



# ISYDE2023

Italian Symposium on  
DIGITAL EDUCATION

Reggio Emilia, 13 - 15 September 2023

Innovating Teaching & Learning.  
Inclusion and Wellbeing for the Data Society

**Tommaso MINERVA & Annamaria DE SANTIS (Eds.)**

# Conference PROCEEDINGS

**Proceedings of the Italian Symposium on Digital Education, ISYDE2023**

Reggio Emilia (Italy), September 13-15, 2023

**Edited by**

T. Minerva, A. De Santis

Sle-L, Società Italiana di e-Learning

University of Modena and Reggio Emilia

Copyright © 2024

PUBLISHED BY PEARSON

WWW.PEARSON.COM

ISBN: 9788891936516

# A framework for Learning Design and Self-Regulated Learning: first results of SuperRED Project

Alice ROFFI, Gabriele BIAGINI, Stefano CUOMO, Maria RANIERI

*University of Florence, Florence (ITALY)*

## Abstract

*Supporting Self Regulated Learning in Digital and Remote Education (SuperRED) is an Erasmus+ funded project involving researchers and school partners from four European countries (Italy, Spain, Belgium, The Netherlands). One of the main results of the project is the development of a theoretical framework, including guidelines for Learning Design and Self-Regulated Learning – named “SuperRED framework” – aimed to support teachers in designing and implementing effective and engaging learning activities leveraging on students’ self-regulation processes. This study describes the activities carried out for the development of the SuperRED framework, including the literature review, the administration of a survey for teachers, and the expert validation of its draft version. The framework is one of the tools, developed by the project, to support teachers in an effective design of learning activities to support self-regulated learning.*

**Keywords:** Learning Design, Self-Regulated Learning, Distance Education, Digital Technologies.

## 1. Introduction

Supporting Self-Regulated Learning in Digital and Remote Education (SuperRED) is an Erasmus+ funded project (2021-2024), involving researchers and school partners from four European countries (Italy, Spain, Belgium, The Netherlands). This project has been conceived during the Covid-19 pandemic that, for long periods, forced students and teachers behind a screen for educational purposes. One of the main challenges in facing this situation was the low level of digital competences of students and teachers in using digital technologies for teaching and learning (Carretero-Gomez et al., 2021; Ranieri, Gaggioli & Borges, 2020). Moreover, according to recent studies on the Italian context, in the online environment teachers have mainly reproduced face-to-face classroom dynamics with mixed results causing, as a general outcome, a loss of contact with 6-10% of students (Giovannella, Passarelli & Persico, 2020; INDIRE, 2020; SIRD, 2020). This was mainly due to their lack of competences for blended/remote Learning Design (LD) and in the scarce capacity of supporting student’s motivation and Self-Regulated Learning (SRL), especially in digital contexts (Carretero-Gomez et al., 2021).

To address these limitations that, besides the emergency period, may constitute a significant barrier to the adoption of effective teaching strategies in remote/blended environments, SuperRED aims at increasing the digital readiness of the school ecosystem to manage an effective shift towards digital education and fostering the resilience to tackle unplanned events of the teachers and students at the lower secondary schools. To this purpose, in the first phase of the project, the Consortium developed a framework – named “SuperRED Framework” – to support teachers in designing and implementing effective and engaging learning activities with a focus on digital and remote education, LD and SRL. The aim of this study is to illustrate the activities carried out for the development of the SuperRED framework’s development, with a focus on the different steps from the literature review to its final validation.

## 2. Methods

The SuperRED framework was conceived as a compendium of pedagogical guidelines aimed at facilitating the implementation of LD and fostering the advancement of students’ SRL across diverse

educational contexts. The process of its development included a literature search and the integration of the scientific evidence with a survey aiming at collecting teachers' knowledge, experiences and needs on the main themes of SuperRED, namely LD and SRL. Firstly, it has been defined the structure of the framework (see Figure 1), considering the main themes of SuperRED (LD and SRL) from three different perspectives (Methods/Models; Tools/Technologies; Learning Ecologies) within three different contexts, that is Remote (Re), Blended (Bl) and Face-to-face (F2f). The six blocks (A1-3; B1-3) at the intersection of the different dimensions correspond to the six conceptual areas in which the guidelines have been organised.

