



Teacher education is a deeply pedagogical process rooted in values, ethics, and the social purpose of schooling. Globally, it sits at the core of educational quality and fairness, as research in comparative and international education demonstrates: the training of teachers directly influences students' learning chances, social inclusion, and the democratic aims of schools. Teachers are not simply transmitters of curricula, but active professionals whose convictions, reflective skills, and ability to manage the complexities of classroom life give shape and substance to the educational experience itself.

The pedagogical dimension of teacher education frames teaching as a relational, context-aware, and ethically grounded profession rather than just a set of procedural skills. From a research perspective, this demands robust research methodologies that can critically examine the complex realities of schools and inform evidence-based policies. Equally important is the connection between theory and practice, which helps to bridge the persistent gap between universities and schools.

The contributions gathered in this volume reflect the richness and diversity of experiences showcased during the ATEE Spring Conference 2024, held at the University of Bergamo from May 29 to June 1, 2024. The volume presents 70 selected papers out of more than 300 presented by researchers representing over 40 countries.

This broad spectrum of studies highlights promising directions that can inspire renewed inquiry and concrete proposals aimed at improving contemporary educational systems.

FRANCESCO MAGNI is an Associate Professor of General and Social Pedagogy (PAED-01/A) at the Department of Human and Social Sciences, University of Bergamo, Italy. He is a member of the board and Deputy Director of CQIIA (Center for the Quality of Teaching, Didactic Innovation, and Learning). He is also a member of the ATEE - Association for Teacher Education in Europe.

NICOLE BIANQUIN is an Associate Professor of Didactics and Special Education (PAED-02/A) at the Department of Human and Social Sciences, University of the Aosta Valley, Aosta, Italy. She is a member of the ATEE - Association for Teacher Education in Europe.

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Teacher education research in Europe: trends, challenges, practices and perspectives

May 29th – June 1st, 2024
S. Agostino, Bergamo



Edited by Nicole Bianquin and Francesco Magni





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BOOK OF PROCEEDINGS

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Development of teachers' competencies on Learning Design and on supporting student's Self-Regulated Learning in the lower secondary school

Alice Roffi, *University of Florence*, alice.roffi@unifi.it
Gabriele Biagini, *University of Florence*, gabriele.biagini@unifi.it
Stefano Cuomo, *University of Florence*, stefano.cuomo@unifi.it
Maria Ranieri, *University of Florence*, maria.ranieri@unifi.it

Abstract

The Erasmus+ project SuperRED, led by University of Florence, originated from the challenges encountered during the COVID-19 pandemic on the limited digital competences of students and teachers in using digital technologies for teaching and learning. SuperRED's activities focused on augmenting teachers' Learning Design (LD) capabilities to boost students' Self-Regulated Learning (SRL). This approach was implemented in 3 schools (Belgium, Italy, and Catalunya), co-designing and testing 8 educational scenarios promoting students' SRL competence in the lower secondary school. A survey was developed to collect teachers' perceptions of their LD skills and ability to support students' SRL. Results indicated that the SuperRED approach seems to improve teachers' LD skills and students' SRL competences, raising areas for improvement in terms of professional development, as the design of activities, the mediation of student collaboration, and the enhancement of students' self-reflection during learning activities.

Keywords: Learning Design; Self-Regulated Learning; digital technology.

1. Introduction

The Erasmus+ project "Supporting Self-Regulated Learning in Digital and Remote Education" (SuperRED), led by the University of Florence, emerged in response to the profound challenges faced by educational systems during the COVID-19 pandemic. These challenges underscored the limited digital competences of both students and teachers in leveraging digital technologies for effective teaching and learning (Carretero-Gomez et al., 2021; Ranieri, Gaggioli, Borges, 2020). SuperRED's core objective was to enhance teachers' Learning Design (LD) capabilities to foster students' Self-Regulated Learning (SRL) skills, as conceptualized by Zimmerman's SRL phases (Zimmerman, 2008). In this context, the notion of competence refers to the integrated set of knowledge, skills, and attitudes that enable teachers to design, implement, and reflect on effective learning experiences (Redecker, 2017). On the other hand, Self-Regulated Learning competence in students involves the capacity to independently manage cognitive, motivational, and behavioral aspects of learning, across the phases of forethought, performance, and self-reflection (Zimmerman, 2008).

