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## ASSESSING SELF REGULATED LEARNING: QUALITATIVE VS QUANTITATIVE RESEARCH METHODS

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**Abstract:** *Recent investigations revealed many facets of self regulated learning, highlighting the necessity to study this phenomenon in real contexts and real time, in events rather than as aptitudes. These two perspectives propose two types of methods which can be used to assess self regulation. The most common methods for measuring self regulated learning as an aptitude are quantitative methods such as questionnaires, although structured interviews and teacher ratings are also used. Qualitative measures assess mostly self regulated learning as an event, the data being collected during learning. The methods analyzed in this study are think aloud protocols, learning journals, and observations of performance. The advantages and the disadvantages of both quantitative and qualitative measures are discussed. Assessing self-regulated learning is a fundamental element of research in this field, new methods are developed allowing self-regulated learning to be assessed as a dynamic, continuous process which unfolds over time and in a specific context.*

**Keywords:** *quantitative methods, qualitative methods, learning journals, self regulation, think aloud protocols*

### 1. INTRODUCTION – ACADEMIC SELF REGULATED LEARNING

Self-regulated learning is a proactive process that students use to acquire academic skills, such as setting goals, selecting and deploying strategies, and self-monitoring one's effectiveness [24]. Recent investigations in this field revealed many facets of self regulated learning, highlighting the necessity to study this phenomenon in real contexts and real time, in events rather than as aptitudes [21].

An aptitude is a relatively enduring trait of an individual, and measurement of this trait can be used to predict future behavior. Thus, an individual's self-perception of his or her metacognitive and/or cognitive processes is an accurate measurement of self regulated learning. Self regulated learning as an aptitude

can be assessed through responses to questionnaires. Often self regulated learning as an aptitude is measured through quantitative methods such as self-report questionnaires [21].

Self-regulated learning as an event is viewed within particular contexts [5,14]. Self-regulatory processes should be examined in real time because learning is an ongoing process that unfolds within particular contexts. As an event, self regulated learning can be assessed mostly through qualitative methods such as think aloud protocols, error detection tasks, observations of performance, structured interviews, and learning journals.

As an aptitude, most of the assessment of learning is focused as an outcome, while as an event, learning is focused on the process. Traditionally, most of the assessment of self

regulated learning was focused on ability as a construct and not on certain cognitive and strategic processes of students thinking [11].

Despite the limitations of each of the two perspectives, researches reveal the complexity of learning, having implications for how we study phenomena such as self regulated learning and prompting reconsideration of traditional distinctions between aptitudes for self regulated learning in and across events [21].

## 2. ASSESSING SELF REGULATED LEARNING THROUGH QUANTITATIVE METHODS

The most common methods for measuring self regulated learning as an aptitude are quantitative methods such as questionnaires, although structured interviews and teacher ratings are also used.

**2.1 Self report questionnaires.** Self report questionnaires are widely used because they are relatively easy to design, administer, and score. The fact that the items ask respondents to generalize their actions across situations, self-report questionnaires measure self regulated learning as an aptitude. Some of the most utilized questionnaires are: The Motivated Strategies for Learning Questionnaire [15], Inventory of Learning Styles [18], The Five-Component Scale of Self Regulation [12], The Learning and Study Strategies Inventory [20], Approaches to Learning and Studying Inventory [10]. Although, the most used questionnaires in the recent researches are those developed by Pintrich and by Vermunt [15,18].

*The Motivated Strategies for Learning Questionnaire* [15] was designed to measure students' motivation and self-regulated learning as they relate to a specific course, in the frame of socio-cognitive model of learning. The course is seen as the unit of measure, with the idea that the course is ideally situated between the very general level of "all learning activities" and the very specific and unworkable level of "every learning situation within the course" [9].

