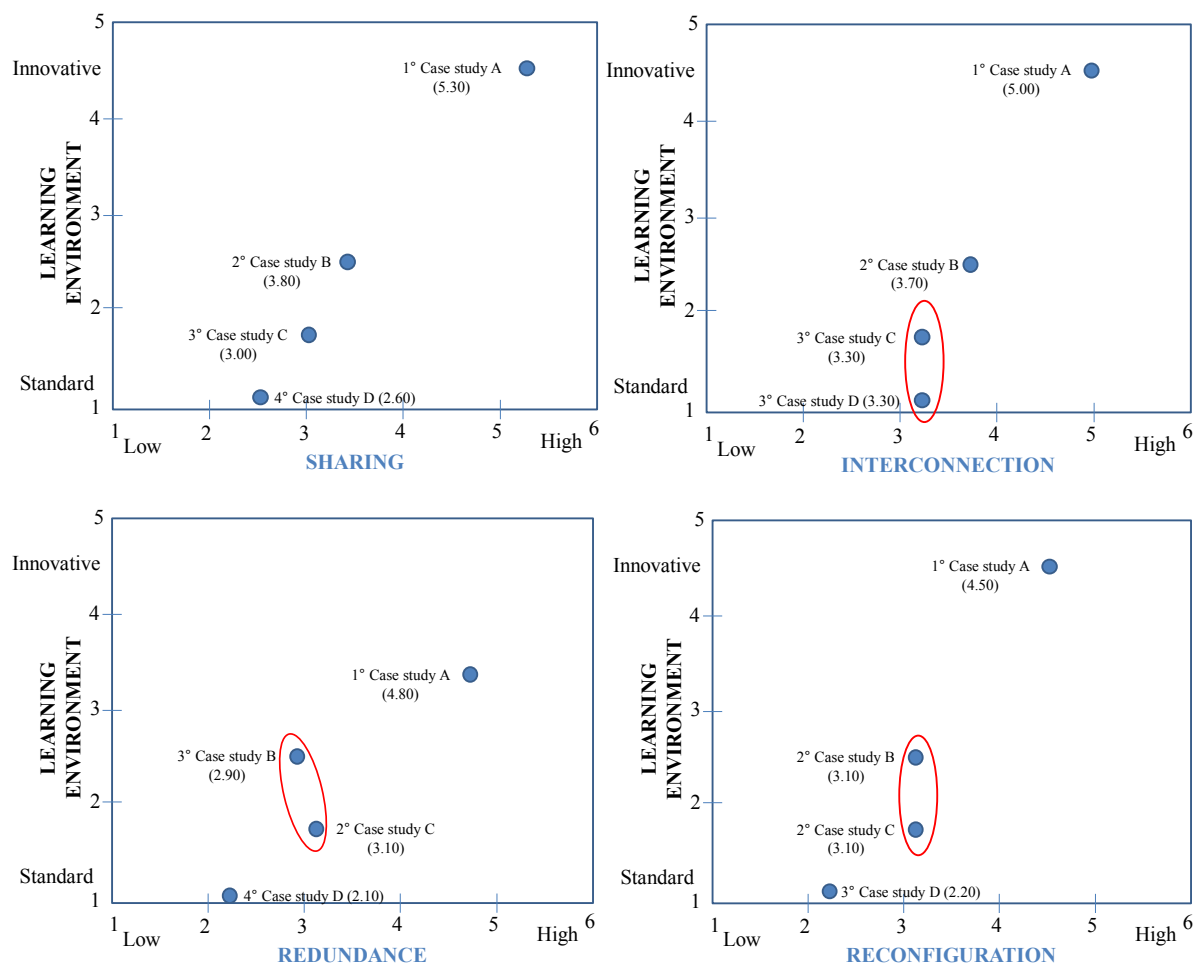


Figure 5: the capabilities typical of SOSs - results.

## 6 CONCLUSIONS

The scientific contributions of this work are 1) a framework and an assessment tool for ILE that can be applied specifically to schools and to other LEs close to school e.g. museums or associations that work with the school for drop-out risk with the specific particular constraints of the single cases; 2) a framework & an assessment tool for the analysis and measurement of the capabilities typical of the SOSs. The former and the latter are a step forward in the debate on ILE and on the analysis of the capabilities of the SOSs. There are policy contributions in terms of the correlations between the capabilities typical of the SOS and ILE; however capabilities have a different weight: sharing is a key capability: interconnection, reconfiguration, and redundance are less determinant. Among the limits of this research: 1) for comparison reasons, four case studies with high, medium-high, medium-low, and low results in ILE have been examined for the capabilities, and this research could be extended to the 20 schools analyzed for ILE, and be followed by a survey on a larger sample, possibly at a national level; 2) a further analysis of the relationships between ILE and learning results (e.g. Oecd-Pisa) will be necessary to be carried out; 3) a refinement of the ILE's assessment tool may be needed, differentiating more specifically primary and secondary school.

