

SELF REGULATED LEARNING STRATEGIES IN GROUPS OF LEARNERS

Jenny Pange

University of Ioannina (Greece)

Abstrac

The technological revolution gives the opportunity to upgrade the quality in education, through new ways of learning. Self-regulated learning is an active and constructive process where self regulated learning proposes learning strategies in monitoring regulations. The aim of this study was to investigate the process and the benefits of the application of self-regulated learning to groups of learners. Findings of this study, demonstrated that self regulated learning in groups of students effectively regulated the learning process of all participants in the study.

KEYWORDS: self regulated learning, nearest neighbour learning, learning model, collaborative learning, ICT.

Anotacija

Technologinė revoliucija suteikia galimybę pagerinti švietimo kokybę, pasitelkiant naujausius mokymosi būdus. Savireguliacinis mokymasis – tai aktyvus ir konstruktyvus procesas, kuriame pasitelkus savireguliacinį mokymąsi siūlomos priežiūros reguliavimo strategijos. Šiuo tyrimu siekta iširti savireguliacinio mokymosi procesą ir jo taikymo naudą studentų grupėms. Tyrimo rezultatai parodė, kad savireguliacinis mokymasis padėjo efektyviai reguliuoti mokymosi procesą visiems tyrimo grupėse dalyvavusiems studentams.

PAGRINDINIAI ŽODŽIAI: savireguliacinis mokymasis, artimiausio kaimyno mokymasis, mokymosi modelis, mokymasis bendradarbiaujant, informacinės technologijos.

Introduction

Every educational system, aims to promote and facilitate student's learning. To reform and uphold an educational system a change in the ability of students' learning has to be applied. Quality in education is related with transformation and improvement of learning. Amongst the most popular and well known teaching and learning strategies, that can be used for learning are: collaborative learning, cooperative learning, discovery-based learning, engaged learning, problem-based learning and so on. According to Gamson (1994, p. 8), "collaborative learning is always cooperative, but takes students one step further; to a point where they must confront the issue of power and authority implicit in any form of learning but usually ignored". In engaged learning process, students are involved from the very first day, on the course material. They discuss, create projects, use technology and participate in the learning process. The teacher serves as a "coach or facilitator", guiding students to the desired goal. Obviously, in all these processes students cooperate with classmates and take care personally for their studies.

Currently, there is a growing interest on the application of ICT as part of the transformation process of teaching and learning. Historically, since 1970, ICT have been considered by educators, as an important component of teaching in many European universities (Means, 1994; Mumtaz, 2000; Pange, 2002). Obviously, ICT can provide many opportunities to the teaching and learning process and they have changed the way learners learn so, new methods and new approaches are developed (Campbell et al., 1992; Pange, 2002; Shayer, Adey, 1981). Information transfer using ICT, implies effectiveness and efficiency. Many researchers (Chen, 1995; Pange, 2010), agree that ICT as a new technological tool enables us to change from a mechanistic to a humanistic view of education through developing learner-tailored curricula, decentralizing learning in time and space and developing a system of cybernetic educational management. Additionally, emphasis is given on methods of individual base of learning and discussion is based on groups with relevant learning interests.

It is well documented that technology-supported learning, consists of social theories of learning, including self regulated learning, with an attempt to combine them with the technical features of the media (Pange, 2007). As learning in our days requires proper management of time and recourses, self regulated learning becomes predominant and apparent (Bartolome et al, 2011; Lefrere, 2011). More and more educators at all levels of education are trying to include self regulated learning in the learning process (Dignath van Ewijk et al, 2012; Kramarski et al, 2009). It is also worth pointing here that life-long-learning nowadays is mostly provided by informal settings where technology plays an important role and self regulated learning is apparent (Beishuizen et al, 2011). The use of technology and specially the use of collection of widgets for goal setting, time management and personal management, transforms self regulating learning into a personalized procedure (Nussbaumer et al, 2012) According to recent studies (van Ewijk et al, 2012) teachers can use different ways of instructions to support their students' self-regulation strategies and there are direct and indirect ways to do so. Additionally, on a large scale, digital technologies influence personalized learning (Underwood et al, 2008). Even though self-regulated learning is applied by teachers to enhance students' learning on a personalized way, there are not any studies in the recent literature review addressed on the application of self-regulated learning to groups of students where digital technologies are apparent.

