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REVIEWING EXISTING COLLABORATIVE SCRIPTS: A SELF-REGULATED LEARNING PERSPECTIVE

Self-regulated learning is a concept not well developed, yet. Simultaneously, this is the eventual target of every attempt to integrate technologies into the whole grades of education since a learner being able to manage the diffusion of enormous volume of information in information society knowing seems to be of top priority. The purpose of this study is to classify some of the mostly known learning scenarios according to their capacity to contribute to deliberately developed self-regulation. In order to augment this thought we preceded to a comparative study according to the main features of CSCL (Computer Supported Collaborative Learning) scenarios. The results of our study show that despite the fact that the existing scenarios respond to one or another component of the self-regulated learning cycle, they are still far from attaining the goal of transforming learners into independent beings, able to overcome the existing barriers for the attainment of the knowledge.

Keywords: *self-regulatory skill, educational scenarios, computer-supported collaborative learning, advanced learning technologies*

Introduction

21st century has imposed the necessity of overcoming the traditional view of education and using advanced learning technologies and especially applications of information and communication technologies and media (ICT&M) in education field (Ford, et al., 1996) to teach students the new skills and knowledge they need in order to respond to new challenges and become lifelong learners. The 1998 UNESCO World Education Report describes the radical implications the new information and communication technologies have for conventional teaching and learning. According to the same Report, the opportunity exists to harness this force and use it positively, consciously,

and with design in order to contribute to meeting defined learning needs. In order to cover this demand, what is needed is the knowledge of what an effective learner is and how they are equipped with to become lifelong learners.

Becoming an effective learner means that once you take the responsibility for your own learning you view your teachers more as resources and less as threatening figures. Teachers may transform the school classroom into a learning academy in which students struggle for attaining their own goals and individualize the instructed strategies in order to personalize the goals of the Curriculum. According to Zimmerman et al. (2003) "students who attend such a learning academy will gain more valuable than merely an appreciation of the importance of content matter; they will take with them a broad repertoire of study strategies, the self-regulatory capacity to apply and refine the strategies on their own, and the sense of self-efficacy to accept academic work as a personal challenge" (pg 137). The question which arises here is "how can we provide those learners with the skills to function effectively in a dynamic, information-rich and continuously changing environment?"

New learning environments need to be created in order for the students to be engaged learners, able to take greater responsibility for their own learning and constructing their own knowledge. In this new learning environment the student interacts with the teacher, the other students-peers, information resources and technology, engages in authentic tasks and is assessed through authentic performance. The environment provides the learner with chances of collaboration and opportunities to reflect on his own learning. In other words the supported environment is formulated in such a way that secures the self-regulated learning.

Features of self-regulated learning while teaching

Self-regulation lies at the core of successful and lifelong learning. Self-regulated learners tend to be active, reflective and productive in their own thinking and learning (Zimmerman & Kitsantas, 1996). Despite the fact that the self-regulation learning components seem to be clarified (such as goal setting, strategic planning, self-efficacy, outcome expectations, intrinsic interest/value, goal-orientation, self-instruction, imagery, attention focusing, task strategies, self-evaluation, causal attribution, self-satisfaction/affect and finally adaptive/defensive inferences) it has not been proven yet how the self-regulatory learning competence is grown deliberately for instance in a scholarly context.

Randi and Corno (2000) set the **five** features of teaching that afford opportunities for self-regulated learning while they found that they are the most useful components as having being identified previously by other instructional strategy or self-regulated learning theory and research.:

- The first feature is related to encouraging students to meet challenges (e.g. students choose the kind of assignment to be engaged or students match their skills with the opportunities they have and then choose one).
- The second feature concerns the way that the community is built (it is focused on collaboration and the manners of its implication e.g. explicit/implicit instructions for learning skills-roles, reaching consensus, respect for others ideas and work etc.).
- The third feature is referred to scaffolded strategy instruction (the learner starts as an observer of the teacher's model and ends up as an independent learner who applies the instructed strategy in his own way making an adaptive use).
- The fourth feature is related to diagnostic performance evaluation (such as peer evaluation or self-evaluation according to some known criteria; emphasis is spread on qualitative feedback).
- The last feature is referred to the Curriculum-embedded assessments (in order the teacher to assess what students can do and stretch them to their full potential through ongoing teacher assessment).