|        |                         | Perspective                                                                                                                                                   |                                                                                                                                          |                                                                                                                                                                              |
|--------|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|        |                         | Methods/Models                                                                                                                                                | Tools/Technologies                                                                                                                       | Learning Ecologies                                                                                                                                                           |
|        |                         | What are the indications for a most effective <b>methods and models</b> to support the learning design and/or self-regulated learning in Re, Bl F2f contexts? | What are the most effective tools and technologies to support the learning design and/or self-regulated learning in Re, Bl F2f contexts? | What are the indications about the <b>learning ecologies</b> aspects to considered for supporting the learning design and/or self-regulated learning in Re, Bl F2f contexts? |
| Themes | Learning Design         | <b>A1</b>                                                                                                                                                     | <b>A2</b>                                                                                                                                | <b>A3</b>                                                                                                                                                                    |
|        | Self-regulated learning | <b>B1</b>                                                                                                                                                     | <b>B2</b>                                                                                                                                | <b>B3</b>                                                                                                                                                                    |

**Figure 1** - The Structure of the SuperRED Framework.

The process of selection and analysis of the papers for the literature review was structured into three phases and involved all the project partners:

- *Phase 1* – Identification of the seminal papers: in this phase the research partners identified the seminal papers on the main themes of SuperRED, LD and SRL, according to the three perspectives (methods/models, tools/technologies and learning ecologies) and in the three different contexts (remote, face-to-face, blended). The papers identified were 8/10 for each area.
- *Phase 2* – Selection of the papers to be included in the analysis: the papers identified in the previous phase were subjected to a further selection process, involving all the research partners according to each expertise. At the end of this phase, 32 papers were selected for the final analysis.
- *Phase 3* – Analysis of the papers: the analysis was guided by the following question “What are the indications for the most effective methods and models/tools and technologies/learning ecologies aspects to support the LD and/or SRL in Re, Bl F2f contexts?”. The drawn information was structured as guidelines to create the first draft of the framework.

Furthermore, to enhance the applicability of the framework and assess its relevance, a survey tailored to the needs and practices of teachers was delivered to the partner schools, and the results were integrated into the draft of the framework. The main purpose of this survey was to collect teachers' experience, knowledge, and needs for the implementation of LD and SRL in classrooms. This step was conceived to link the theory with the practice, to develop a framework that better suits teachers' requirements. Thus, a questionnaire was created and administered to the teachers of the SuperRED school partners between the 20th June 2022 to 10th July 2022. It was organized into three main areas: General information, questions on LD and questions on SRL. The questions were implemented into Qualtrics and delivered in four different languages according to the country involved in the project (English, Italian, Catalan, and Dutch).

Finally, the last step included the validation of the framework, with the involvement of an international panel of teachers and researchers, selected outside the SuperRED consortium to ensure independence of validation. These experts express their opinions on the framework through a Google form, evaluating its clarity, understandability, consistency, and significance to be adopted by teachers and researchers as guidelines for an effective LD and SRL.

### 3. Results

The integration of the literature evidence and the survey results led to the first version of SuperRED Framework, that considers LD and SRL dimensions, each declined in the three different perspectives mentioned in the previous section, resulting into the following set of guidelines:

#### 3.1 Learning Design

*Methods and models:* this perspective focuses on the process of the learning design and the relative steps, starting from the consideration of the design level teachers are working on, the attention to the context of the learning activities, the consistency between the defined learning objective and the teaching strategies to reach them, the integration of the resources (i.e. human, digital) and the evaluation aspect. For methods and models to support effective LD the following guidelines are suggested:

1. clarify the focus of your learning event and define the design level you are working on: micro level, few hours of learning; meso level, usually a semester's work, macro level, an entire course program (Conole, 2012; Goodyear & Dimitriadis, 2013).
2. pay attention to the context in which the intervention takes place: the background and peculiarities of the actors involved as well as the affordances of the learning environment. The learning environment influences learning itself. Also, it is important to consider the nature of the relationship between learners and teacher, what should be learnt and how it should be achieved (Conole, 2012; Goodyear & Dimitriadis, 2013).
3. define the teaching strategies in accordance with the learning objectives in order to increase the effectiveness of the learning experience. Teaching strategies should be defined appropriately while considering the type of learning objective to be pursued (Pozzi, Manganello & Persico, 2022; Bond, 2020; Pozzi, Ceregini & Persico, 2015).
4. highlight relevant resources and tools and integrate them in a time sequence. Resources may be human, technological or artifacts designed for learning (such as models, diagrams or lesson plans). When you choose resources and tools, take into consideration students' level of competence (Mor, Craft & Maina, 2015; Conole, 2012; Bond, 2020).
5. run the learning intervention: provide differentiated activities and ensure that tasks are not assigned above or below students' abilities. The teacher may give students the freedom to choose digital and/or analogic tools they want to work with (e.g., tablets, books), or students may be told who they have to work with (e.g. in teams of four, or in a work group) and allowed to choose their own learning project (Goodyear & Dimitriadis, 2013; Conole, 2012; Bond, 2020).
6. monitor and evaluate the effectiveness of the intervention providing different forms of assessment, traditional and digital. Remind the consistency between objective, learning approach and evaluation strategies, including formative and summative assessment, peer assessment and self-assessment (Conole, 2012; Bond, 2020).
7. adapt the intervention on the basis of the feedback received: take into account the learning outcomes (new knowledge, skills, abilities) manifested in students' artifacts and pupils' daily work. This feedback could lead the designer to a revision of the initial idea of the learning intervention: design and redesign are intimately related (Bower & Vlachopoulos, 2018; Mor, Craft & Maina, 2015; Goodyear & Dimitriadis, 2013; Conole, 2012).

*Tools and Technologies:* this perspective focuses on the use of tools and technology in general for the learning design process, paying attention to the aspect of sharing teachers' design with the community, and, when possible, to use the data to inform the design process. For tools and technologies to support effective LD the following guidelines are suggested:

1. use a LD tool both to reflect on teachers' way of thinking and behaving or to foster a different approach. The use of a LD tool can foster a smoother and more organic design experience for novice teachers or for teachers who usually design in a rough fashion (Pozzi et al., 2020).
2. share your design for sustaining the online collaboration and peer-review. It is important to share the learning designs among teachers thus supporting collaboration and peer-review, in order to build a pedagogical knowledge community (Laurillard et al., 2018).

3. when possible, exploit the data for informing the learning design process and community building, according to the GDPR. The use of educational data for the LD process was encouraged, to improve the LD competencies (Hernández-Leo et al., 2019; Kurvits, Laanpere & Väljataga, 2015).

*Learning Ecologies:* this perspective focuses on developing learning strategies in terms of individual learning ecologies taking into account the learner's intention and motivation, and in the importance of integrating ICT resources both as elements and as training strategies to improve teachers learning ecologies and the pedagogical, technological and contextual areas during the design process. For learning ecologies to support effective LD the following guidelines are suggested:

1. take into account the student agency, learner intentions and motivations as well as past trajectories in developing learning strategies for the individual learning ecologies perspective. The central components of an individual's learning ecology interplay with attributes of learning, including student agency, learner intentions and motivations as well as past trajectories in developing learning strategies (Peters & Romero, 2019).
2. incorporate ICT resources both as elements and as training strategies to improve teachers learning ecologies in the perspective of continuing professional development. The online resources are key for teachers' current learning ecologies, for this they should be included in the teachers' training system and in a wider perspective in the continuing professional development (González-Such et al., 2021).
3. pedagogical, technological and contextual areas are the most important to be addressed during the learning design. These areas must be taken into account for reflection and appropriate decision-making in order to promote the optimal construction and adequate development of learning ecologies (Santos-Caamaño, Vázquez-Cancelo & Rodríguez, 2021).

### 3.2 Self-Regulated Learning

*Methods and Models:* this perspective focuses on the multifaceted nature of regulation, encompassing motivational, emotional, behavioral, and cognitive aspects, with a focus on engaging learners based on their purposes, intents, and goals. It emphasizes the importance of enabling learners to connect theory and practice through personal goal setting or personalizing course goals. For methods and models to support effective SRL the following guidelines are suggested:

1. being regulation multifaceted involving motivational, emotional, behavioral, and cognition aspects, engage learners considering their purposes, intents, and goals. Since engagement is multidimensional, all types of interaction should be considered when planning media use, including traditional media printed, broadcast, or recorded-and newer teleconference media (Zimmerman, 2002; Panadero, 2017; Hadwin, Jarvela & Miller, 2016; Zimmerman, 2008; Pelikan et al., 2021; Edisherashvili, 2022; Moore, 1989).
2. enable learners to link theory and practice by setting personal goals, or personalizing course's goals. Such practices contribute to making learners more engaged and motivated in the learning process. Researching regulation also requires an understanding of the beliefs, self-perceptions, and mental models that shape and are shaped by these observed actions and reactions over time and events (Zimmerman, 2002; Hadwin, Jarvela & Miller, 2016; Zimmerman, 2008).
3. since regulation involves cyclical adaptation between three phases (forethought, performance and self-reflection), emphasize regulation as a temporally unfolding process emerging from, and continuing to shape, future beliefs, knowledge, and experiences. Support learners to continually monitor their learning to determine its ultimate value beyond their immediate learning experience (Zimmerman, 2002; Panadero, 2017; Hadwin, Jarvela & Miller, 2016; Zimmerman, 2008).
4. prepare your learner to adaptively respond to new challenges, situations or failure since regulation is socially situated involving dynamic interplay between learners, tasks, teachers, peers, parents, context, and cultures. Regulation emerges when learners engage with personally meaningful learning activities and situations infused with personal meaning, outcome utility, task value, and past experiences (Zimmerman, 2002; Hadwin, Jarvela & Miller, 2016; Zimmerman, 2008).

*Tools and Technologies:* this perspective focuses on the importance of choosing a tool that prioritizes a clear goal setting, and emphasizes self-assessment, and feedback. The need to opt for tools that support visual mechanisms, interactivity, social comparison, and help-seeking, and, finally, the importance of taking into account the cognitive load and employing strategies to balance it when selecting the appropriate tool. For tool and technologies to support effective SRL the following guidelines are suggested:

1. choose a tool that gives importance to clearly setting the goals, to self-assessment and feedback. Use tools in which learners can set their learning goals such as the selection of skills to develop or the definition of activities to be developed on certain dates (Jivet et al., 2021; Broadbent, Panadero & Fuller-Tyszkiewicz, 2020; Pérez-Álvarez, Maldonado-Mahauad & Pérez-Sanagustín, 2018). Use tools that offer textual feedback to the learners through motivational messages, presenting the correct answers to an exercise, time invested, or sending notifications (Jivet et al., 2021; Pérez-Álvarez, Maldonado-Mahauad & Pérez-Sanagustín, 2018).
2. use tools supporting visual mechanisms, interactivity, social comparison and help seeking. This implies to prefer tools which have progress or interaction of the learner with the activities (Taub, et al., 2021; Araka, et al., 2020; Broadbent, Panadero & Fuller-Tyszkiewicz, 2020; Pérez-Álvarez, Maldonado-Mahauad & Pérez-Sanagustín, 2018), that enable shared spaces, forums, chats or by integrating social networks, wikis or blogs, that allow the use of notebooks or support the generation of concept maps for content organization (Jivet et al., 2021; Pérez-Álvarez, Maldonado-Mahauad & Pérez-Sanagustín, 2018).
3. when selecting the suitable tool, consider the cognitive load and apply strategies to balance it. The affordances of self-regulation thus will cause cognitive load amplified by tool learning curve. Consider instructing and providing feedback to students about watching their learning curves (Taub et al., 2021; Broadbent, Panadero & Fuller-Tyszkiewicz, 2020; Pérez-Álvarez, Maldonado-Mahauad & Pérez-Sanagustín, 2018).
4. Use tools that allow users to note their comments, recommendations and inputs. Those tools recommend learning objectives or activities, learning routes, strategies, or tips for SRL or the use of the tool itself, and use some mechanism for allowing data entry by the learner (Broadbent, Panadero & Fuller-Tyszkiewicz, 2020; Pérez-Álvarez, Maldonado-Mahauad & Pérez-Sanagustín, 2018).
5. when choosing a tool, take into consideration not only aspects such as usability and satisfaction, but also accessibility and its impact on learners' self-regulation behavior. Try also to focus on the impact of tools on learners' self-regulation behavior (Urbina, Villatoro & Salinas, 2021).

*Learning Ecologies:* this perspective focuses on the importance of promoting tools and attitudes fostering the development of a Personal Learning Environment (PLE) and of guiding students in constructing a Personal Development Planning (PDP). Additionally, the indications encourage the use of web resources and technologies that support learner autonomy and self-direction, such as current awareness techniques and social networks. For learning ecologies to support effective SRL the following guidelines are suggested:

1. promote those tools and attitudes that lead to the development of a Personal Learning Environment (PLE). Create a personal learning space, with social media and apps enabling students to engage in SRL processes such as goal setting and planning; promote the use of social media to engage in collaborative activities; promote the use of social media to aggregate information in order to reflect on their learning experience (Dabbagh & Kitsantas, 2012; Queiruga Dios, 2021).
2. guide your students in the construction of a Personal Development Planning (PDP). PDP practices encourage self-directed and SRL and also embrace the idea of learning ecologies, because students embrace their own learning plan, following these activities: “thinking and planning, doing, recording, reflecting, evaluating, using the personal knowledge gained to change thinking” (Jasckson, 2015).
3. make a link between formal and informal learning environments with Enterprise Social Network Systems (ESNs). ESNs can create learning environments and support learning also in informal