The initiative employed innovative tools such as the 4Ts game for macro-design of collaborative activities (Pozzi, Ceregini, Persico, 2015), supported by digital technologies to advance SRL.

The pandemic's abrupt cessation of in-person teaching catalyzed a rapid digital transformation of education (Bond, 2020; Nurhas et al., 2022). However, it also exacerbated pre-existing issues within educational systems, particularly concerning digital readiness and the capacity for effective remote instruction (Carretero-Gomez et al., 2021). This sudden transition, termed Emergency Remote Education (ERE), revealed significant gaps in digital preparedness among educators and learners, as extensively documented in studies from the COVID-19 period (e.g., Carretero-Gomez et al., 2021; Giovannella, Passarelli & Persico, 2020; INDIRE, 2020; Ranieri, Gaggioli & Kaschny Borges, 2020).

In response, SuperRED developed a comprehensive framework for inclusive and effective digital education. This framework aimed not only to address immediate challenges but also to build resilience for the medium and long term. These tools and strategies supported teachers in creating collaborative educational scenarios that align with pedagogical goals while enhancing students' SRL skills.

The SuperRED approach was developed through a consortium of researchers and teachers from 4 countries (Belgium, Italy, The Netherlands, and Catalonia), working collaboratively to design theoretical and practical tools for educational innovation. Central to this approach was a theoretical framework that provided guidelines for the design and implementation of collaborative activities, emphasizing the support of students' SRL. The 4Ts game—focused on defining dimensions such as Task, Team, Technology, and Time—was a pivotal tool for macro-designing scenarios. Additionally, a final template, specifically developed within the SuperRED project, enabled educators to transition from macro to micro-level design, ensuring coherence and adaptability to contextual constraints.

A central focus of the project was the professional development of teachers, many of whom felt unprepared to transition traditional classroom practices to digital environments. This challenge was particularly pronounced in countries like Italy and Spain, where replicating face-to-face dynamics in online settings often led to decreased student engagement and mixed outcomes (Carretero-Gomez et al., 2021). Similar issues arose in Belgium, where educators faced low digital skill levels and increased workloads.

For students, the pivot to remote learning highlighted a pressing need for enhanced self-management and autonomy. The lack of immediate feedback and diminished peer interaction frequently led to heightened stress and reduced motivation (Donnelly & Patrinos, 2022). SuperRED's interventions prioritized the promotion of SRL and collaborative learning through digital tools, mitigating risks such as disengagement and learning loss. By emphasizing asynchronous and collaborative learning models, the project aimed to address barriers posed by limited internet access and the isolating nature of remote education.

Thus, the main aim of this research was to test the SuperRED approach in a real life context, the lower secondary school, investigating the perceptions of teachers on the improvement of their LD skills and their capacity to promote the students' SRL. According to this objective the Research Questions (RQ) that guided the research were the following:

RQ1: Has the SuperRED approach (i.e., co-design of educational scenarios through the use of LD tools and grounding on the SuperRED framework) been effective and relevant in promoting teachers' LD skills in terms of professional development?

RQ2: Has the educational scenario based on the SuperRED approach (i.e. co-design of educational scenarios through the use of LD tools and grounding on the SuperRED framework) been effective in promoting students' SRL skills, particularly referring to forethought, performance and self-reflection phases of SRL?

2. Methodology

The research followed a mixed-methods approach, integrating both quantitative and qualitative data. This methodology was selected to capture the multifaceted nature of the interventions and their effects on both teachers and students. The design consisted of a quasi-experimental model with pre- and post-intervention data collections, particularly focused on teachers' perceptions and reported student outcomes. While quantitative data were primarily gathered through structured surveys using Likert scales, qualitative insights were obtained from open-ended survey questions and teacher narratives. The combination of methods allowed for triangulation, strengthening the validity of the findings.

2.1 The context and the SuperRED approach

The study was conducted within the framework of the SuperRED project, which aimed to enhance teachers' LD skills and their capacity to support students' SRL. Building on the comprehensive approach described in the introduction, the methodology focused on testing the tools (the framework, 4Ts game and the template for micro-design) developed through SuperRED in real educational settings.