Self-regulated learning refers to one's capacity to comprehend and control, learning procedure. Zimmerman (1998) defines self-regulation learning as one's "self-generated thoughts, feelings, and actions for attaining academic goals". Self-regulated learning is a composite process where the learner monitors and controls his/her performance in order to achieve the desired outcome and it is a self-direc-

tive process. According to Zimmerman, et al (2002), as cited in Cheng (2011) in this process learners transform their mental abilities into skills. Zimmerman, et al (2002) suggested a model in self regulated learning comprised of four correlated processes the following: “Self-evaluation and monitoring, Goal setting and strategic planning, Strategy implementation and monitoring, Strategic outcome”. Zimmerman and Martinez-Pons (1986) using learners’ opinions on the procedure of learning strategies, developed an integrated strategy, based on a self-regulated learning strategy, including self-testing, organizational transformation, goals and planning, pursuing information, recording and checking, structured environment, strength, demonstration and memory, seeking help, and reviewing strategy. Boekaerts (1999) defines self-regulated learning as a series of equally related cognitive and affective processes that works together on different components of the information processing system.

According to Pintrich (2000), self-regulated learning is an active and constructive process in which learners primarily set their goals and then they try to monitor, regulate and control their cognition, their motives and their behaviors guided by their goals and the structural characteristics of environment. Pintrich (1999) model of self-regulated learning includes three general categories of strategies: cognitive learning strategies, metacognitive control and resource management strategies.

Self-regulated learning puts emphasis on autonomy and control of learners who observe, direct, and regulate actions toward their goals for self-improvement (Paris and Paris 2001). Self-regulated learners are aware of their strengths and weaknesses, and they control and regulate their own actions towards their learning goals.

Finally, self regulated models emphasize on learning as a process in which learners think, experience and act on their own way in order to achieve their learning goals. In this process, learners implement strategies by which they choose, use, monitor and adjust learning strategies and employ the strategies to control action in order to achieve specific learning goals. So, this process involves learners’ learning motivation, goal setting, action control and learning strategies.

Recent research on self-regulation is mainly focused on the different systems and processes that observe and control behavior and on the actual use of self-regulated learning strategies in academic settings (Papantoniou et al., 2010). Although over the last decades, many researchers have investigated self regulated learning for individual learners (Zimmerman, 1998; Pintrich, 2000; Papantoniou et al., 2010), there are not any findings concerning self regulated learning for self selected groups of learners.

Self selected groups of learners work well in life long learning procedure, adult education and continuing professional development where students face and work

with real life problems (Pange, 2007). According to ECC (2001) declaration, “life-long learning” is: “All learning activities undertaken throughout life, with the aim of improving knowledge, skills and competences within a personal, civic, social and/or employment-related perspective.”

Moreover, learners nowadays, know that change in information is so rapid that some knowledge becomes out of date as soon as it is mastered so, working in groups they are able to exchange information, explain ideas and share experiences. According to (Dogoriti, Pange, 2012) students learn faster English as a foreign language, when they form groups and use social media (facebook). In these terms, the existing knowledge-transfer system is improved with the presence of ICT and prepares students for a complex world with a constant change. This way, a new learning environment raises for self regulated learning, and it has to be considered in a more composite way, where learning turns out to be a synergetic process, adopting a new, fully ICT designed pedagogy.

The aim of this study is to investigate self regulated learning, according to Zimmereman et al (2002) four stage model described above, when applied to self selected groups of undergraduate students using ICT and also to give information to teachers about the procedure and the learning outcomes.

1. Materials And Methods

This study has been applied to ten self selected groups of learners (undergraduate students) consisted of 4–7 students each, for an academic year.

The groups were not predefined by the teacher, but the students were free to form their groups. The structure of the groups was based on self selection and according to nearest neighbour learning method (Pange, 2007). According to this method, students were free to choose by themselves how to form the groups, given that they had to be convinced in their group and able to complete the course requirements (Toki, Pange, 2006, 2007). This process took place during the first month of the course. During this time, students were free to reform groups or to move from one group to another, if the group they were in did not meet all their expectations.

