ANALYSIS AND DEVELOPMENT OF SELF-REGULATED LEARNING FACTORS IN E-LEARNING SYSTEMS

Francesco Casella - Margherita Fasano
University of Macerata - University of Basilicata

abstract

The research "Analysis and development of self-regulated learning factors in e-learning systems" has been developed in the PhD programme "E-learning and Knowledge Management" at the University of Macerata. This research aims to identify the factors which determine and/or influence the self-regulation learning process and to check how much the development of the self-regulation process may positively influence learners in e-learning courses. **Self-regulation** in traditional learning environments has been widely studied while few research regards online environments. Self-regulation requires the activation of important **metacognitive processes** whose strength depends on the e-learner's personal features, on the relationship among variables and on the feedback quality. Self-regulation has important psychological, didactic and pedagogical implications. It is a goal to be achieved in the learning process and it is sometimes taken for granted. There is a merge of **factors** in it. They are related to the **rational**, cognitive dimension. They are expressed through logic speech form, by using sentences which are mainly declarative. There are also factors which are linked to the **emotional-motivational** dimension, whose control can lead either to the motivation in pursuing the training path or to refusal and demotivation. In our research, a survey through an online questionnaire has been carried out in order to verify the presence/absence of self-regulated actions by the e-learners who have attended an online course to achieve a qualification. Data processing will allow us to verify the quantitative and qualitative dimension of self-regulated processes. As for the applied part of the research, it will be possible to plan and experiment ways to sustain the self-regulated process. In particular the feedback in e-learning environments, aiming at developing the learner's self-assessment attitude, will be considered.

Aims and field of research

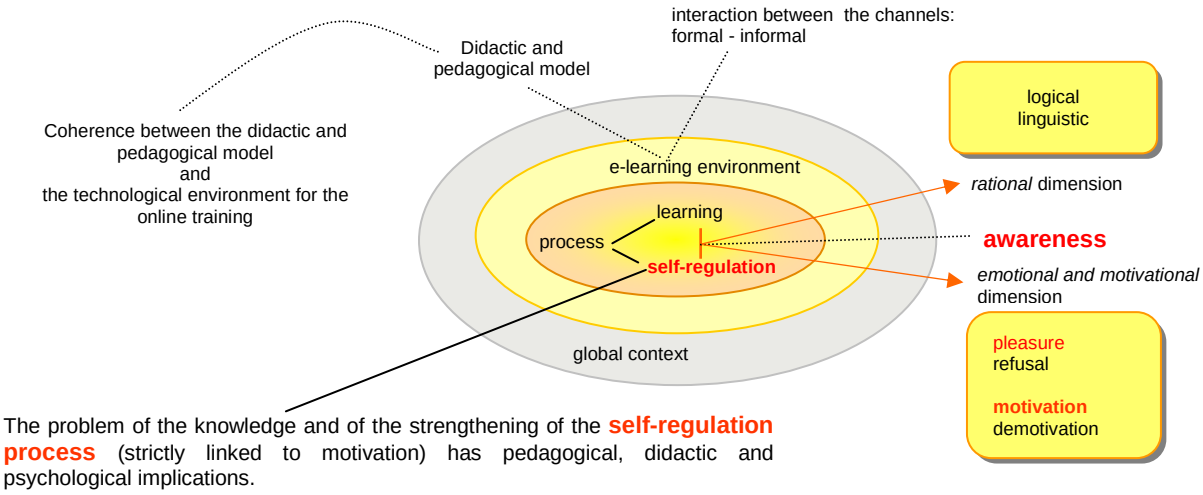
The research "*Analysis and development of self-regulated learning factors in e-learning systems*" has been developed in the PhD programme "*E-learning and Knowledge Management*" at the University of Macerata, coordinated by Prof. Rossi. This research aims at identifying the factors which determine and/or influence the self-regulated learning process and to check how much the development of the self-regulated process may positively influence learners in e-learning courses. Self-regulation in the learning process has been widely studied especially for traditional learning environments, while few research regards online environments. Self-regulation in the learning process requires the activation of important metacognitive processes whose strength depends on the e-learner's personal features, on the relationship among variables and on the feedback quality. Self-regulation has important psychological, didactic and pedagogical implications. It is a goal to be achieved in the learning process and it is sometimes taken for granted. There is a merge of factors in it. They are related to the rational, **cognitive dimension**. They are expressed through logic speech form, by using sentences which are mainly declarative. There are also factors which are linked to the **emotional-motivational dimension**, whose control can lead either to the motivation in pursuing the training path or to refusal and demotivation.