These tools permitted the design of 8 collaborative educational scenarios on different topics (Informatics, Media Education, Science, Mathematics, Arts, Civic Education) that were implemented in lower secondary schools of 3 countries of the SuperRED consortium (Belgium, Italy, and Catalonia), in March – May 2023,

2.2 The tool for data collection

A survey was developed to collect teachers' perceptions of their LD competences and ability to support students' SRL, including both closed and open questions. It was structured in 3 sections:

1. General Information, collecting information about Age, Gender, Professional qualification, Teaching experience;
2. The LD section for collecting teachers' perceptions about their LD skills. In particular, it was asking teachers their perceptions of LD skills in the following phases: Conceptualisation of the design idea (defining learning objectives, identifying content area/s to be addressed and choosing the most appropriate pedagogical strategies), Planning and authoring (including association of the educational resources and tools that learners are to use), Implementation of the resulting design and enactment with learners (providing differentiated activities and ensuring that the design features have potential for developing students Self-Regulated Learning skills);
3. The SRL section for investigating what SRL skills the teachers supported during the implementation of the educational scenarios, particularly referring to the dimensions of Zimmermann (2008), Forethought (focusing on task analysis and self-motivation beliefs), Performance (focusing on self-control and self-observation), and Self-Reflection (focusing on self-judgement and self-reactions) (Zimmerman, 2008).

In the closed questions teachers indicated their perceptions through a 5-point Likert scale from "Not at all" (1 point) to "A great deal" (5 point), for quantifying the improvement perceived, and "Strongly disagree" (1 point) to "Strongly agree" (5 point), for expressing the level of agreement on a statement.

2.3 The sample

The sample of this research was the teachers implementing the 8 educational scenarios. Ten teachers completed the survey: 3 from Belgium, 2 from Catalunya and 5 from Italy, further characteristics are summarized in the table below:

Number of teachers	10
Age	7/10 between 45-54 years, 1/10 between 25-34 years, 1/10 between 35-44 years, 1/10 lower than 25 years
Gender	6 females, 4 males
Nationality	3 from Belgium, 2 from Catalunya and 5 from Italy
Educational Background	6/10 bachelor's degree, 3/10 master's degree and 1/10 a PhD
Teaching Experience	6/10 more than 10 years of experience, 2/10 about 20 years (2/10), 2/10 more than 5 years, and 1/10 less than 5 years of experience

Table 1: Sample characteristics

3. Results

3.1 RQ1: Has the SuperRED approach (i.e., co-design of educational scenarios through the use of LD tools and grounding on the SuperRED framework) been effective and relevant in promoting teachers' LD skills in terms of professional development?

To evaluate the efficacy of the SuperRED approach in advancing teachers' LD capabilities, a comprehensive analysis of data collected through post-surveys was undertaken. The survey, administered following the testing phase, targeted 3 pivotal dimensions of LD: conceptualization of pedagogical design, planning and authoring of educational activities, and implementation and enactment of the developed scenarios with learners.

Participants consistently reported marked improvements across all examined dimensions of LD. On a 5-point Likert scale, where 1 corresponded to "Not at all" and 5 to "A great deal," teachers' responses yielded mean scores of 3.4 for both the conceptualization and planning phases, and 3.3 for the implementation phase. These values signify a notable enhancement situated between "A moderate amount" and "A lot," underscoring the SuperRED approach's capacity to scaffold educators' proficiency in constructing effective, collaborative learning designs. Of particular note, the conceptualization phase enabled participants to align learning objectives with pedagogical strategies systematically. In parallel, the planning and authoring phase facilitated meticulous selection of resources and tools, ensuring coherence with contextual constraints and learning objectives.

Central to the SuperRED framework, the 4Ts game emerged as an instrumental tool in fostering professional growth. Teachers rated the game highly in terms of engagement (M=4.0), motivation (M=4.2), and utility (M=4.1) in facilitating the macro-design of collaborative activities. These scores, averaging between "A lot" and "A great deal," reflect the game's effectiveness in promoting creative and structured pedagogical planning. Teachers elaborated that the game's predefined yet adaptable structure encouraged innovative thinking while maintaining clarity in instructional design. Furthermore, the 4Ts game was credited with enhancing participants' ability to construct collaborative activities (M=3.8), reinforcing its role as a catalyst for professional development.

