

CURRICULUM REDESIGN AS A DRIVER OF SCHOOL INNOVATION: EVIDENCE FROM AN ITALIAN LOWER SECONDARY SCHOOL

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Abstract

Lower secondary education is often characterized by strong disciplinary fragmentation, which may lead to superficial learning and cognitive overload for students [10]. Indeed, excessive information and poorly structured knowledge can reduce their capacity to develop meaningful understanding [11]. Several education systems, such as Portugal, have recently undertaken curriculum reforms aimed at identifying essential knowledge and transversal competencies [9]. In Italy, national curriculum guidelines emphasize competence-based education and the identification of core disciplinary concepts [7]. However, lower secondary education still tends to be characterized by extensive content coverage and limited integration between disciplines [2]. This paper explores how curriculum restructuring around core disciplinary concepts can act as a driver of educational innovation within this context.

This research forms part of a broader doctoral project investigating how educational leadership can support school success in Italian comprehensive institutes. The study adopts a mixed-method case-study approach, with a qualitative focus, within the framework of the International Successful School Principalship Project (ISSPP) [5]. The conceptual framework integrates Bronfenbrenner's ecological systems theory [4] with complexity theory [8] to analyse how innovation emerges from interactions between actors and contextual factors across multiple levels. The case study was conducted in a comprehensive institute in Northern Italy. Data collection included interviews with the principal and staff, focus groups with students and parents, teacher and headteacher surveys, and research observations of school practices. The analysis explores how organizational structures, pedagogical practices, and leadership strategies interact to support curriculum innovation.

Findings indicate that redesigning the lower secondary curriculum around core disciplinary concepts enabled teachers to prioritize essential knowledge and reduce the fragmentation typical of subject-based teaching. This restructuring was accompanied by several organizational innovations, including the use of subject-based classrooms, the integration of tablets as learning tools, and collaborative work within subject departments to produce shared teaching materials. Curriculum prioritization allowed teachers to dedicate more time to practice-oriented activities such as collaborative work and authentic tasks, and to design learning experiences connected to real-world issues. By "pruning" non-essential content, the school created space for differentiated instruction, manual and creative activities, and initiatives aimed at fostering student wellbeing and social development. This approach contributed to a learning environment that values both cognitive and human dimensions of education.

The case study illustrates how curriculum redesign can function as a key lever for educational innovation. Focusing on core disciplinary concepts reduces cognitive overload and supports deeper learning, while also enabling experiential learning and more flexible pedagogical approaches. Within constrained education systems, curriculum prioritization may therefore represent a promising pathway for improving both student engagement and the overall quality of learning experiences.

Keywords: School innovation, Italian lower secondary school, Italian comprehensive institutes, ISSPP, successful principalship, school leadership.

1 INTRODUCTION

Lower secondary education is frequently characterized by extensive curricular coverage and strong disciplinary fragmentation, conditions that may hinder meaningful learning and reduce students' engagement with knowledge. OECD analyses have highlighted how overloaded curricula often privilege breadth over depth, limiting opportunities for conceptual understanding, inquiry-based learning, and authentic educational experiences [10]. Within highly content-driven systems, students may be exposed to large quantities of fragmented information that are difficult to integrate into coherent cognitive structures.

These concerns are further supported by Cognitive Load Theory (CLT), which argues that learning is constrained by the limited capacity of working memory when processing new information [11]. Learning becomes less effective when students are required to manage excessive, fragmented, or poorly organized content simultaneously, as cognitive resources become overloaded before stable understanding can be constructed. In such conditions, students may struggle to identify conceptual connections, integrate new knowledge with prior learning, and develop coherent mental schemas. Within CLT, intrinsic cognitive load refers to the inherent complexity of the material being learned, whereas extraneous cognitive load derives from the way information and learning activities are designed and presented. Poorly sequenced explanations, redundant information, and fragmented instructional structures may therefore generate unnecessary cognitive demands that interfere with learning processes. More recent developments of CLT conceptualize germane cognitive processes not as a separate type of load, but as the productive cognitive effort that students can devote to schema construction and meaningful understanding once useless extraneous load has been reduced [11], [12]. In this sense, reducing cognitive overload allows learners to allocate greater cognitive resources to conceptual integration, knowledge consolidation, and transferable understanding.