All learners were undergraduate students attending the subject of ICT in education in the School of Education, in the University of Ioannina Greece.

When the groups were finally formed, tasks of the teacher were given according to course curriculum. Teacher had a strong knowledge on content, and pedagogical content knowledge. Students were not obliged to attend all lectures of the course, that were given once a week, but they were obliged to study the course material with their classmates in the group they were in. Planning of group work-

load for the whole semester was made for each group separately by the teacher and students made decisions about: a) analysis of learning tasks, b) setting specific goals, c) creating learning plans and d) defining learning strategies.

2. Research Design

A case study was used to determine the relationship between students' group self-regulated learning and their learning effectiveness.

According to strengths and limitations of case studies it is important to be mentioned here that a case study is valuable when investigating complex social units consisting of many variables, and in understanding the observable facts in real-life situations. It offers insights for future research; and is a particularly attractive design for studying educational improvement, and /or other new programs. But as case study focuses on a single unit, or on a single case, the issue of generalizability emerges crucial than with other types of qualitative research.

The data was collected directly from all participants via interviews, tests and questionnaires. Students were asked keep records on their learning process. In these records they asked to describe the way they planned, formed, and conducted their learning as a group, the strengths and limitations as participants in the group, identifying strengths and limitations of self regulated learning as single participant and as group learners. All statements were measured using a 6-point Likert-type scale ranging from 1 (strongly disagree) to 6 (strongly agree).

For the purpose of this study, students evaluated:

- the course requirements twice (beginning and mid-time of semester) on a scale 1–2 (workload acceptable = 1, non acceptable or a large amount of workload = 2);
- the participation satisfaction in their group (mid-time of semester and end of semester) on a scale 1–2 (satisfied = 2, non-satisfied = 1);
- the homework presented in class meetings every week during the semester of their own group and all other groups' progress on a scale: 1 to 10 (8–10 = excellent, 6–7 = moderate, acceptable, 1–5 = unacceptable).

At the end of the academic year, all groups of students made evaluations on a scale 1 to 3 for their group performance (1 = above average, 2 = average and 3 = pass) and general satisfaction (1 = unsatisfied, 2 = moderate satisfied, 3 = very satisfied) on:

- Fulfilment of personal learning outcomes (ICT knowledge, skills, attitudes).
- Effectiveness of learning as a team.
- Learning outcomes as groups (ICT knowledge, skills, attitudes).

Then the teacher evaluated the overall performance of all groups of students and every student separately, on grade scale 0–10. Groups were evaluated according to their performance as group during the semester (knowledge, skills, attitudes), and every student was assessed on a final exam at the end of the academic year.

All evaluations were collected and analysed using M. Excel and R statistical package

3. Results and Discussion

All students worked in groups with enthusiasm, and they developed a close relationship (in many cases they developed a strong friendship). The course requirements were accepted by 95 % of the total number in this case study, we developed student’s self-regulated learning concept through concrete groups where self-regulating strategies were applied.

In this case teacher demonstrated how to conduct self regulation in groups and proposed strategies to each group separately giving directed instruction. Instruction was based according to the answers of the students on participation satisfaction. Students were satisfied in their group at mid-time of semester at 70 % (table 1) and at the end of the semester at 82 %.

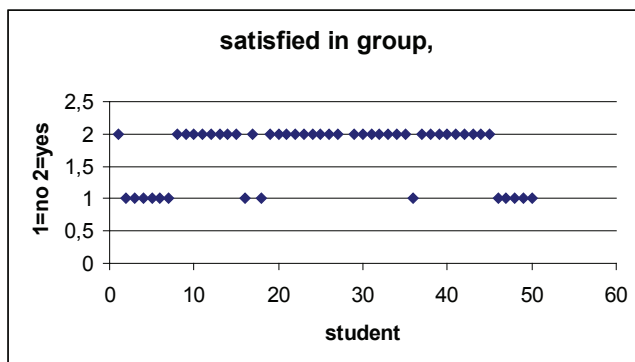


Figure 1

In these groups, according to Zimmerman and Paulsen (1995), they targeting their learning activities, shared together their ideas and their questions about the course. The students’ groups were homogeneous, according to their age (21 ± 3 Years), sex (95 % females) and knowledge/application of ICT (ICT use 99 %).