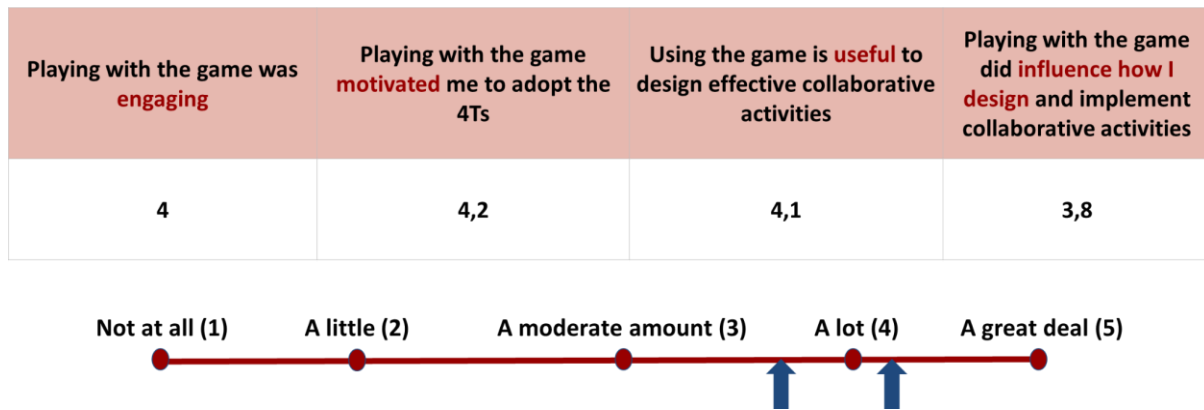


Figure 1: Synthesis of the answers of the second question on LD (n=10 teachers). It has been reported the mean value for each characteristic of the 4Ts game. The answer's options foreseen a likert 5-point scale from "Not at all" (1) to "A great deal" (5). The blue arrows indicate the position of the teachers' answers.

Despite the overwhelmingly positive feedback, the implementation of learning scenarios revealed critical challenges:

- Time Constraints: Limited availability of instructional and preparatory time emerged as a predominant barrier. Teachers frequently struggled to reconcile the demands of the scenarios with their existing curricular obligations, as exemplified by comments such as "Problems with timing and the few hours available per week";
- Collaborative Dynamics: Managing the intricacies of student collaboration posed difficulties. Teachers observed variability in engagement levels, with some students exhibiting reluctance to participate fully, thereby disrupting group cohesion;
- Design Adjustments: Disparities between planned and actual task durations necessitated real-time modifications. Additionally, several participants identified a need for more explicit strategies to optimize group composition and integrate prompts aimed at fostering self-regulation;
- Tool-Related Issues: Four teachers identified obstacles associated with the 4Ts game. These included insufficient time for familiarization, inadequate instructional support, and limited digital competencies, emphasizing the necessity of robust preparatory resources.

Among the identified obstacles, the "Task" dimension of the 4Ts game was particularly problematic. Three of the four teachers who encountered difficulties attributed these to inadequate digital proficiency (2/4) or unfamiliarity with the game's content (1/4). While issues related to "Time" and "Technology" were less pronounced, they nevertheless underscored the importance of comprehensive training and contextualized examples to facilitate effective utilization of the game. Participants suggested that augmented guidance materials, including detailed case studies, could bridge these gaps and support more effective task integration.

3.2 RQ2: Has the educational scenarios based on the SuperRED approach (i.e. co-design of educational scenarios through the use of LD tools and grounding on the SuperRED framework) been effective in promoting students' SRL skills, particularly referring to forethought, performance and self-reflection phases of SRL?

To evaluate the impact of the SuperRED approach on fostering students' SRL skills, a robust and multidimensional analysis was undertaken. This investigation encompassed data from pre- and post-surveys of students, as well as post-surveys from teachers, targeting three fundamental SRL phases defined by Zimmerman (2008): forethought, performance, and self-reflection. These phases represent critical facets of self-regulation, focusing on students' capacity to strategically plan, effectively execute, and critically evaluate their learning activities.