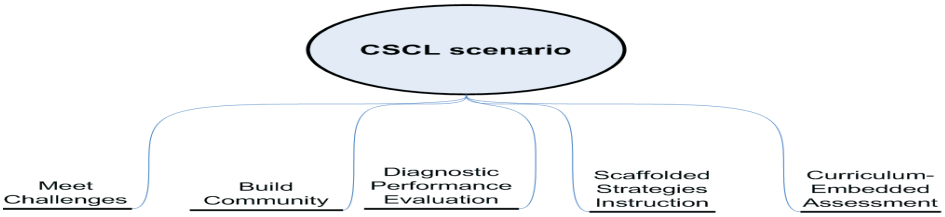

Figure 1. The features of teaching according to Randi & Corno (2000) in an attempt to provide self-regulated learning for students

As implied above, the development of the self-regulating skill demands a collaborative environment (virtual or not) in which learners interact with others and multiply their own models representations. Thus, their repertoire is broadened and they see the learning event from a differentiated perspective. Yet, they adapt their observed models' strategies to their affordances and

capacities in order to attain their goals. Besides, the constructivist perspective implies exactly this: learning is a double process happening firstly on the social level and later on the individual level. All the higher functions originate as actual relationships between individuals (Vygotsky, 1978).

Computer-supported collaborative learning scenarios

Proponents of collaborative learning hold that this method of learning can help students achieve higher-order and longer information retention than those who work independently. The collaborative learning offers students the chance to engage in discussion and debate, take responsibility for their own learning and hence obtain a critical thinking ability. According to Johnson and Johnson (1993) the volume of accumulated researches on collaborative learning strategies has made this pedagogical method not only the most popular teaching practice but also acquire a validity and generalisability rarely found in the education literature.

Koschmann (1996) defined computer-supported collaborative learning as an emerging paradigm for research in advanced learning technology that focuses on the use of information and communications technology and media as a mediational tool within collaborative methods of learning. Research until now has offered a series of computer-supported collaborative learning scenarios which are planned to be used in school classrooms utilizing and maximizing the benefits through using ICT&Ms tools. Essentially, they are cooperation scripts –usually formed for traditional classrooms- which have simply been transferred to computer settings (Rummer et al., 2003; Weinberger et al., 2004). However they are not so much effective as they seem to be inadequate in computer environments (Dillon and Gabbard, 1998). But what is a collaborative scenario? A collaborative scenario (or script) is a set of instructions regarding to how the group members should interact, how they should collaborate and how they should solve the problem (O'Donnell & Dansereau, 1992). They are designed to function effectively in advanced learning technology oriented environments. These educational scenarios are divided into two categories: the Computer Supported Collaborative Learning (CSCL) scenarios and the Computer Supported Collaborative Work (CSCW). CSCL and CSCW are both based on the premise that computer supported systems can support and facilitate group process and group dynamics in ways that are not achievable by face-to-face, but they are not designed to replace face-to-face communication. Their differences are fundamental for the sustained philosophy

and the support they provide for different domains: CSCW tends to focus on communication tactics while CSCL gives emphasis on the content of communication; yet the purpose of CSCW is to facilitate group communication while the purpose of CSCL is to support or scaffold students in learning together effectively and maximize the gained benefits. As it can be derived from the theoretical and practical approaches, CSCL is appropriate for the educational settings and the CSCW mainly for business settings. Consequently, the focus of our review is on CSCL scenarios as they are used in educational settings. Moreover, a CSCL scenario without an upper goal provides trivial importance to the educational practices. This means that applying a CSCL scenario in educational settings needs a theoretical basis on which it is based on and a present perspective for the future learner or employee.

This review arose from a main question pertinent to designing, developing and teaching self-regulatory skill through computer supported courses: In what way should the CSCL scenarios be developed in order to facilitate the proximal self-regulated learners? How much closed are the existed CSCL scenarios from developing a learner like this? What can we learn from this review for future CSCL scenarios building? This is asked from the point of view of researchers who have studied the computer supported collaborative scenarios and offered new perspectives in educational view. Yet, it is a question needed to be answered from designing point in order to fit theoretical perspectives with educational needs. Ultimately, it is asked from the teachers who despite the fact that they are informed about the necessity of transforming their students from passive to active and responsible learners, they do not know practically how to proceed.

Method of the Review

The relevant literature for this review is found in many disciplines: in journals, in www, in communications, all grades of education, educational technology, as well as in the subject disciplines. Many articles advocate in favor of advanced learning technology in all grades of education via educational scenarios.

