

# Supporting Self-Regulated Learning with ICT

S

**Giuliana Dettori**

*Institute for Educational Technology, National Research Council, Italy*

**Donatella Persico**

*Institute for Educational Technology, National Research Council, Italy*

## INTRODUCTION

Technology has been speeding up the pace of change in our lives, forcing us to quickly come to terms with new knowledge and new tools in both formal and informal learning contexts. In the past two decades, this phenomenon has increased interest in self-regulated learning (SRL), a crosscurricular competence which supports lifelong learning by helping people become independent learners and by favouring the transfer of learning strategies and problem solving methods to different learning situations. SRL is also seen as a way to avoid “inert knowledge” (Whitehead, 1967), that is, knowledge that students have acquired but are unable to apply.

Research has shown that students who lack SRL competence not only have poor academic results but also show behavioral problems and difficulties in expressing their thoughts and feelings and in understanding those of others (Sanz de Acedo Lizarraga, Ugarte, Cardelle-Elawar, Iriarte, & Sanz de Acedo Baquedano, 2003). Therefore, it is not surprising that developing students’ self-regulatory competence, in addition to teaching them content knowledge, is increasingly considered a major goal of education and an important field of educational research.

In this chapter we investigate whether ICT tools can support the practice and development of SRL and, if so, under what conditions. More specifically, we discuss what features of such environments are likely to favour SRL.

## BACKGROUND

We can define self regulated learning (SRL) as a learning process where students master their own learning by setting their own goals, by choosing and changing their learning strategies when necessary, by reflecting

on their own learning and in particular by evaluating their progress and consequently adapting their strategies. Self-regulated learners are often intrinsically motivated (Young, 2005) and see learning as a proactive activity; in other words, they *deliberately control* rather than *passively endure* the learning process. They usually have a good degree of self-efficacy and are able to apply and adapt the acquired knowledge across different subjects. According to Zimmermann (1998), SRL “is not a mental ability, such as intelligence, or an academic skill, such as reading proficiency; rather, it is the self-directive process through which learners transform their mental abilities into academic skills.” The research in this field investigates the pedagogical, behavioral, emotional, motivational, cognitive and metacognitive aspects involved when students control their own learning processes (Zimmermann, 2001).

We will base our discussion on a widely accepted model, derived from studies of sociocognitive orientation (Steffens, 2006; Zimmerman, 1998). According to this view, SRL entails an active and conscious control of one’s learning in terms of cognition (including metacognition), motivation and behavior, at both individual and social level. This approach also points out that SRL consists of a cyclical repetition of three phases, each of which provides input to the following one: forethought or planning; performance (which includes execution and monitoring); and evaluation of the achievements in relation to learning objectives. Self-regulation is then brought about by controlling metacognition, motivation, and behavior throughout these three cyclical phases. By systematically proceeding in this way, the students begin to adapt knowledge and competence acquired in previous learning experiences to new learning situations, in order to reach their current learning objectives. This characterization of SRL points out that learners’ previous knowledge plays an important role in the practice of SRL in that it provides a starting point that learners can use to

tackle new problems. It also suggests that SRL is a competence that improves more rapidly as people progress in education. Some studies, however, suggest that SRL does not improve quickly or spontaneously (Boekaerts, 1997), but requires suitable teaching and practice. The literature reports improvement in learning when self-regulation is explicitly addressed in classroom instruction (Schunk & Zimmerman, 1998). It also underlines the importance of creating and structuring favourable learning environments which stimulate reflection and revision, provide meaningful feedback and help learners to feel responsible for their own activity and achievements (Dettori, Giannetti, & Persico, 2006).

## **ICT-BASED ENVIRONMENTS AND SRL**

Is it possible to understand the potential support to SRL provided by technology-enhanced learning environments (TELE) by analysing their features and the way they are used? To what extent does such support depend on the features of the software tools and to what extent does it depend on the way they are configured and used?

Such questions were addressed by a group of researchers from nine countries within a European project called TELEPEERS (1), which focused on TELEs of various kinds, from offline self-instructional programs to online collaborative courses. To guide the analysis of the TELEs, the TELEPEERS partners identified a set of features that, according to the literature, are desirable when SRL practice and development are among the learning objectives. The standpoint of this project was that the analysis should focus not only on the software component but also on its mode of use, since these two aspects are so strictly intertwined that their effects are too difficult to separate. Based on the aforementioned features, TELEPEERS also produced and tested two questionnaires (2). The first is meant to be used by teachers and/or SRL experts for an a priori evaluation of the TELE's potential, while the second is addressed to the TELE's users and allows a posteriori assessment of the tool and its use.