In these groups, all students developed their own language of communication, and according to their records, they used emails 95 %, facebook 99 %, viber 35 %, instant messages and mobiles 100 % (Fig. 2).

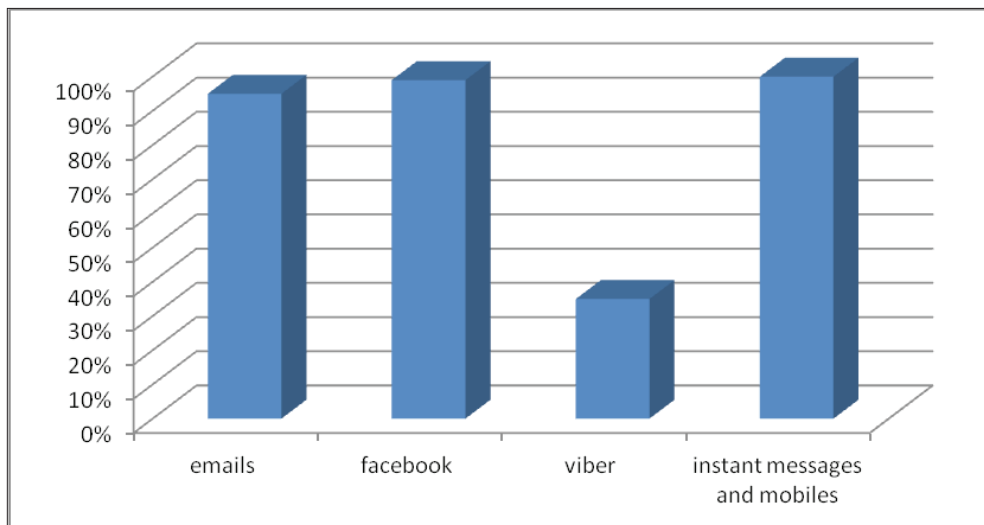


Figure 2

It is remarkable the role played the presence of ICT (computers, internet, emails, mobile phones, etc) and how they facilitated the communication of the group members. Students in our days are technology natives so, the presence of ICT in a learning process facilitates learning. According to the data of the records kept of each one group, all groups followed the four steps of developing self-regulating ability, as stated by Zimmerman and Paulsen (1995), adapting it in their own way. Analytically, all groups set up their own benchmark level, they observed their own learning process according to model provided by the teacher to each group, they developed, applied and targeting their own learning mechanisms and activities, according to the ambitions, abilities and orientations of all group members.

It was found that the benchmark level in every group, for all groups, was above average of the total expectations of every single member of the group.

According to the answers of students, it was found that their work in the group was very satisfied especially in Fulfilment of personal learning outcomes (82 %), Effectiveness of learning as a team (90 %), Learning outcomes as group (96 %)

Students said that when they worked in groups they found more learning mechanisms, more learning activities and the time spend as team work was stimulating than as single learners.

It was found from their answers to questionnaire that they spend more time (80 % more) in reading material as group than as single learners, they developed their own learning mechanism, and they targeting as group, almost 30 % more

learning activities than as single users. They decided to record all learning material and time spend in reading so, they read articles online concerning the course (98 %) and they had weekly discussions (95 %) (Fig. 3).