The primary sources of literature were followed by ERIC (a search engine) searches using keywords from the articles identified in the journals articles and in previous literature reviews. Yet, the theoretical foundations and researches on self-regulated learning were included in the studied literature. This review also includes research from the developing CSCL research com-

munity despite the fact that this kind of research has only recently turned to online learning.

This is not a complete review of all CSCL scenarios which are designed or applied in real classrooms and research centers around the world. This seems impossible taking into account that hundreds or thousands of teachers, researchers and theoreticians test a new learning scenario in every didactic hour. What was examined in this review is how much closed or not from establishing the self-regulated learning the best known practices of learning scenarios are. CSCL scenarios reviewed here will be discussed in five main fields according to Randi's and Corno's research (2000) on the main components of teaching for self-regulated Learning. The selection of the following CSCL scenarios has been done according to the CSCL-related research references. All of them are proposed for co-operation in educational settings. Since the co-operative criterion is considered to be the main facilitator between the expert's model display and the adaptive use of learned skill, it is understood why we chose co-operative scripts (Zimmerman, 2003).

Description of four distinguished CSCL scenarios

The "CaMILE" (Collaborative and Multimedia Interactive Learning Environment) scenario, developed by Guzdial and Turns (2000) is a scenario for supporting learners working in a discussion forum. Firstly, learners have to define the type of message they want to send by selecting among five alternatives:

- new idea,
- rebuttal,
- revision,
- comment and
- question

Also, they can paste new prompts into their note as a support of their alternative. If the participation is low then a new discussion is started but the teacher who attends on the discussion may provide learners with an "anchor" which links them with a web-page from where learners may start their discussion. The web-page may be created by the teacher and includes a topic for discussion. This capability is referred to as "anchored collaboration". This scenario is designed rather for the knowledge acquisition than for problem solving. The first feature of encouraging learners to meet challenges is fulfilled

through their free choice of the type of message they want to send for discussion. Concerning the second feature, namely how the community is built, it is not clear from the description of the scenario. Learners insert into the forum but as a whole mass and not in groups. The distribution of roles occurs through the learner's choice of the type of message as it is characterized by the learner (e.g. if he selects the "comment" button automatically he is defined as the commentator by the system). The scaffolded learning may be implied but not stated clear. Challenging learners to discuss a topic, they're engaged in playing multiple roles and thus are indirectly led to the learning. Nevertheless, there is no exhibited model to imitate its function. The fourth feature of diagnostic performance evaluation may be implied in a second level of analysis. Starting a new discussion after an observed and recorded low participation is a sign of some kind of evaluation. This evaluation is mostly referred to as quantitative and not qualitative data. The anchor may be a component of qualitative feedback of the evolving discussion since it provides learners with information necessary to be included in the topic. But the main point is to enrich the dialogue and not contribute to individual knowledge acquisition taking into account the particular features of everyone's learning capability. The fifth feature of Curriculum-embedded assessment is not referred to as a main element of this scenario and not implied.

The Universante is a CSCL scenario which was used to teach health to the Universities' community in four countries (Berger et al., 2001). The students were divided into five thematic groups of 16 participators (four from each country):

- AIDS,
- cancer,
- infectious diseases,
- cardiovascular diseases and
- trauma related to accidents.

Firstly, the group was divided in two sub-groups in which a different clinical case of the same theme was distributed. Each sub-group discussed about a topic related to the public health in a different forum space. The role of the tutor was to observe and stimulate the sub-group to discuss other related aspects of the topic. A face-to-face debriefing meeting with all participants of the same topic from the same country took place in order to synthesize the different findings they found for their country facts. Then they entered this list in a database through an online form. All fact lists were then discussed trying to recognize the common elements and the differences among countries facts.

The teacher drew the attention on the methodological aspects of the collected data and lastly the students of each group proposed a solution to the problem they coped with. This scenario presents an important difference in comparison with other scenarios since it includes face-to-face activities. The first feature of encouraging students to meet challenges through the free choice of the assignment they would commit to not responded to due to the fact that the theme was given to the participators with no negotiating possibility. Concerning the building of the community there is strong evidence that the community is built on an assignment basis which is focused on collaborative activities. Albeit there are no strict instructions about the different roles of the contributors in the sub-group, there is a conspicuous difference between the roles of each sub-group. The result of each sub-group work is strongly related and influenced by other's work. Reaching consensus is a main feature in that work in order to perform shared work results. The third feature of scaffolded-learning is not corresponded except from the methodological hints coming from the observer-teacher who attends the development of the work. The last two features of diagnostic performance evaluation and Curriculum-embedded assignments are not captured in this scenario. It seems that the upper goal of this scenario is to have the students engaged in collaborative activities from all over the world participators and not the evaluation of their project results.