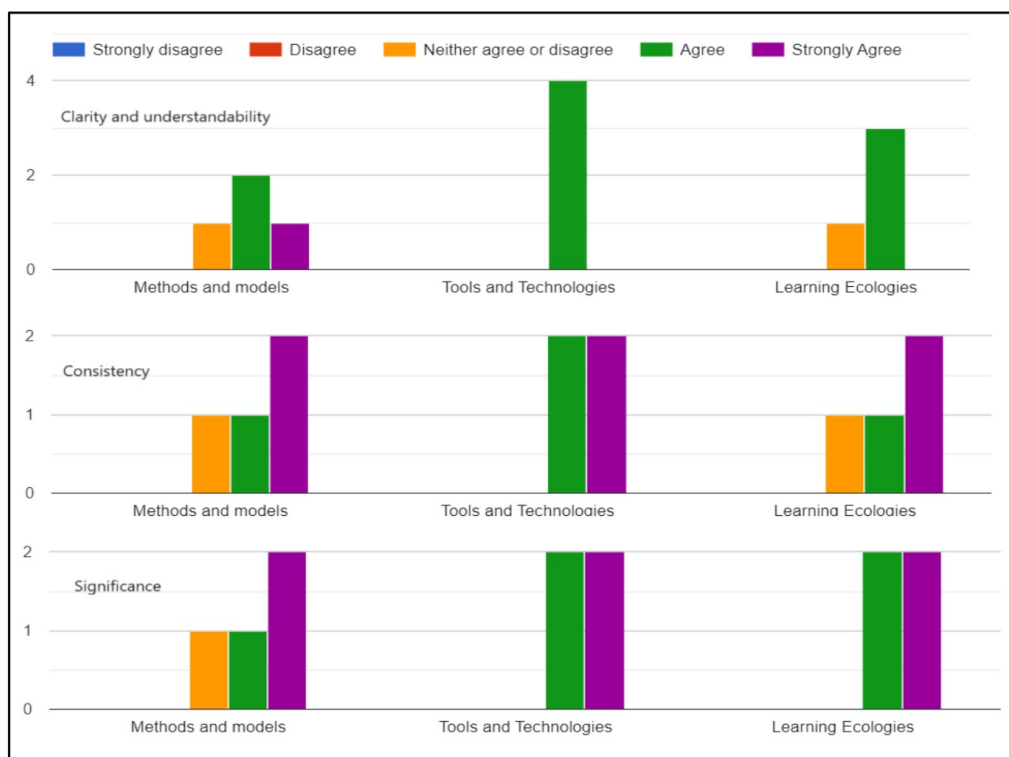
environments: “ESNs can allow students in a formal class group to easily interact with others who are not enrolled in the class but can contribute to their learning” (Scott, Sorokti & Merrell, 2016).

4. encourage the use of web resources and technologies that support learners’ autonomy and self-direction. There are web-enabling services and technologies supporting learning ecologies that permeate formal, non-formal and informal learning, such as: Current awareness techniques, Social networks and communities (Maina & González, 2016).