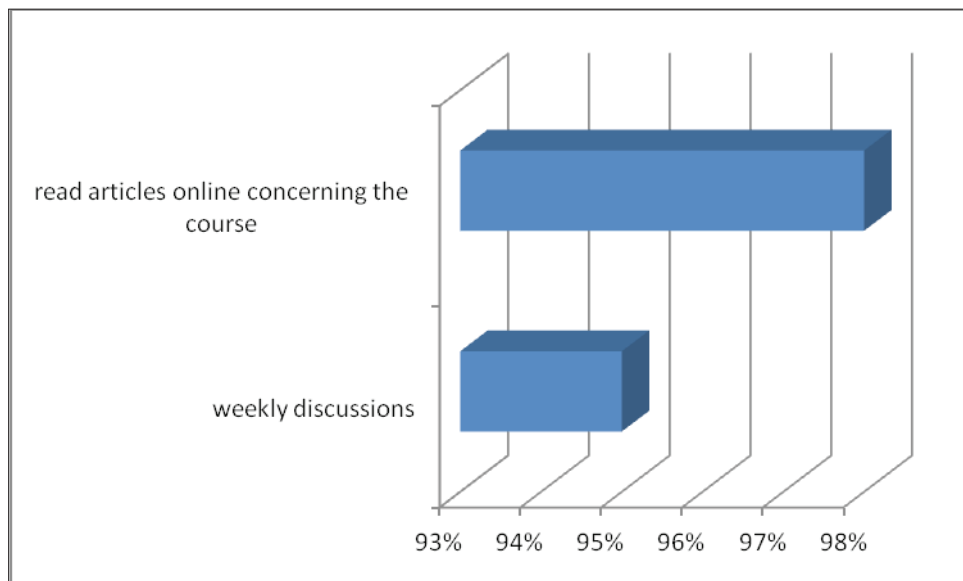


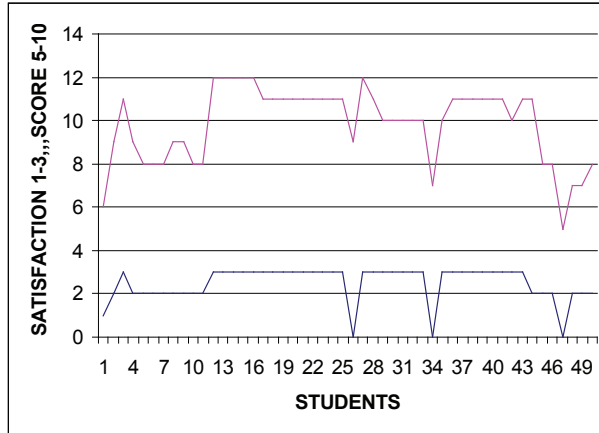
Figure 3

According to the records of the teacher, all groups finished their tasks given by the teacher on time (99 %).

In the interviews of the groups it was found that good performance of the groups was based on the same language of communication, within group members, and on the decrease of anxiety during their cooperation for the course requirements. It is worth mentioning here that emails and time of cooperation in between members of the groups were increased after the first month (almost doubled). Surprisingly enough, e-mails and time of cooperation in between teacher and students amazingly decreased after the first month (up to $\frac{1}{4}$). The face to face communication between teacher and students eliminated after the second month of the course. So, from 10 hours per week communication it was eliminated to 5 hours per week or less for all groups. This way, the teacher had more time to organize better the course material, in order to provide to students, more information concerning learning recourses and topics raised from the course material.

SELF REGULATED LEARNING STRATEGIES IN GROUPS OF LEARNERS

Evaluation process of groups was done in two stages: at stage one every group and the teacher had to evaluate all groups' performance, and at stage two only the teacher evaluated every student's performance on a written exam (test).



At stage one, the group performances according to the evaluation of all groups was generally good (72 % above average, 24 % average 4 % pass) (Fig. 4) and according to teacher's evaluation was sufficiently well (67 % above average, 22 % average 11 % pass) (Fig. 5).