Based on the project outcomes, we further elaborated the TELEPEERS set of features and came up with the checklist in Table 1. This list, in addition to items referring to the three cyclical phases of SRL control identified

by Zimmermann (planning, execution, and monitoring, and self-assessment), also includes a section on general features of the TELE structure and interface.

For the sake of generality, the list contains aspects that can be relevant for some kind of TELEs, but not necessarily for all of them. In order to clarify the possible meaning of the selected features in different situations, we will comment on two very different cases of TELEs, that is, virtual collaborative environments to run online courses and programs for individual use.

## **SRL in Virtual Environments for Online Collaborative Learning**

The relationship between SRL and online collaborative learning is rather complex, since the latter appears to both support and require the former (Dettori, Giannetti, & Persico, 2006).

The fact that online collaborative learning supports SRL is suggested by three considerations:

- Online learning allows greater freedom of choice than face-to-face instruction (Williams & Hellman, 2004) since students can decide, at the very least, where and when to study, and often how to organize their activity. According to Boekaerts (1999), the perception of choice encourages self-regulation.
- In online collaborative courses, discussion and comparison with peers play a key role. According to Bolhuis (2003), social experiences in general (not only online) are an important source of SRL competence.
- The need to put in writing one's thoughts and reflections, according to Kanselaar, Erkens, Jaspers, and Tabachneck-Schijf (2001), encourages reflection and assumption of responsibility.

On the other hand, self-regulation appears necessary to help students take advantage of online courses. In particular:

- Commitment, feeling of responsibility, reflection and the ability to plan the learning activity are even more important in online experiences than in traditional ones, in fact, satisfactory achievements in online contexts heavily depend on these aspects. As a consequence, students who are not used to

5 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: [www.igi-global.com/chapter/supporting-self-regulated-learning-ict/13429](http://www.igi-global.com/chapter/supporting-self-regulated-learning-ict/13429)

## Related Content

---

### DeLone & McLean IS Success Model in Evaluating Knowledge Transfer in a Virtual Learning Environment

Raija Halonen, Heli Thomander and Elisa Laukkanen (2010). *International Journal of Information Systems and Social Change* (pp. 36-48).

[www.irma-international.org/article/delone-mclean-success-model-evaluating/42114](http://www.irma-international.org/article/delone-mclean-success-model-evaluating/42114)

### Artificial Intelligence-Driven Adaptive Learning for Business English: A Personalized Training Framework Based on Learner Analytics

Bo Ning and Li Huang (2026). *Journal of Cases on Information Technology* (pp. 1-19).

[www.irma-international.org/article/artificial-intelligence-driven-adaptive-learning-for-business-english/411178](http://www.irma-international.org/article/artificial-intelligence-driven-adaptive-learning-for-business-english/411178)

### ICT for Knowledge and Intellectual Capital Management in Organizations

Jacques Bulchand and Jorge Rodríguez (2008). *Information Communication Technologies: Concepts, Methodologies, Tools, and Applications* (pp. 1561-1580).

[www.irma-international.org/chapter/ict-knowledge-intellectual-capital-management/22759](http://www.irma-international.org/chapter/ict-knowledge-intellectual-capital-management/22759)

### Experiment 1: On Reading Process of Schoolbook in Two Formats (Electronic and Paper Formats)

Azza A. Abubaker and Joan Lu (2017). *Examining Information Retrieval and Image Processing Paradigms in Multidisciplinary Contexts* (pp. 185-203).

[www.irma-international.org/chapter/experiment-1/177703](http://www.irma-international.org/chapter/experiment-1/177703)

### A Case of Information Systems Pre-Implementation Failure: Pitfalls of Overlooking the Key Stakeholders' Interests

Christoph Schneider and Suprateek Sarker (2005). *Journal of Cases on Information Technology* (pp. 50-66).

[www.irma-international.org/article/case-information-systems-pre-implementation/3147](http://www.irma-international.org/article/case-information-systems-pre-implementation/3147)