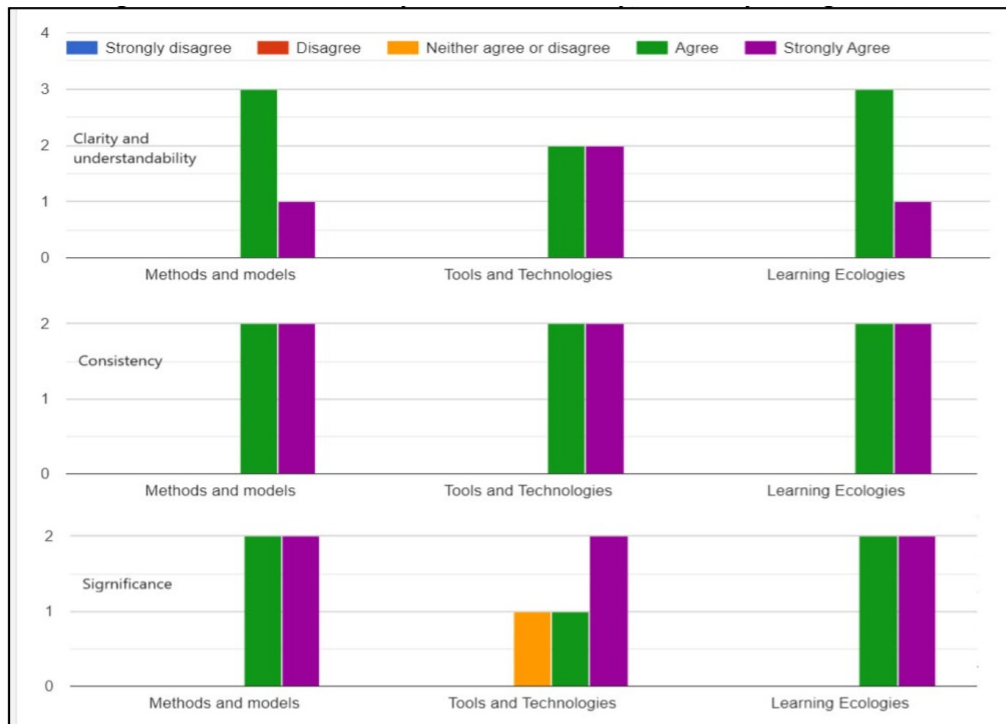
Finally, the results of the validation process showed that there is a large agreement between the responses on the clarity and understandability, consistency and significance of the LD and SRL guidelines from all the perspectives considered (methods and model, tools and technologies and learning ecologies). More in detail, the results revealed a substantial agreement among the experts concerning the clarity and understandability of the LD guidelines, with predominant agreement or strong agreement in all sectors: methods and model, tools and technologies, and learning ecologies. The same widespread agreement is observed in terms of the consistency of the LD guidelines and the significance of the LD guidelines (see Figure 2).

Regarding the SRL guidelines, the clarity and understandability again received a high level of agreement among respondents across all areas. The significance of the SRL guidelines reflects similar results, with respondents majorly expressing their agreement or strong agreement. Additionally, the responses showed a large consensus on the significance of the SRL guidelines, further confirming the broad alignment and satisfaction with the guidelines in every aspect (see Figure 3).

The survey highlighted also an area of improvement, particularly referring to the addition of practical examples for each indication (Expert 1: “*I think that the work is clear and gathers all the important theoretical elements to be taken into account for the learning design. However, I think it is developed from an academic point of view. To serve as a basis for working with teachers I would add practical examples where the theory expressed is put into play. Even images, graphs, diagrams, that help to better visualize what is intended to be said. This would prevent the proposal from being seen in an abstract way with difficulties to see how it works in reality*”). These examples will be added at the end of the testing phase of SuperRED activities in order to provide further support to teachers.



**Figure 2** - LD Guidelines’ clarity and understandability, consistency and significance.



**Figure 3 - SRL Guidelines' clarity and understandability, consistency and significance.**

## 4. Conclusions

In light of the presentation of the SuperRED Framework and its genesis, it's clear that it holds a multi-faceted, integrative approach to bolstering education in the digital arena. With its insights into methods and models and tools and technologies, it advocates for a holistic approach to learning design, underscoring the importance of LD for fostering coherent and effective design experiences for teachers. Moreover, the emphasis on sharing designs for enhancing online collaboration and peer review echoes the commitment to building a robust pedagogical knowledge community. Furthermore, the SuperRED Framework's focus on SRL delineates its learner-centric orientation and shines a light on the multifaceted nature of regulation, underlining the need to engage learners based on their unique purposes, intents, and goals. The emphasis on linking theory and practice, setting personal or personalized course goals, and the adaptive, cyclical nature of learning regulation underscores the framework's dedication to fostering a dynamic, interactive, and supportive learning environment.

Therefore, the SuperRED Framework emerges as an encompassing guide for navigating the intricate terrain of digital education. The comprehensive detailing into each aspect of learning, from the use of methods and models and tools and technologies to the nuanced facets of learning ecologies, demonstrates the framework's robustness and adaptability. It stands as an important reference for educators seeking to enhance their learning design competencies, improve collaboration and community building.

The meticulous process behind the development of the SuperRED framework, involving a comprehensive literature analysis, teachers' involvement, and an expert validation of the draft version, underscores the commitment to delivering a robust and reliable tool for the educational community. It stands as a demonstration to the collaborative efforts of researchers and school partners from four European countries, driving forward the agenda for enhanced digital education and learning experiences.