Although CLT originally emerged within the field of instructional design and focused primarily on specific learning tasks, its underlying principles also offer useful insights for broader reflections on curriculum organization. From this perspective, highly fragmented and encyclopedic curricula may increase unnecessary cognitive demands by exposing students to excessive quantities of disconnected content within limited instructional time. Such conditions may hinder opportunities for conceptual consolidation and meaningful learning. Conversely, curriculum redesign around core disciplinary concepts may support more sustainable learning processes by reducing fragmentation and creating greater space for active engagement with essential knowledge. Curriculum prioritization can therefore be interpreted not as a simplification or lowering of expectations, but as an organizational and pedagogical strategy aimed at improving the quality and transferability of learning.

In response to these challenges, several educational systems have promoted curriculum reforms centred on essential knowledge, transversal competencies, and greater curricular coherence. Portugal represents one of the most significant European examples of consistent educational improvement resulting from sustained reform efforts. At the beginning of the PISA cycle, Portuguese students performed below the OECD average; however, between 2000 and 2018, Portugal progressively improved its results in reading, mathematics, and science, becoming the only OECD country to show continuous improvement across all three domains during this period [6]. For this reason, Andreas Schleicher described Portugal as “*Europe’s biggest success story at PISA*” [6]. Importantly, this improvement has been associated not with a single reform, but with a long-term process of systemic alignment. Over time, the Portuguese educational system promoted greater curricular coherence, increased school-level flexibility, and a gradual shift from extensive content coverage toward the identification of “essential learning”. Curriculum flexibility was conceived both as a decentralization measure, and as a strategy for strengthening consistency between curriculum, teaching practices, assessment, and broader educational goals. These reforms intended to give schools greater flexibility in adapting their teaching to students’ needs, while also supporting educational quality and equity. The Portuguese experience therefore suggests that curriculum prioritization may contribute to improvement, especially when embedded within broader processes of pedagogical renewal.

Within the Italian context, the National Curriculum Guidelines for the first cycle of education formally promote competence-based education, interdisciplinary learning, and the identification of core disciplinary concepts [7]. The Guidelines explicitly encourage schools to move beyond transmissive approaches and rigid disciplinary boundaries, emphasizing meaningful learning, transversal competencies, and knowledge that can be mobilized in authentic contexts. However, the implementation of these principles within everyday lower secondary school practice often remains uneven. Despite the formal emphasis on competencies and interdisciplinarity, teaching in Italian lower secondary schools often continues to be organized around strongly separated subjects, textbook-centred instructional practices, and extensive curricular coverage [1], [10]. As a result, a gap may emerge between the intended curriculum promoted at policy level and the enacted curriculum experienced by students in classrooms. This tension reflects broader structural characteristics of the Italian school system. As highlighted by Benadusi and Giancola [2], lower secondary education tends to intensify disciplinary specialization, exposing students to a growing number of teachers, subjects, and assessment demands. In such a context, curriculum redesign around core disciplinary concepts may represent a practical strategy for reducing fragmentation and making competence-based education more actionable. By identifying essential knowledge and strengthening connections across

disciplines, schools may move beyond formal adherence to policy principles toward more substantive forms of pedagogical innovation.

Against this backdrop, the present study aims to provide empirical evidence on how curriculum redesign may function as a driver of school innovation within lower secondary education. The paper presents findings from a case study conducted in a comprehensive institute in Northern Italy, where curriculum restructuring around core disciplinary concepts activated a broader process of pedagogical and organizational innovation, by creating space for experiential, student-centred, and wellbeing-oriented educational approaches.

2 METHODOLOGY

This study adopts a single case study design within the methodological framework of the International Successful School Principalship Project (ISSPP) [5]. The research forms part of a broader doctoral project exploring how school leadership supports school success within Italian comprehensive schools. This paper specifically focuses on the role of curriculum redesign as a driver of innovation processes. Accordingly, this study addresses the following research question:

- 1 How can curriculum redesign foster school innovation within an Italian lower secondary school context?

At the time of data collection, the institute enrolled 730 students and employed 102 teachers, distributed across one kindergarten, three primary schools and one lower secondary school. The headteacher had led the school for ten years. The study employed a mixed-method approach with qualitative predominance. Data collection included interviews with the principal and teachers, focus groups with students and parents, surveys administered to staff and school leaders, document analysis, and research observations of school practices, as illustrated in Table 1. The multi-perspective design allowed the study to explore curriculum innovation through the viewpoints of different actors within the school community.