Post-surveys administered to teachers revealed highly positive evaluations of the SuperRED approach's efficacy in fostering SRL skills among students. A majority of respondents recognized the

learning scenarios as instrumental in supporting all three SRL phases. The performance phase received the highest mean rating ($M=3.74$), reflecting the significant impact of the approach on students' ability to apply learning strategies and complete tasks successfully. The self-reflection phase, which involves students critically evaluating their outcomes and refining strategies, followed closely with a mean rating of $M=3.57$. The forethought phase, while slightly less emphasized ($M=3.42$), still garnered positive feedback, underscoring its role in facilitating initial goal-setting and task analysis. Teachers frequently emphasized that the structured and interactive components of the SuperRED framework were pivotal in fostering deep engagement and systematic skill development during these phases.

The qualitative data provided by teachers offered nuanced perspectives that enriched the quantitative findings. Teachers highlighted several benefits of the SuperRED approach:

- **Increased Student Motivation:** A significant number of teachers observed heightened levels of student engagement and enthusiasm. This was often attributed to the interactive and collaborative elements embedded in the learning scenarios.
- **Enhanced Awareness of Learning Strategies:** Both teachers and students reported a greater understanding of effective learning strategies, particularly during the performance phase, where students were actively applying these techniques.
- **Improved Reflective Practices:** Students demonstrated an increased capacity to assess their progress, recognize areas for improvement, and refine their strategies, aligning with the objectives of the self-reflection phase.

Nevertheless, some challenges emerged, particularly in the forethought and self-reflection phases. Teachers noted difficulties in guiding students through task analysis and goal-setting, with several students displaying limited self-motivation or struggling to conceptualize actionable plans. In the self-reflection phase, some students found it challenging to critically evaluate their learning outcomes, particularly in identifying specific areas for improvement or connecting outcomes to their initial goals. Teachers observed that while students could describe their experiences, many struggled to articulate concrete lessons learned or to apply feedback effectively to future tasks. These observations highlight the importance of scaffolding reflective activities with clear prompts and structured feedback mechanisms. Teachers reported that while students could describe their experiences, many of them struggled to articulate concrete lessons learned or to effectively apply feedback to future tasks. These observations highlight the importance of scaffolding reflective activities with clear prompts and structured feedback mechanisms.

Overall, the project findings establish that the SuperRED approach contributes meaningfully to both teacher and student development. However, the challenges encountered during the implementation phase—particularly concerning the scaffolding of SRL—call for a more thorough reflective analysis. The following discussion elaborates on these results, connecting them with existing literature and highlighting implications for future practice and research.

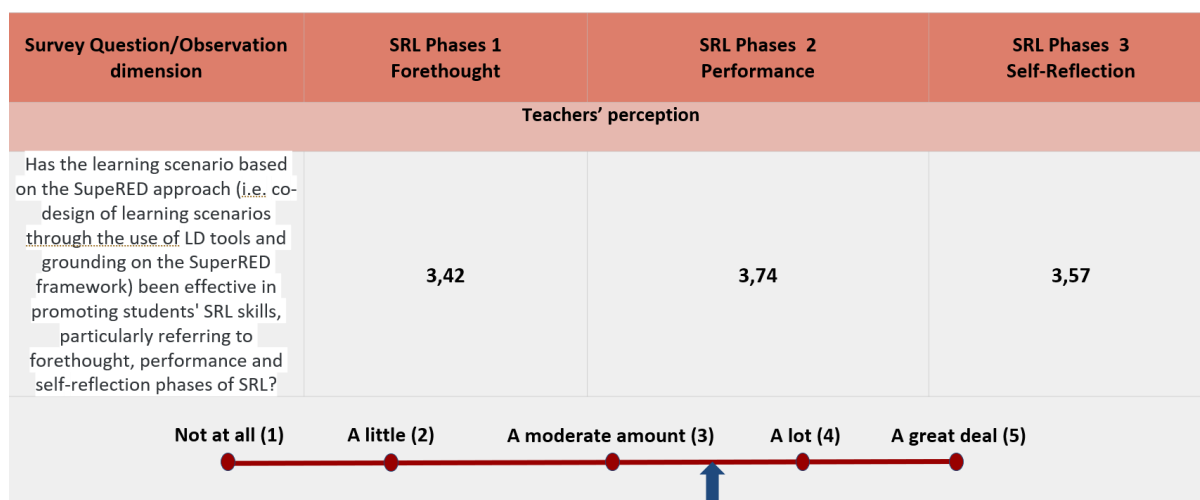


Figure 2: Teachers's perception about the 3 SRL phases.