In conclusion, the SuperRED project may provide a contribution to the evolution of digital and remote education, particularly in enhancing the competences of teachers and students in navigating

the multifaceted landscape of online learning environments. By developing the SuperRED framework, the project may support educators and learners in facing the several challenges of the digital world, offering practical solutions for effective LD and SRL.

## Acknowledgements

This paper has been co-funded by the European Union under project SuperRED (GA 2021-1-IT02-KA220-SCH-000034442). Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.

The authors express their sincere gratitude to the Istituto Tecnologie Didattiche (CNR-ITD), the Delft University of Technology (TU-DELFT) and the Universitat Oberta de Catalunya (UOC) for their valuable contributions and support throughout the research process. We extend our appreciation to Donatella Persico, Francesca Pozzi, Marcello Passarelli, Marcus Specht, Jacqueline Wong, Naomi Wahls, Albert Sangrà Morer, Dèlia Espanol, Marc Romero, for their insightful discussions and feedback that greatly enriched the quality of this work. We would also thank the schools participating in the project: Bernardusscholen (BE), Escola Solc (SP), and Istituto Comprensivo Sarzana-ISA13 (IT), who generously devoted their time and participated in this study.

## References

- Araka, E., Maina, E., Gitonga, R., & Oboko, R. (2020). Research trends in measurement and intervention tools for self-regulated learning for e-learning environments-systematic review (2008-2018). *Research and Practice in Technology Enhanced Learning*, 15(1), 1-21.
- 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.
- Bower, M., & Vlachopoulos, P. (2018). A critical analysis of technology-enhanced learning design frameworks. *British Journal of Educational Technology*, 49(6), 981-997.
- Broadbent, J., Panadero, E., & Fuller-Tyszkiewicz, M. (2020). Effects of mobile-app learning diaries vs online training on specific self-regulated learning components. *Educational Technology Research and Development*, 68(5), 2351-2372.
- 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*, EUR 30559 EN. Publications Office of the European Union, Luxembourg. <https://www.doi.org/10.2760/135208>
- Conole, G. (2012). Design Languages and Learning Design. In: *Designing for Learning in an Open World*. London & New York: Springer.
- Dabbagh, N., & Kitsantas, A. (2012). Personal Learning Environments, social media, and self-regulated learning: A natural formula for connecting formal and informal learning. *The Internet and higher education*, 15(1), 3-8.
- Edisherashvili, N., Saks, K., Pedaste, M., & Leijen, Ä. (2002). Supporting Self-Regulated Learning in Distance Learning Contexts at Higher Education Level: Systematic Literature Review. *Front Psychol*, 2, 792422.
- 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 (IxD&A)*, 45.