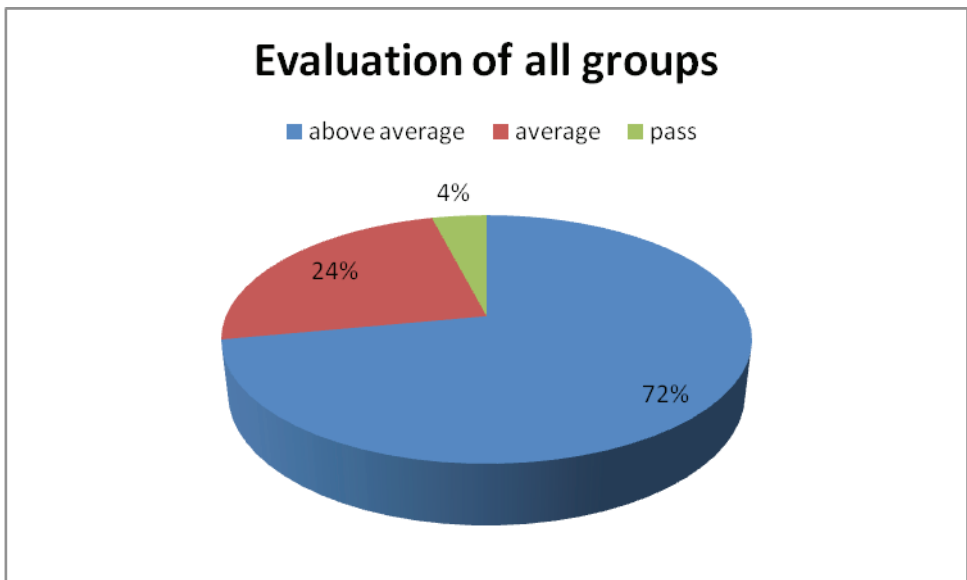


Figure 4

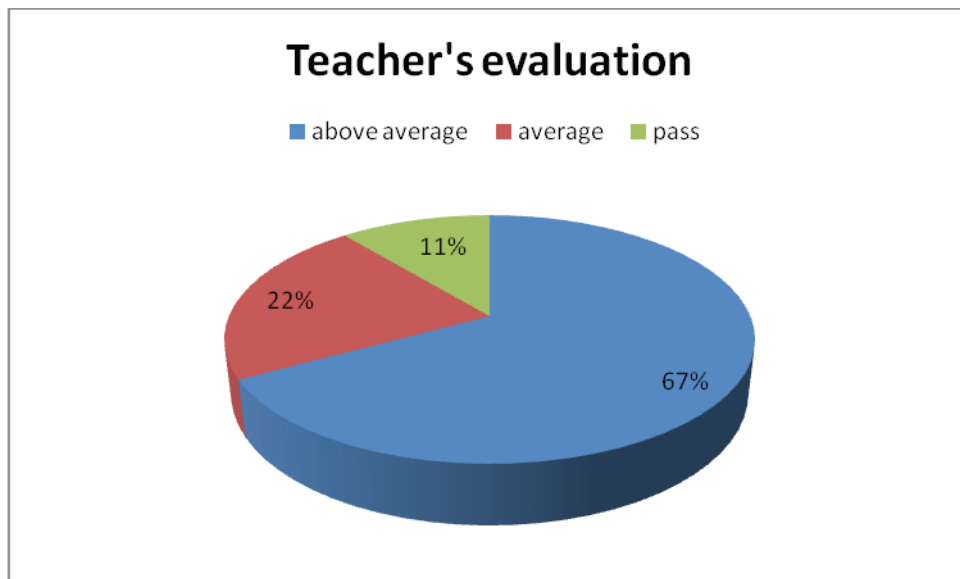


Figure 5

There was not any significant difference in the evaluations of the teacher and the students as groups, according to z test of percentages. Especially the score on above average was $z = 0.23$ $p < .05$, on average was $z = 0.1$, $p < .05$, and on pass $z = 0.5$ $p < .05$.

Evaluation at stage one showed also that the mean grade for the workload of each group when all other groups evaluated each one had a very small amount of variation (variances for all groups ranged from 0.3– 0.6) and the overall mean of means the scores for the 10 groups of students was 7.67 ± 1.35 . According to the grades achieved from all students at the final test at the end of the semester it was found that the mean score was 7.61 ± 1.43 . According to the test results of the students 89 % of them passed the final exam and they had grades above average.

Examining the learning process it was found that students according to *nearest neighbours learning* method formed concrete groups and changed participation in groups (motivation in between groups) 14 %. All students in the groups applied self regulation learning methods on the group as a whole unit. So, the group was concrete and played the role of the student so the participating students regulated their learning according to the rules set from the group itself. Members of the group who were not able to follow the tasks of the group were automatically excluded.