4. Discussion

The findings of this study underscore the important role of structured and interactive frameworks, such as the SuperRED approach, in cultivating teachers' Learning Design and students' Self-Regulated Learning skills. This research aligns with prior investigations that emphasize both the challenges and transformative potential of digital education, particularly accelerated by the COVID-19 pandemic. As Carretero-Gomez et al. (2021) and Ranieri, Gaggioli, and Borges (2020) highlighted, the abrupt shift to remote learning exposed substantial gaps in digital literacy among both students and educators, demanding innovative and adaptive solutions to reimagine pedagogical practices and outcomes.

The SuperRED approach addressed these challenges by providing educators with targeted tools such as the 4Ts game and templates guiding the micro-design process. These instruments significantly enhanced teachers' abilities to conceptualize, plan, and implement effective educational scenarios. Consistent with findings from Giovannella, Passarelli, and Persico (2020), this study underscores the importance of structured support mechanisms to navigate the complexities of hybrid and remote learning environments. Teachers' reports of improved professional competencies reflect the efficacy of the SuperRED framework in bridging theoretical concepts with practical application, enabling educators to design collaborative and meaningful learning experiences.

In terms of SRL, teachers' perception highlighted improvements in students' performance and self-reflection capabilities. Students demonstrated enhanced proficiency in executing learning strategies and critically evaluating their outcomes, reinforcing the validity of Zimmerman's (2008) SRL model, which interlinks forethought, performance, and self-reflection phases. However, the forethought phase presented notable challenges, with students struggling to effectively analyze tasks and set actionable goals. This mirrors observations by Donnelly and Patrinos (2022), who emphasize the necessity of providing scaffolding during the preparatory stages to foster student autonomy and intrinsic motivation.

Further analysis revealed persistent difficulties in the self-reflection phase. Many students encountered obstacles in deriving actionable insights from their learning experiences or connecting results to their original objectives. These challenges underscore the importance of integrating structured frameworks and feedback mechanisms into the reflective process. Such strategies align with recommendations by Nurhas et al. (2022), advocating for the incorporation of digital tools and collaborative methods to enrich reflective learning. Teachers noted that while students exhibited a general awareness of their progress, the ability to translate observations into tangible improvements remained inconsistent, highlighting an area for targeted intervention.

Qualitative feedback from teachers highlighted the motivational benefits of the SuperRED approach. The emphasis on collaboration and interactive learning was consistently cited as a key factor in sustaining engagement. These findings resonate with Bond's (2020) observations regarding the value of peer interaction in counteracting the isolation associated with remote learning. Teachers reported increased student enthusiasm and active participation related to a sense of community and shared purpose, since the SuperRED approach bridged the divide between digital tools and meaningful learning outcomes.

Nonetheless, the study highlighted areas requiring further development. The relatively weaker outcomes in the forethought and self-reflection phases perceived by the teachers suggest a need for more robust scaffolding and support mechanisms. Future iterations of the SuperRED framework should prioritize the integration of enhanced planning tools, such as visual organizers and goal-setting templates, to bolster students' preparatory skills. Additionally, real-time feedback systems could be leveraged to provide immediate guidance during the performance phase, sustaining motivation and self-monitoring. Structured reflection activities, such as guided journaling and peer evaluations, would also help students deepen their analytical skills and connect their learning processes to measurable improvements.

Adaptive digital technologies represent another promising avenue for refining the SuperRED approach. Personalized learning platforms could offer tailored feedback and adaptive resources, ensuring that both teachers and students receive the support needed to address their unique challenges. By aligning technological innovation with pedagogical principles, the framework could achieve greater scalability and impact across diverse educational contexts.

In conclusion, the SuperRED approach emerges as a potential tool for enhancing teachers' LD skills and their ability to promote students' SRL, offering a scalable and effective methodology for modern education. By addressing both its successes and areas for improvement, educators and researchers can refine the approach to meet the evolving demands of digital and hybrid learning environments. This study aligns with broader goals articulated by Carretero-Gomez et al. (2021) to foster resilience and adaptability within educational systems, ensuring that educators and learners are equipped to thrive in an increasingly dynamic and digital world. The SuperRED framework not only bridges current gaps but also lays the groundwork for sustainable and equitable learning practices, reinforcing its potential as a cornerstone of 21st-century education.