- González-Such, J., Perales, M.J., Ortega-Gaite, S., & Sánchez-Delgado, P. (2021). Teachers' Digital Learning Ecologies: School at Home During COVID-19 in the Valencian Region. *Publicaciones*, 51(3), 191-214.
- Goodyear, P., & Dimitriadis, Y. (2013). In medias res: reframing design for learning. *Research in Learning Technology*, 21.
- Hadwin, A., Jarvela, S., & Miller, K. (2016). Self-regulation, co-regulation and shared regulation in collaborative learning environments. In B. Zimmerman & D. Schunk (Eds.), *Handbook of self-regulation of learning and performance* (2nd ed.) (pp. 83-106). Routledge.
- Hernández Leo, D., Martínez Maldonado, R., Pardo, A., Muñoz Cristóbal, J.A., & Rodríguez Triana, M.J. (2019). Analytics for learning design: A layered framework and tools. *British Journal of Educational Technology*, 50(1), 139-152.
- 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>
- Jasckson, N. (2015). Learning Ecologies: Habitats for Self-Directed, Self-Regulated, Learning, Development & Achievement. In *Exploring Learning Ecologies*.
- Jivet, I., Wong, J., Scheffel, M., Valle Torre, M., Specht, M., & Drachsler, H. (2021, April). Quantum of Choice: How learners' feedback monitoring decisions, goals and self-regulated learning skills are related. In *LAK21: 11th international learning analytics and knowledge conference* (pp. 416-427).
- Kurvits, M., Laanpere, M., & Väljataga, T. (2015). Analysis of tools and methods for describing and sharing reusable pedagogical scenarios. In *International Conference on Web-Based Learning* (pp. 251-257). Springer, Cham.
- Laurillard, D., Kennedy, E., Charlton, P., Wild, J., & Dimakopoulos, D. (2018). Using technology to develop teachers as designers of TEL: Evaluating the learning designer. *British Journal of Educational Technology*, 49(6), 1044-1058.
- Maina, M.F., & González, I.G. (2016). Articulating Personal Pedagogies Through Learning Ecologies. *Lecture Notes in Educational Technology*, 73-94.
- Moore, M.G. (1989). Editorial: Three types of interaction. *American Journal of Distance Education*, 3(2), 1-7.
- Mor, Y., Craft, B., & Maina, M. (2015). Introduction. In M. Maina, B. Craft & Y. Mor (Eds.), *The Art & Science of Learning Design*, Sense Publisher.
- Panadero E. (2017). A Review of Self-regulated Learning: Six Models and Four Directions for Research. *Frontiers in psychology*, 8, 422.
- Pelikan, E.R., Lüftenegger, M., Holzer, J., Korlat, S., Spiel, C., & Schober, B. (2021). Learning during COVID-19: the role of self-regulated learning, motivation, and procrastination for perceived competence. *Zeitschrift für Erziehungswissenschaft*, 24(2), 393-418.
- Pérez-Álvarez, R., Maldonado-Mahauad, J., & Pérez-Sanagustín, M. (2018). Tools to support self-regulated learning in online environments: Literature review. In *European conference on technology enhanced learning* (pp. 16-30). Springer, Cham.
- Peters, M., & Romero, M. (2019). Lifelong learning ecologies in online higher education: Students' engagement in the continuum between formal and informal learning. *British Journal of Educational Technology*, 50(4), 1729-1743.
- Pozzi, F., Asensio-Perez, J.I., Cereginì, A., Dagnino, F.M., Dimitriadis, Y., & Earp, J. (2020). Supporting and representing Learning Design with digital tools: in between guidance and flexibility. *Technology, Pedagogy and Education*, 29(1), 109-128.

- Pozzi, F., Ceregini, A., & Persico, D. (2015). "ProgeTTTare" l'apprendimento collaborativo con 4T. *TD - Tecnologie Didattiche*, 23(3), 132-138.
- Pozzi, F., Manganello, F., & Persico, D. (2022). A Study on Teachers' Design Choices Regarding Online Collaborative Learning. In *Proceedings of the 14th International Conference on Computer Supported Education, CSEDU2022* (vol. 2) (pp. 599-605). SCITEPRESS.
- Queiruga Dios, M.Á., Dorrió, J.B.V., Sáiz-Manzanares, M.C., López-Iñesta, E., & Ojeda, M.D. (2021). Assessment of the virtualized self-regulated learning ecology for the Didactics of Natural Sciences during the COVID-19 crisis. *Publicaciones de La Facultad de Educacion y Humanidades Del Campus de Melilla*, 51(3), 375-397.
- 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.
- Santos-Caamaño, F., Vázquez-Cancelo, M.J., & Rodríguez, E.R. (2021). Obstacles in the development of learning ecologies: a challenge for expanded learning in pandemic scenarios. *Publicaciones*, 51(3), 515-531.
- Scott, K.S., Sorokti, K.H., & Merrell, J.D. (2016). Learning "beyond the classroom" within an enterprise social network system. *The Internet and Higher Education*, 29, 75-90.
- SIRD (2020). *Per un confronto sulle modalità di didattica a distanza adottate nelle scuole italiane nel periodo di emergenza COVID-19*.  
[https://www.sird.it/wp-content/uploads/2020/07/Una\\_prima\\_panoramica\\_dei\\_dati.pdf](https://www.sird.it/wp-content/uploads/2020/07/Una_prima_panoramica_dei_dati.pdf)
- Taub, M., Azevedo, R., Rajendran, R., Cloude, E.B., Biswas, G., & Price, M.J. (2021). How are students' emotions related to the accuracy of cognitive and metacognitive processes during learning with an intelligent tutoring system?. *Learning and Instruction*, 72, 101200.
- Urbina, S., Villatoro, S., & Salinas, J. (2021). Self-Regulated Learning and Technology-Enhanced Learning Environments in Higher Education: A Scoping Review. *Sustainability*, 13(13), 7281.
- Zimmerman, B.J. (2002). Becoming a Self-Regulated Learner: An Overview. *Theory Into Practice*, 41(2), 64-70.
- Zimmerman, B.J. (2008). Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. *American educational research journal*, 45(1), 166-183.