The "learning protocol" scenario by Pfister and Muhlpfordt (2002) is a chat-based scenario (it is designed for a synchronous learning environment) in which three to five learners and one tutor participate in higher-order activities. The purpose of this scenario is to improve learning outcomes by imposing structure on the learning discourse and this is done by a referencing function, a typing function and a predefined sequence of contributions. The learner's task is to discuss topics from geology and philosophy. The learner firstly chooses the type of message he wants to refer to and then he characterizes the type of message –question, comment, explanation-he sends to the shared chat window. Each learner's participation is defined by the system and thus if one learner wants to contribute he can not if it is not his turn. Only the tutor may participate answering to one's question while chat windows are blocked. The first feature of encouraging students to meet challenges is fulfilled through the freedom that the learner has to select the type of message he wants to refer to. However, it is not explicit how a learning community is built. It is rather externally imposed by the system and it is not changed. The learner functions independently and the tutor's model is obvious only when a question arises. However, the learner is exposed to the peers' models and is asked to make a

comment to their given explanations. The system does not provide any further support for the individualization of the committed knowledge. According to the fourth criterion of the diagnostic performance evaluation there is no such evidence. Peer's evaluation seems to happen more internally –through the comments on other's contribution- than externally. There is a further ambiguity concerning the measurement of learning effects by means of a standard knowledge test.

The Arguegraph scenario (Jermann and Dillenbourg, 2003) was implemented as a part of TECFA (Technologies de Formation et Apprentissage) Virtual Campus, a learning and communication platform used by students on a daily basis. It focuses on the knowledge or conceptual change as a result from the argumentation attempts. The scenario starts with a multiple-choice questionnaire to be answered from which students are classified by a category of opponent values, principles, and beliefs etc in a graph. According to this graph students are paired so that the average distance between them to be maximized. After that they sit together in front of the computer and answer the same questionnaire again having to agree on a single answer and accompanying their final choice with an argument to support it. Both of them have access to other's previous answers. All arguments are collected by the system and displayed in a web-page. This is used by the teacher in order to make a synopsis. Lastly, the students are asked to answer a question taking into account the total arguments that were made by the classmates. In this scenario the first feature of encouraging students to meet challenges through their choice of the kind of assignments they will be engaged in, is not described. In contrast, it is imposed by a predetermined questionnaire including specific items. This is observed during the first phases of the scenario but radically changes in the last phase: a particular question must be designated to be answered taking into account the rest of the community members' arguments. However, it does not capture the spirit of the responsibility on students' own learning. The second feature concerning the way the community is built is perfectly described here since the students have to collaborate in pairs in order to reach a consensus and this includes an essential respect for other's ideas. The scaffolded strategy instruction feature is described in a way that a student starts their effort individually, continuously having to take into account others' arguments and lastly makes an adaptive use of the recorded arguments. No matter how the conceptual change comes (either through the peer's or the teacher's model) what matters is the student's exposition to an instructed concept. The fourth feature of diagnostic performance evaluation is indirectly described while a student

has access to their peer's previous answers in order to evaluate their outlook on a topic. The last feature of curriculum-embedded assessment is not clearly described since the role of the teacher is supporting for the formulation of the groups and facilitating the précis.

Conclusions

Looking at the presented CSCL scenarios and the results of our comparative study we come to the following conclusions: What can be regarded as the most noticeable commonality of the studied scenarios is that they facilitate the building of the community and the students' taking responsibility of their own learning. Given the importance of building a community in a computer-supported learning environment one may realize the predominance of this matter. According to Harasim (2000): "The principle of collaborative learning may be the single most important concept for online networked learning, since this principle addresses the strong socio-affective and cognitive power of learning on the Web Collaboration provides the social glue of a community that engages learners and motivates them to participate" (pg. 53). The evaluation and the assessment aspects of learning have not been particularly emphasized. Keeping in mind the difficulties arising from the development of such a environment which supports the formative evaluation (neither a holistic approach was recorded) of a process of learning one does reason the absence of this section. The most impressive of all is that no assessment is estimated in the description of the scenarios. Despite the fact that every separated scenario is based on a Curriculum course, there was no scenario found that might include some kind of assessment. At least, it is not referred to the description of a scenario. It may stem from the definition of the term as it describes how learners should collaborate in order to attain a goal. However, it is considered as a necessary part of the process of collaboration since the attribution of collaboration must be estimated and stimulate future collaborations. Consequently, one of the most important phases of the self-regulated learning (the evaluation and the assessment of the whole process) is not covered at all even if this attributes causal significance to the results. It seems that the starting-point is so much absorbent that it leaves no space for development for other parts of learning. Supporting a reflective process is so much vital as the same concept of effective learning. A few attempts without a feedback or without being aware of your progress give rise to meaningless learning. Concerning the strategy instruction, which is placed in the middle of the process, only the Arguegraph scenar-