5. Conclusion

The outcomes of this study underscore the transformative potential of the SuperRED approach in addressing the complexities of digital and hybrid education. By providing educators with structured tools and methodologies, the approach not only bridges existing gaps in professional competencies but also fosters students' SRL skills across critical phases of learning. The improvements perceived by the teachers in students' performance and self-reflection highlight the framework's effectiveness in promoting meaningful engagement and deeper learning.

However, this study also reveals areas for refinement. Persistent challenges in the forethought and self-reflection phases emphasize the need for enhanced scaffolding, structured reflection opportunities, and tailored feedback systems. Addressing these aspects through iterative improvements can significantly augment the impact of the approach, ensuring that it equips learners with the autonomy and adaptability required in a dynamic educational landscape.

Furthermore, the integration of adaptive digital technologies holds promise for personalizing learning experiences, providing real-time support, and scaling the framework across diverse educational contexts. Such innovations can amplify the benefits of the SuperRED approach, making it a cornerstone for fostering resilience and equity in education.

In conclusion, the SuperRED approach seems to be a forward-looking model for modern education, offering practical solutions to the challenges of fostering SRL in digital and hybrid environments. By continuing to refine and expand its applications, educators and researchers can contribute to creating more inclusive, sustainable, and effective learning experiences for all students.

Bibliography

- Bond, M. (2020). Schools and emergency remote education during the COVID-19 pandemic: A living rapid systematic review. *Asian Journal of Distance Education*, 15(2), 191-247. <https://www.asianjde.com/ojs/index.php/AsianJDE/article/view/517>.
- Carretero Gomez, S., Napierala, J., Bessios, A., Mägi, E., Pugacewicz, A., Ranieri, M., Triquet, K., Lombaerts, K., Robledo Bottcher, N., Montanari, M., & Gonzalez Vazquez, I. (2021). What did we learn from schooling practices during the COVID-19 lockdown? Publications Office of the European Union. <https://op.europa.eu/en/publication-detail/-/publication/1e0ccef2-509f-11eb-b59f-01aa75ed71a1/language-en>
- Donnelly, R., & Patrinos, H.A. (2022). Learning loss during COVID-19: An early systematic review. *Prospects*, 51, 601-609. <https://doi.org/10.1007/s11125-021-09582-6>.
- Giovannella, C., Passarelli, M., & Persico, D. (2020). Measuring the effect of the COVID-19 pandemic on the Italian Learning Ecosystems at the steady state: A school teachers' perspective. *Interaction Design and Architecture(s) Journal*, 45, 264-286. <https://doi.org/10.55612/s-5002-045-012>.
- INDIRE (2020). Indagine tra i docenti italiani pratiche didattiche durante il lockdown. Report preliminare. <http://www.indire.it/wp-content/uploads/2020/07/Pratiche-didattiche-durante-il-lockdown-Report-2.pdf>.
- Nurhas, I., Aditya, B. R., Jacob, D. W., & Pawlowski, J. M. (2022). Understanding the challenges of rapid digital transformation: The case of COVID-19 pandemic in higher education. *Behaviour & Information Technology*, 41(13), 2924-2940. <https://doi.org/10.1080/0144929X.2021.1962977>.
- Pozzi, F., Ceregini, A., & Persico, D. (2015). "ProgeTTTTare" l'apprendimento collaborativo con 4T. *TD Tecnologie Didattiche*, 23(3), 132-138.
- Ranieri, M., Gaggioli, C., Borges, M.K. (2020). La didattica alla prova del Covid-19 In Italia. Uno studio sulla scuola primaria. *Praxis educativa*, 15.
- Ranieri, M., & Sangrà, A. (2024). Exploring Self-Regulated Learning in Digital Education: Learning design, technology and practice. *Pensa Multimedia*
- Redecker, C. European Framework for the Digital Competence of Educators: DigCompEdu. Punie, Y. (ed). EUR 28775 EN. Publications Office of the European Union, Luxembourg, 2017, ISBN 978-92-79-73494-6, doi:10.2760/159770, JRC107466
- Zimmerman, B. J. (2008). Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. *American educational research journal*, 45(1), 166-183.