Questions asked to students like an interview and assessed in a qualitative way. In the question 'what is the best way to learn', students replied that they prefer learning in groups. In the question posed to students about conceptions and

misconceptions of self regulated learning students replied that it is ‘cooperative learning’ five students, ‘activating prior learning’ thirty students, ‘knowledge construction by doing meaningful tasks’ thirty five students, ‘self-direction of learning’ forty students, ‘knowledge transfer using group tasks’ ten students. All these replies show that students can benefit from learning environments that allow them to work in groups, set their own tasks and take over their responsibility of learning.

Conclusions

In this study we investigated a model of self-regulated learning based on groups learning. As a result it was found that self regulated learning in groups may promote self regulation learning in individuals. Students in this study had a close relationship with all members of the group, they shared same ideas and they had good marks on their final test. This learning model can help groups of students to improve their own metacognition, their self-efficacy and promote their learning motivation. It is noteworthy to mention here that self-regulated learners when they do teamwork, they optimise their learning strategies through continuous assessment (within and between groups assessment) and they develop their own self-regulated ability. Overall it was clear that self regulated learning process when applied to groups of learners who can cooperate and have the same objectives, goals and plans may promote self regulated learning.

The presented study has limitations concerning the small size of the group, the subject taught, the repetition of the experiment and the sex of the participants (mostly females). Of course, this study lack of generalizability but it proposes methods of developing students’ self regulated learning in groups according to the main objective of this study.

In conclusion, this study, demonstrated that self regulated learning in groups of students effectively regulated the learning process of all participants in the groups of this study, so teachers can apply this method to various teaching subjects. Self regulation learning in groups, in this study according to Zimmerman, et al (2002) developed self monitoring benchmark/regulations, structured self-monitoring, learning motivation, goal setting, action control, and learning strategies to all students.

Received 2013 11 06
Approved for publishing

References

- Bartolome, A, Steffens, K. (2011). Technologies for self-regulated learning. In: R. Carneiro, P. Lefrere, K. Steffens, J. Underwood (eds.). *Self-regulated learning in technology Enhanced Learning Environments*.