Experts in didactics and researchers have been paying attention to the issue of self-regulation in learning for a few years, in conjunction with the technological speed-up in the fields of the communication media and of the Internet. The latter certainly offers many chances to learn, both from formal and informal sources. The Internet provides a varied background context; for this reason it is evident that learners need to strengthen their self-regulated learning processes in order to achieve a wide range of objectives.

The Internet offers many opportunities and huge resources for the users' training, also in terms of freedom and management of the learning process. These advantages can remain outward if

the e-learner has not developed a strong self-regulation competence, on which the skill of autonomous and responsible management of the learning process is based [Shunk e Zimmerman, 1998].

In the international literature, the presence of a self-regulation skill has been associated to academic success [Shunk e Zimmerman, 1998] while the lack or a huge deficiency of a self-regulation skill has been associated to problems and difficulties in social relationships [Sanz de Acedo Lizarraga, 2003]. Moreover, the physical absence of the instructor and the increase in the learners' responsibilities in facing many learning tasks can create a lot of difficulties, especially for those with low self-regulation skills (Dabbagh and Kitsantas, 2005). In other research, it has been pointed out that, in online learning environments, the students with a huge self-regulation competence become more responsible as regards their learning process and more **intrinsically motivated** (Chang, 2005).



In the first phase of the research, the theoretical frame has been defined, starting from the following references:

Lowick, who had been studying the cognitive processes and the constructive aspects of human learning since 1990s, stated that the objectives to be achieved in open, flexible, active and interactive systems are "a meaningful knowledge, powerful cognitive strategies and **self-regulation processes**";
Shunk e Zimmerman (1988) defined and considered the Self-Regulated Learning as a cross-competence, which helps the individual in the management of his/her own learning process. This management would be possible thanks to the activation of metacognitive and emotional behaviours, both on an individual and on a social level;
Azevedo e Hadwin (2005) who started to write about conceptual, metacognitive and strategic along the learning process;
Cornoldi, Pazzaglia e Mammarella (2004), who have pointed out, analysing in particular multimedia learning, the role both of the *reflections* that the subject carries out along the learning process and of the **self-regulation**, as ability to check his/her own training, related to his/her own needs;
Calvani (2000), talks about "reflection" areas, to be strengthened in the online communities of learners;
Rossi (2006), who points out the importance of the individual reflection, related to the progress of learning (the building of an e-portfolio);
SRL– Self-Regulated Learning (Zimmerman e Pellerey (2003); Schunk, D. H. (2005);

Vasilyeva, Pechenizkiy, De Bra (2007), who have studied **feedback** in e-learning: *Adaptation of Feedback in e-learning System at Individual and Group Level*.

Research in Italy about self-regulation

A research on the importance of self-regulation was carried out inside the European project TELEPEERS (Giannetti, 2006). The research examined the functionalities favouring **self-regulated** learning (support inside the environment, support in planning, in the fulfilment of the task and in the assessment of the performed work).

Actual phase of the research

In our research, a survey through an online questionnaire has been carried out in order to verify the presence/absence of self-regulated acts in e-learners which have attended an online course to achieve a qualification in the latest four years. Data processing will allow us to verify the quantitative and qualitative dimension of self-regulation processes. As for the applied part of the research, it will be possible to plan and experiment ways to sustain the self-regulation process, in particular on feedback in e-learning, aiming at developing the learner's self-assessment attitude.

Expected results and research hypotheses

The expected results of the research are the **understanding of the role played by the factors** characterizing the self-regulated learning process in online didactic systems and, afterwards, the identification of **support systems** that can help the self-regulation device of the e-learner, who will always need to develop thoughtful abilities, action strategies and selective exploration of information sources strategies, in order to more effectively achieve his/her own learning objectives. Besides the reflection about the efficacy of the used strategies, the e-learner will have to learn how to manage the connection times, to estimate the numerous environmental feedbacks and to answer in a suitable manner to the various stimuli during the learning process.
The e-learner, will need some knowledge and tools to manage the course; to change, in case, the direction; to take some decisions about the actions to improve the journey conditions as regards the planned destination. In one word, he/she will have to be able to self-regulate his/her own behaviour, related to both the environmental stimuli and the adopted strategies.
For these reasons, it is necessary that the planning and the implementation of a support and strengthening system of the self-regulated learning process can be useful to the e-learner in order to check and consciously manage his/her own training process with the context of a wide network and spread knowledge.

Bibliography and sitography

Azevedo R., Hadwin A. F. (2005), *Scaffolding self-regulated learning and metacognition.*

Implications for the design of computerbased scaffolds, Instructional Science, n. 33, pp. 367-379.