io does contribute to an adaptive use of the instructed knowledge through the capability a learner has to implement the implicit knowledge they obtained. Thus diagnosis is one of the key issues in CSCL scenarios. A peer would be interested in being informed about their or others' progress through an assignment. As a result, much more emphasis should be given to this point.

Table 1. The comparative synopsis of the studied CSCL scenarios

	Meeting Challenges	Building Community	Scaffolded-Strategy Instruction	Diagnostic Performance Evaluation	Curriculum-Embedded Assessment
CaMILE	√				
Universante		√			
Learning Protocol	√				
Arguegraph		√	√	√	

Discussion

The upper goal of this study was to review some of the most known scenarios in computer-supported collaborative learning with reference to developing self-regulating skills. The growing development of the advanced learning technologies over the last two decades cajoles into developing a new kind of learner –future citizen- able to overcome the huge amount of the conceded information and consciously focus on a target. Moreover, the rapid change of the financial state in most countries –due to the later phenomenon of globalization- demands new skills for citizens that are characterized by flexibility, adaptation and mobility. This kind of citizen must be grown through analogous educational settings from the first years of their scholarship. Equipping learners with self-regulated strategies will provide them with necessary techniques for becoming independent thinkers and lifelong learners.

The development of such a new learner seems to pass through the integration of communication and information technologies and media into the educational system in a schema of educational scenarios. These scenarios should be based on some principles related to encouraging learners to meet the challenges, building a community with common/shared goals, scaffolded strategy instruction, diagnostic performance evaluation and curriculum-embedded assessment. In order to illustrate how the CSCL should be structured

–from a self-regulating perspective- we studied a few dominant CSCL scenarios and it was ascertained that there is a long way till we reached the goal of developing a self-regulated learner. Main topics such as evaluation and assessment seem to be excluded from the CSCL scenarios while others such as building community and scaffolded strategy instruction are vague. Having on our mind the main principles that a CSCL scenario should fulfill in order to contribute to self-regulated learning outcomes, we –as researchers, teachers or designers- will be able to write/design more effective and powerful learning scenarios to facilitate the group and individual learning. Given the fact that the relevant literature reveals a decided lack of an explicit theoretical foundation and that research about distance education is in its infancy, there is much research to be done to better understand the capacity of distance teaching and learning (of which the main core is CSCL scenarios). There are numerous issues and areas of current research with important outstanding questions.

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RAZMATRANJE POSTOJEĆIH SCENARIJA SARADNJE: PERSPEKTIVA SAMOUSMERENOG UČENJA

Samousmereno učenje još je nedovoljno razvijen koncept. Istovremeno, to je krajnji cilj svakog pokušaja integrisanja novih tehnologija u sve stepene obrazovanja, jer da bi onaj koji uči mogao da izađe na kraj sa rasprostranjenošću ogromne količine informacija u informatičkom društvu, čini se da je najvažnije znanje. Svrha ove studije je klasifikovanje nekih od najpoznatijih scenarija učenja po tome koliko mogu da doprinesu postepeno razvijenom samousmeravanju. Da bismo razradili ovu misao, pristupili smo komparativnoj studiji u skladu sa osnovnim karakteristikama scenarija učenja kroz saradnju pomoću računara (CSCL). Rezultati naše studije pokazuju kako uprkos činjenici da postojeći scenariji reaguju na neku od komponenti ciklusa samousmerenog učenja, još uvek su daleko od postizanja cilja, a to je pretvaranje onih koji uče u nezavisna bića koja mogu da prevaziđu postojeće barijere u sticanju znanja.

Ključne reči: *sposobnost samousmeravanja, scenariji nastave, učenje kroz saradnju pomoću računara, napredne obrazovne tehnologije*