Table 1: Overview of Participants and tools

<i>Empirical Data Collected</i>	
Individual Interviews with Principal	5
Individual Interviews with Teachers	8
Focus Groups with Students	2
Individual interviews with the president/members of School Board	2
Focus Groups with Parents	1
Online Principal Survey	1
Online Staff Surveys	68
Observation and Job Shadowing	17 hours

The conceptual framework integrates Bronfenbrenner's ecological systems theory [4] and complexity theory [8] to examine how innovation emerges through interactions between organizational structures, leadership practices, pedagogical processes, and contextual factors across multiple levels of the educational system.

Qualitative data were analysed through reflexive thematic analysis [3], supported by NVivo software. Coding was conducted inductively and progressively refined through iterative analysis. Quantitative survey data were analysed descriptively and used to support triangulation across sources.

The study followed ISSPP ethical procedures and received approval from the Ethics Committee of the University of Verona. Participation was voluntary, informed consent was obtained from participants, and anonymity was ensured throughout the whole research process.

3 RESULTS

3.1 Curriculum redesign and pedagogical innovation

Findings indicate that curriculum redesign represented the main driver through which broader processes of pedagogical innovation progressively emerged within the school. The initial transformation did not originate from a formal curriculum reform, but from the introduction of subject-based classrooms, where students moved across different disciplinary spaces rather than remaining in a fixed classroom. As principal explained, this organizational change unexpectedly triggered a wider process of reflection on teaching, learning, and curriculum structure, since *“each step opened further doors that had not been initially planned or anticipated”*. The need to reduce the physical burden on students of carrying heavy schoolbags up and down multiple floors led teachers to progressively ‘lighten the schoolbag’ by experimenting with alternative materials. This practical organisational adaptation, thus, gradually evolved into a much deeper pedagogical transformation.

Over time, teachers increasingly perceived traditional textbooks as poorly aligned with the type of teaching practices they wished to develop. This led the teaching staff to collectively decide to produce alternative learning materials and to redesign the curriculum around core disciplinary concepts (*“nuclei fondanti”*). The redesign process was strongly collegial and department-based. In fact, departments collaboratively identified essential knowledge, epistemological cores, and meaningful competencies that students should develop throughout the three years of lower secondary education, according to the National Curriculum Guidelines. Teachers described this process as a deliberate attempt to “prune”, “streamline”, and reduce “cognitive overload” associated with excessive and redundant content accumulation.

This process generated significant disciplinary reconfiguration. For example, geography moved away from predominantly descriptive and mnemonic approaches toward the analysis of contemporary global and environmental issues, while grammar was redesigned through a valency- and text-based approach. The curriculum was no longer conceived as a static summative document formally uploaded to the school website, but as a dynamic and continuously updated set of shared working documents, organized through flexible learning units enriched with links, digital resources, interdisciplinary connections, and differentiated activities.

Reducing content coverage also created pedagogical space for more active and experiential forms of learning. Students repeatedly emphasized that meaningful learning requires considerably more time than traditional “explanation-study-test” instructional sequences. Consequently, curriculum prioritization enabled the expansion of collaborative work, metacognitive activities, authentic tasks, and project-based learning. The school progressively strengthened experiential and student-centred approaches, integrating cooperative learning, inquiry, manual activities, citizenship education, and reflective practices. This pedagogical shift was also reflected in assessment practices. Departments collaboratively developed shared and differentiated assessment tools focused not only on disciplinary knowledge but also on competencies and transversal skills. Learning units were intentionally structured to support metacognition, activate prior knowledge, clarify learning objectives, and promote conceptual connections across disciplines. The redesign therefore contributed to reducing fragmentation while strengthening conceptual coherence and deeper engagement with essential knowledge.

Overall, findings suggest that curriculum redesign functioned not merely as a curricular adjustment, but as a catalyst for broader pedagogical innovation. By reducing encyclopedic content coverage and prioritizing essential disciplinary concepts, the school created conditions for more sustainable, coherent, and meaningful learning processes.

3.2 Reorganization of learning environments, and student wellbeing

Curriculum redesign was accompanied by a profound reconfiguration of the school’s learning environments and educational culture. The transition toward subject-based classrooms transformed the spatial organization of the school and progressively redefined relationships between students, teachers, disciplines, and learning spaces, which increasingly functioned more as active pedagogical resources than neutral organizational settings. Traditional classroom layouts based on aligned desks and teacher-centred instruction were gradually replaced by more flexible and collaborative environments characterized by group tables, modular furniture, and thematic laboratories. Teachers themselves reported that the removal of fixed desks and even teacher desks (*“cattedre”*) emerged naturally from the evolving pedagogical approach.