- Beishuizen, J., Steffens, K. (2011). A conceptual framework for research on self regulated learning. In: R. Carneiro, P. Lefrere, K. Steffens, J. Underwood (eds.). *Self-regulated learning in technology Enhanced Learning Environments*.
- Boekaerts, M. (1999). Motivated learning: The study of student x situation transactional units. *European Journal of Psychology of Education*, vol. 14(4): 41–55.
- Campbell, S. D., Inamdar, M., Rodrigues, V., Raghavan, V., Palazzolo, M., Chovnick A. (1992). The scalloped gene encodes a novel, evolutionarily conserved transcription factor required for sensory organ differentiation in *Drosophila*. *Genes & Dev.*, vol. 6: 367–379.
- Carneiro, R., Lefrere P., Steffens, K., Underwood, J. (eds.) (2011). *Self-regulated learning in technology Enhanced Learning Environments*.
- Chen, D. (1995). Guiding principles for instruction and program development. In: D. Chen, J. Dote-Kwan (eds.). *Starting points. Instructional practices for young children whose multiple disabilities include visual impairment*. Los Angeles: Blind Childrens Center, p. 15–28.
- Cheng, E. C. K. (2011). The Role of Self-regulated Learning in Enhancing Learning Performance. *The International Journal of Research and Review*, vol. 6, issue 1. Available at: http://libir1.ied.edu.hk/pubdata/ir/link/pub/A1_V6.1_TIJRR.pdf
- Dogoriti, E., Pange J. (2012). Teaching ESP with ICT in higher education. Foreign language teachers' perceptions and expectations of computer technology use in Foreign Language learning and teaching. *International Conference on Information and Communication Technologies in Education*. Rhodes, Greece, 5–7 July, 2012.
- ECC, European Commission. (2001). *Making a European Area of Lifelong Learning a Reality*. COM Brussels, Commission of European Communities, p. 9.
- Ewijk van Dignath C., Werf G. (2012). What teachers think about self regulated learning: Investigating Teacher beliefs and teacher Behavior on Enhancing students' self-regulation. *Education Research International*, article id 741713.
- Gamson, Z. F. (1994). Collaborative learning comes of age. In: S. Kadel, J. A. Keehner (eds.). *Collaborative learning: A sourcebook for higher education*, vol. 2: 5–17. University Park: The Pennsylvania State University: National Center for Postsecondary Teaching, Learning, and Assessment.
- Means, B. (1994). Using technology to advance education reform. In: B. Means (ed.). *Technology and education reform: The reality behind the promise*. San Francisco, CA: Jossey-Bass, p. 1–21.
- Mumtaz, S. (2000). Factors affecting teachers' use of information and communications technology: A review of the literature. *Journal of Information Technology for Teacher Education*, vol. 9(3): 319–342.
- Nussbaumer, A., Kravcik, M., Klammer, R. (2012). *Personalized support for self regulated learning*. JTEL Summerschool.
- Pange, J. (2007). Is e-Learning offering a new learning model? The case study of a Greek University. *Open education*, vol. 3, no. 2.
- Pange, J. (2008). *Educational Technology*. University of Ioannina Theodoridi Editions (In Greek).
- Pange, J., Lekka, A., Toki, E. I. (2010). Different Learning Theories applied to diverse learning subjects. A pilot study. *Procedia – Social and Behavioral Sciences*, vol. 9: 800–804.
- Papantoniou, G., Moraitou, D., Katsadima, E., Dinou, M. (2010). Action control and dispositional hope: An examination of their effect on self-regulated learning. *Journal of Research in Educational Psychology*, vol. 8(1): 5-32.2010 (no 20). ISSN: 1696-2095.
- Paris, S., Paris, A. (2001). Classroom Applications of Research on Self-Regulated Learning. *Educational Psychologist*, vol. 36 (2): 89–101.
- Pintrich, P. R. (1999). The role of motivation in promoting and sustaining self-regulated learning. *International Journal of Educational Research*, vol. 31: 459–470.
- Pintrich, P. R. (2000). The role of goal orientation in self-regulated learning. In: M. Boekaerts, P. R. Pintrich, M. Zeidner (eds.). *Handbook of Self-regulation*. San Diego: Academic Press.
- Shayer, M., Adey, P. S. (1981). *Towards a Science of Science Teaching*. London: Heinemann Educational Books.
- Toki, E. I., Pange, J. (2006). A Comparative Study of Two Learning Methods: Collaborative Learning Versus Nearest Neighbour Learning. *EISTA 2006 Proceedings*, 20–23 July 2006. Orlando, Florida, USA.
- Toki, E. I., Pange, J. (2007). Nearest Neighbour Learning: A learning model and an e-learning experience. *3rd Conference of HSSS Proceedings*, 26–28 May 2007, Peiraias, Greece.
- Underwood J., Baquely T., Banyard P., Coynne E., Farrington-Flint, L. Selwood, I. S. (2008). *Personalizing learning with technology*. Coventry Becta.

SELF REGULATED LEARNING STRATEGIES IN GROUPS OF LEARNERS

- Zimmerman, B. J., Paulsen, A. S. (1995). Self monitoring during college studying: An invaluable tool for academic self-regulation. In: Pintrich (ed.), *New directions in college teaching and learning*, vol. 63: 13–27. San Francisco: Jossey Bass.
- Zimmerman, B. J., Pons, M. M. (1986). Development of a structured interview for assessing student use of self-regulated learning strategies. *American Educational Research Journal*, vol. 23 (4): 614–628.
- Zimmerman, B. J., Bonner S., Kovach, R. (1996). *Developing Self-regulated Learners: Beyond Achievement to Self-efficacy*. USA: American Psychology Association.
- Zimmerman, B., Bonner, S., Kovach, R. (2002). *Developing self-regulated learners: Beyond achievement to self-efficacy*. Washington, DC: American Psychological Association.
- Zimmerman, B. J. (1998). Developing self-fulfilling 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: Guilford, p. 1–19.