Bandura A., Autoefficacia. Teoria e applicazioni, Edizioni Erickson, Trento;

Benoit Galand, Etienne Bourgeois, Mariane Frenay, *The impact of a PBL curriculum on students'*

motivation and self-regulation, Unesco Chair of University Teaching and Learning, Université catholique de Louvain This text is based on a presentation in D. Bédard (Chair), Pedagogical innovation in higher education and its impact on student learning and motivation (2003);

Calvani A., Rotta M., *Fare formazione in Internet*, Gardolo, Erickson 2000;

Chee-Kit Looi, G. Mccalla, B. Bredeweg, J. Breuker (2005), Artificial Intelligence in Education,

http://books.google.it/books?id=bR1pKYNcHA4C&pg=PA168&dq=pedagogical+agent (visto in data

3/11/2008);

Cornoldi-Pazzaglia- Mammarella (2005), *Psicologia dell'apprendimento multimediale*, il Mulino, Bologna

Isaacson, R. J., & Fujita, F. (2006). *Metacognitive knowledge monitoring and self- regulated learning: Academic success and reflections on learning*, Journal of the Scholarship of Teaching and Learning, 6, 39- 55;

Ley, K. and Young, D.B. (2001) *"Instructional principles for self-regulation", Educational Technology Research and Development,* Vol. 49, No. 2, pp. 93–103;

Mark McMahon (2002) *Designing an on-line environment to scaffold cognitive self-regulation,*

http://www.ecu.edu.au/conferences/herdsa/main/papers/ref/pdf/McMahon.pdf (26/10/2008);

Paris S. G., Winograd P. (2001), *The role of self-regulated learning in contextual teaching: Principles and practices for teacher preparation*,

http://www.ciera.org/ library /archive/2001-04/0104parwin.htm

Perels, F., Gürtler, T. and Schmitz, B. (2005) "Training of self-regulatory and problem-solving competence", Learning and Instruction, Vol. 15, No. 2, pp. 123-139

Paris, S.G. and Paris, A.H. (2001), "*Classroom applications of research in self-regulated learning*", Educational Psychologist, Vol. 36, No. 2, pp. 89-101.

Ranieri M. (2007) , *E-learning: modelli e strategie didattiche,* Trento*,* Edizioni Erickson;

Rivoltella P. C., *Costruttivismo e pragmatica della comunicazione on line*, Edizioni Erickson, Trento 2007;

Rossi P.G. - Lorella Giannandrea (2006), *Che cos'è l'e-portfolio,* Carocci, Roma;

Schloemer, P. (2006). *From students to learners: Developing self-regulated learning*. Journal of Education for Business,82, 81-87;

Schunk, D. H. (2005). *Self-regulated learning: The educational legacy of Paul R. Pintrich*. Educational Psychologist, 40, 85-94;

Shen P D, Lee T H, and Tsai C W (2007) , *Applying Web-Enabled Problem-Based Learning and Self-Regulated Learning to Enhance Computing Skills of Taiwan's Vocational Students: a Quasi-Experimental Study of a Short- Term Module*" The Electronic Journal of e-Learning Volume 5 Issue 2, pp 147 - 156, available online at www.ejel.org;

Tania Riannetti, *Autoregolazione dell'apprendimento e tecnologie didattiche*, CNR,

http://www.itd.cnr.it/TDMagazine/PDF37/giannetti.pdf (19/09/2007);

Van Den Boom G., Paas F., Van Merrienboer J. J.G., Van Gog T. (2004), *Reflection prompts and tutor feedback in a web-based learning environments: effects on students' self-regulated learning competence*, Computer in Human Behaviour, n. 20, pp. 551-567;

Vasilyeva E., Pechenizkiy M., De Bra P., (2007), *Adaptation of Feedback in e-learning System at Individual and Group Level*,

http://www.als-project.org/download.php?8678961e586ff00cc21e1470a2080a53 (3/10/2008);

Winnie P. H. (2005), *A perspective on state-of-the-art research on self-regulated learning*, Instructional Science, n. 33, pp. 559-565;

Zimmerman B.J. (1998), Developing self-regulation cycles of academic regulation: an analysis of exemplary instructional models, in D.H. Schunk, B.J. Zimmerman (eds.) Self-regulated learning, from teaching to self-reflective practice, New York, The Guilford Press, pp.1-19;

Zimmerman B.J. (2001), Theories of self-regulated learning and academic achievement: an overview and analysis, in B. J. Zimmerman & D.H. Schunk (eds.), Self-regulated learning and academic achievement, Mahwah, NJ, Lawrence Erlbaum Associates, pp.1-37.