The school developed a wide range of specialized environments, including laboratories for science, robotics, digital fabrication, arts, and music, alongside libraries, outdoor learning spaces, and common areas designed to foster autonomy, responsibility, and collaboration. Students moved continuously across these environments throughout the school day, contributing to a more dynamic and participatory conception of learning. Teachers emphasized that this organizational model expanded opportunities for active participation and interdisciplinary interaction while creating space for forms of learning capable of valuing different forms of intelligence and expression, including practical, creative, and manual competencies often marginalized within traditional instructional settings. Hands-on and project-based activities appeared particularly significant for students who struggled within conventional teacher-centred approaches, enabling broader participation and stronger engagement. Students themselves consistently described the school as an environment in which “*everyone could find their own space*” to express personal talents and interests.

Digital technologies represented another important dimension of this transformation, although participants consistently framed technology as a pedagogical support rather than an endpoint in itself. The school progressively reduced textbook adoption by approximately 70%, replacing many traditional materials with collaboratively produced digital and hybrid resources. Tablets were used to facilitate access to interdisciplinary resources, differentiated pathways, and collaborative activities, while maintaining strong integration with analogue practices such as handwriting, paper-based study, and practical experimentation. Both teachers and students described this approach as a form of “*double literacy*”, aimed at integrating digital and traditional learning practices rather than replacing one with the other. Importantly, tablets were not conceived as tools for passive consumption, but as instruments supporting inquiry-based learning, co-construction of knowledge, and active student participation.

Parents initially expressed concerns regarding the extensive use of tablets, particularly in relation to screen exposure and the risks associated with digital technologies. However, many families progressively reconsidered their initial scepticism after observing how devices were carefully supervised and embedded within meaningful pedagogical practices. The principal emphasized the importance of building a shared educational approach with families regarding the responsible use of digital tools. While the school guided students toward conscious and critical uses of technology within educational settings, parents were considered essential partners in supervising behaviours outside school. Consequently, the school promoted meetings and training initiatives aimed at encouraging students and families to critically reflect on both the opportunities and the risks associated with digital environments. Far from banning technology, the school adopted an approach centred on accompaniment, responsibility, and critical digital citizenship.

Findings also suggest positive effects on student wellbeing, engagement, and school climate. Internal monitoring data indicated that 93.7% of students reported liking school “very much” or “quite a lot”, a figure considerably higher than national HBSC averages. The principal and teachers associated these outcomes with the school’s emphasis on participation, authentic learning, and relational care. Collaborative and experiential forms of learning appeared to strengthen students’ sense of belonging, personal agency, and trust in teachers, while also supporting the development of transversal competencies, autonomy, and cooperative skills. Former students reportedly described the lower secondary experience as highly formative for the construction of self-confidence and personal identity.

These findings suggest that curriculum redesign generated effects extending far beyond curriculum content alone. The prioritization of essential knowledge progressively activated broader transformations involving learning environments, pedagogical practices, student participation and digital citizenship. Innovation therefore emerged as a systemic and interconnected process unfolding across pedagogical, relational, and organizational dimensions of school life.

3.3 Professional collaboration and innovation culture

A central finding concerns the role of collaborative curriculum work in strengthening the school’s professional culture. Alternative teaching materials and shared assessment practices were collectively developed within subject departments through continuous processes of experimentation, revision, and adaptation. Curriculum construction didn’t remain an individual activity: it became a structured form of collegial inquiry that progressively reshaped professional relationships and organizational routines. The principal described this process as instrumental in overcoming the “teacher-island” model often associated with lower secondary education.

Departments progressively evolved into stable spaces for pedagogical reflection, reciprocal learning, and collective responsibility. Shared materials and assessment frameworks created stronger organizational

coherence while preserving teachers' autonomy to adapt activities and resources to specific classroom contexts. In this sense, the curriculum was described by participants as a "living document", continuously revised to incorporate differentiated pathways, interdisciplinary connections, and emerging issues relevant to students' experiences and learning needs. The collaborative structure also facilitated the onboarding of new teachers by providing shared pedagogical references and reducing professional fragmentation.