## REFERENCES

- [1] OECD (2010). The Nature of Learning: Using Research to inspire practice. Educational Research and Innovation, OECD Publishing: 3-31.
- [2] Mitra, S., Dangwal, R. (2010). Limits to self-organising systems of learning—the Kalikuppam experiment. British Journal of Educational Technology, 41(5): 672-688.
- [3] OECD (2001). What schools for the future. Educational Research and Innovation, OECD Publishing: 77-98, 231-242.

- [4] Weick, K. E. (1976), Educational organizations as loosely coupled systems. *Administrative science quarterly*, 1-19.
- [5] Bain A. (2007). *The Self-Organizing School: Next-Generation Comprehensive School Reforms*. R&L Education.
- [6] Milrad, M. (2002). Using construction kits, modeling tools and system dynamics simulations to support collaborative discovery learning. *Educational Technology & Society*, 5(4), 76-87.
- [7] Boyd, A. M., & Jackson, M. L. (2004). An effective model for rapid skills acquisition through a simulation-based integrated learning environment. *Journal of Educational Computing Research*, 30(1), 1-21.
- [8] Mason, L. (2006). *Psicologia dell'apprendimento e dell'istruzione*. Il Mulino, Bologna 2006.
- [9] Chang, C. Y., & Lee, G. (2010). A Major E-Learning Project to Renovate Science Learning Environment in Taiwan. *Turkish Online Journal of Educational Technology-TOJET*, 9 (1), 7-12.
- [10] Istance, D. (2010). A New International OECD Project on Learning: "Innovative Learning Environments". *International Journal of Learning*, 16(12), 479-485.
- [11] Louys, A., Leo, D. H., Schoonenboom, J., Lemmers, R., & Pérez-Sanagustín, M. (2009). Self-Development of Competences for Social Inclusion Using the TENCompetence Infrastructure. *Educational Technology & Society*, 12(3), 70-81.
- [12] Scott, G.P. (1991). *Time, rhythm, and chaos: In the new dialog with nature*. Ames, Iowa State University Press.
- [13] Westera, W., de Bakker, G., Wagemans, L. (2009). Self-arrangement of fleeting student pairs: A web 2.0 approach for peer tutoring. *Interactive Learning Environments* 17 (4), pp. 341-349.
- [14] Williams, R., Karousou, R., & Mackness, J. (2011). Emergent learning and learning ecologies in Web 2.0. *The International Review of Research in Open and Distance Learning*, 12(3), 39-59.
- [15] Koper, R., Giesbers, B., Van Rosmalen, P., Sloep, P., Van Bruggen, J., Tattersall, C., Brouns, F. (2005). A design model for lifelong learning networks. *Interactive Learning Environments*, 13(1-2), 71-92.
- [16] Casey, G., Evans, T. (2011). Designing for learning: Online social networks as a classroom environment. *International Review of Research in Open and Distance Learning* 12 (7 SPECIAL ISSUE), pp. 1-26.
- [17] Jonassen, D.H, Peck K.L., Wilson G.B. (1999). *Learning with technology. A constructivist perspective*. Merrill.
- [18] Laferriere, T., Law, N., & Montané, M. (2012). An international knowledge building network for sustainable curriculum and pedagogical innovation. *Int. Education Studies*, 5(3), 148-160.
- [19] OECD (2013). *Innovative Learning Environments*. Educational Research and Innovation, OECD Publishing.
- [20] Mintzberg, H. (1983). *Structure in Fives. Designing effective organizations*. Englewood Cliffs, Prentice-Hall.
- [21] Cameron, K.S., Whetten, D.A. (Eds.) (1983). *Organizational effectiveness. A comparison of multiple models*. Academic Press, New York.
- [22] Miles M.B., Ekholm M. (1985). What is School Improvement? in Velzen, W. van et al. *Making school improvement work*, ACOO, Leuven, pp. 33-67.
- [23] Romei, P., & Bonfiglioli, R. (1993). *La scuola come organizzazione: testo e casi*. Franco Angeli.
- [24] Costa M. (1999). *Dirigere la scuola dell'autonomia*. ISEDI, Torino.
- [25] Wald, P. J., & Castleberry, M. S. (2000). *Educators as learners: Creating a professional learning community in your school*. ASCD.
- [26] Sergiovanni T.J. (2001). *The principalship. A reflective practice perspective*. Allyn and Bacon.
- [27] Butera, F., Coppola B., Fasulo A., Nunziata E. et al. (2002). *Organizzare le scuole nella società della conoscenza*. Carocci editore.