Findings further suggest that leadership played a key enabling role by legitimizing experimentation, supporting collaborative structures, and creating organizational conditions for sustained professional dialogue. Educators emphasized that meetings of the teachers' council frequently focused on pedagogical reflection more than merely administrative procedures. Innovation therefore emerged less through top-down implementation than through the gradual activation of collective professional agency across the school community. Curriculum redesign functioned simultaneously as a pedagogical and organizational process, fostering organizational learning, professional trust, and shared responsibility for student learning.

4 CONCLUSIONS

This study explored how curriculum redesign centred on core disciplinary concepts can act as a catalyst for school innovation within an Italian lower secondary school context. Findings suggest that reducing curricular fragmentation and prioritizing essential knowledge did not merely reshape instructional content, but activated broader pedagogical, organizational, relational, and cultural transformations across the school community. In this sense, the reorganization of essential knowledge emerged as a systemic process capable of reshaping learning environments, professional practices, and students' educational experiences.

Consistent with OECD concerns [10] regarding curriculum overload and with the assumptions of Cognitive Load Theory [11], the case study suggests that reducing excessive and redundant content may create more favourable conditions for deep and meaningful learning. By identifying core disciplinary concepts and limiting encyclopedic coverage, teachers were able to devote greater time and cognitive space to conceptual understanding, metacognitive reflection, authentic tasks, and collaborative inquiry. The findings therefore support the idea that educational quality may depend less on the quantity of transmitted content than on the capacity of schools to construct coherent and meaningful learning pathways.

Importantly, the effects of curriculum redesign extended far beyond curriculum organization alone. The introduction of subject-based classrooms triggered a cascading process of interconnected transformations involving the redesign of learning spaces, the reconfiguration of classroom relationships, the collaborative production of alternative teaching materials, and the development of new assessment practices. Innovation unfolded through adaptive and mutually reinforcing processes in which each transformation created conditions for further developments that had not initially been anticipated. This dynamic strongly reflects the ecological [4] and complexity-informed perspective [8] adopted in the study, according to which innovation emerges through relational interactions, organizational adaptation, and collective sense-making rather than through linear implementation models.

The case further illustrates how curriculum prioritization may contribute to more inclusive and student-centred forms of education. Reducing curricular overload created space for experiential, practical, creative, and collaborative activities capable of valuing different forms of intelligence and participation, including students who often struggle within traditional transmissive and teacher-centred instructional settings. Students themselves described the school as an environment in which everyone could find opportunities to express personal talents, interests, and abilities. In this regard, the findings suggest that curriculum redesign may support not only cognitive development, but also broader dimensions of wellbeing, autonomy, participation, and school belonging. Educational innovation therefore appears closely connected to the capacity of schools to integrate academic learning with relational, emotional, and identity-related dimensions of student experience.

Another significant contribution concerns the role of professional collaboration in sustaining innovation processes. Curriculum construction evolved into an ongoing process of shared inquiry, experimentation, and collective learning within subject departments, strengthening professional interdependence and organizational coherence. From this perspective, leadership emerged as an enabling condition for innovation by fostering trust, collaboration, experimentation, and shared responsibility. Rather than operating through direct control, leadership supported collective agency while maintaining coherence between pedagogical vision, organizational structures, and professional practices.

Although limited to a single case study and therefore not statistically generalizable, the research offers meaningful empirical insights into how curriculum redesign may operate as a practical lever for educational innovation within relatively constrained educational systems such as Italy. The Portuguese experience discussed in the literature review demonstrates how sustained and coherent educational policies may progressively generate systemic improvement by strengthening curricular coherence, organizational alignment, and pedagogical continuity over time. Conversely, the Italian educational context has often been characterized by cyclical and non-linear reforms that risk producing institutional instability and limiting the consolidation of long-term innovation processes. Against this backdrop, the present study suggests that meaningful forms of school innovation may nevertheless emerge through bottom-up processes rooted in professional collaboration, organizational learning, and shared curricular reflection. While systemic and sustained reform remains highly desirable, the case illustrates how local school communities can activate context-sensitive forms of innovation capable of improving learning environments, pedagogical practices, and students' educational experiences. In this sense, curriculum redesign around essential disciplinary concepts may function not only as a pedagogical strategy for promoting deeper learning, but also as an organizational infrastructure capable of activating meaningful innovation processes even within structurally constrained educational systems.

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