- [28] Bush T. (2003). Theories of educational management: third edition. London: Sage.
- [29] Ramboll Management (2004). Study on Innovative Learning Environments in School Education. European Commission DG Education and Culture.
- [30] Bower, D. F. (2003). Leadership and the self-organizing school. University of New Mexico.
- [31] Bower, D. F. (2006). Sustaining school improvement. *Complicity: An International Journal of Complexity and Education*, 3(1).
- [32] Paletta A. (2007). Prime riflessioni sugli aspetti organizzativi della scuola italiana. *Ricerca Invalsi*.
- [33] Paletta A. (2011). Scuole responsabili dei risultati: accountability e bilancio sociale. Il Mulino, Bologna.
- [34] Bain, A., Walker, A., & Chan, A. (2011), Self-organisation and capacity building: sustaining the change, *Journal of Educational Administration*, 49(6), 701-719.
- [35] Mazzucco C. 2010. Coltivare comunità nella scuola. Lecce: Pensa
- [36] De Toni, A. F., Comello, L., Ioan, L. (2011). Auto-organizzazioni: Il mistero dell'emergenza nei sistemi fisici, biologici e sociali. Marsilio Editori.
- [37] Castoldi, M. (2012). Valutare a scuola. Dagli apprendimenti alla valutazione di sistemi. Carocci editore.
- [38] Allulli, G., Farinelli, F., & Petrolino, A. (2013). L'autovalutazione di istituto: modelli e strumenti operativi con moduli e questionari disponibili online. Guerini e associati.
- [39] Comoglio M. (2002). Preface to the Italian edition of Sergiovanni T.J., The principalship. A reflective practice perspective. *Dirigere la scuola comunità che apprende*. LAS, Roma.
- [40] VALes (2012-2015). Valutazione e sviluppo della scuola. Invalsi.
- [41] Voss C., Tisikriktis N., Frohlich M. (2002). Case research in operations management. *International Journal of Operations & Production Management*, 22(2), pp. 195-219.
- [42] Mayer, R.E. (2010). "Learning with technology" in *The Nature of Learning: Using Research to Inspire Practice*. OECD Publishing.
- [43] Miles, R. E., & Snow, C. C. (1995). The new network firm: A spherical structure built on a human investment philosophy. *Organizational dynamics*, 23(4), 5-18.
- [44] Miles, R. E., Snow, C. S., Mathews, J. A., Miles, G., & Coleman, H. J. (1997). Organizing in the knowledge age: Anticipating the cellular form. *The Academy of Management Executive*, 11(4), 7-20).
- [45] Mintzberg, H. (1995). Musings on management. Ten ideas designed to rile everyone who cares about management. *Harvard business review*, 74(4), 61-67.
- [46] Ackoff, R. L. (1989). The circular organization: an update. *The Academy of Management Executive*, 3(1), 11-16.
- [47] McHugh, P., Merli, G., & Wheeler III, A. (1995). *Beyond Business Process Reengineering—Towards the Holonic Enterprise*, Chichester, Wiley, 1995.
- [48] Morgan, G. (1986). *Images of organization*. Beverly Hills: Sage Publications.
- [49] Paletta A. (2011). Scuole responsabili dei risultati: accountability e bilancio sociale. Il Mulino, Bologna.
- [50] DuFour, R., & Eaker, R. (1998). Professional learning communities at work: Best practices for enhancing student achievement. National Educational Service, Bloomington.
- [51] DuFour, R., DuFour, R., Eaker, R., & Many, T. (2006). *Learning by doing. A handbook for professional learning Communities at work*. Solution Tree. Bloomington.
- [52] Gleick, J. (1997). *Chaos: Making a new science*. Penguin: New York.
- [53] Merry, U., & Kassavin, N. (1995). *Coping with uncertainty: Insights from the new sciences of chaos, self-organization, and complexity*. Praeger Publishers/Greenwood Publishing Group.