The Motivated Strategies for Learning Questionnaire comprises several scales and measures learners' motivational beliefs and use of self regulated learning strategies (cognitive, metacognitive, motivational and behavioral self regulation strategies) from a socio-cognitive perspective. MSLQ has two sections: a motivation section and a learning strategy section. The Motivational Section consists of three sections: value, expectancy, and test anxiety. The Learning Strategy Section contains three types of scales: cognitive, metacognitive and behavioral strategies. Other researchers added another scales, such as motivational self regulation [22].

Scores from the MSLQ have been used extensively by investigators doing empirical research in the areas of motivation and self-regulated learning. Through MSLQ, teachers are able to identify students who may be having trouble and provide additional study skills assistance [2].

*The Inventory of Learning Styles* [18] is developed in the frame of information processing model of learning. While MSLQ focuses on specific domains of learning, ILS measures self regulated learning in a general context.

ILS consists of 120 statements that cover 4 learning components: cognitive processing strategies, metacognitive regulation strategies, conceptions of learning, and learning orientations. The questionnaire consists of 20 scales: five processing strategies, five regulation strategies, five conceptions of learning, and five learning orientations. The five processing strategies are: deep processing comprising relating and structuring, and critical processing, stepwise processing comprising memorizing and rehearsing, and analyzing, and concrete processing. The regulation strategies are: self regulation comprising self regulation of learning process and results, self regulation of learning content, external regulation of learning process and external regulation of learning results and lack of regulation. The five conceptions of learning are the following: construction of knowledge, intake of knowledge, use of knowledge, stimulating education, and co-operative



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learning. Finally, the five learning orientations are the following: personally interested, certificate oriented, self-test oriented, vocation oriented, and ambivalent.

Both analyzed questionnaires can be used at the university level. Studies reported a high stability of results over time and good internal consistency coefficients for all scales. Also, the translated Romanian versions of the questionnaires confirmed the factorial structure of the original versions and good psychometric properties, comparable with those reported by the authors of the instruments [6,7].

**2.2 Advantages and disadvantages regarding the use of quantitative methods.** Questionnaires offer a stable perspective of the behavior in most situations, making possible the generalizations.

The scores obtained from questionnaires are stable and show moderate convergent validity with the scores obtained from other measures, and moderate predictive validity.

Despite the fact that the questionnaires are easy to use and the complexity of the information revealed, the quantitative methods have also many limitations. Some authors [14,17] argue that when completing a questionnaire, the subject must draw from memory, more a process of reconstruction than recovery, thus overall assessment of strategic processing through self-reports has limited validity and usefulness. There is also a high probability that the subjects confuse their desires or intentions with their real actions. Assessment using self-reports only allows us to ascertain a learner's predisposition to use self-regulated learning strategies [16].

Another limitation concerns the fact that students are not always aware of the strategies they use, so they may not report them even when they have made use of them. When assessing, it is assumed that the subject is

aware of his or her cognitive activity (thoughts, feelings, etc.) and that he or she can establish relationships between these and the final results. However, research shows that our cognitive system only has limited access to the processing and establishing of causal relationships for the behavior being assessed [8].

### **3. ASSESSING SELF REGULATED LEARNING THROUGH QUALITATIVE METHODS**

Qualitative measures assess mostly self-regulated learning as an event, the data being collected during learning. The methods analyzed in this study are think aloud protocols, learning journals, and observations of performance.

**3.1 The think aloud protocols.** The think aloud protocol offers a process methodology that measures cognitive and metacognitive SRL processes during learning, because the student reports about thoughts and cognitive processes while performing a task [3]. The think aloud protocol can be as unstructured ("Explain your work") as that or it can follow a formal, conditional script that dynamically adjusts which questions or comments an observer makes depending on how the student behaves or whether the student mentions particular information [5].

The think aloud methodology is used to examine how self-regulated learning fosters conceptual understanding of complex systems, or to examine how students plan, monitor, use strategies, and handle task difficulties while learning about a challenging science topic. Research using this method proved the capacity of the think-aloud protocol to capture self-regulation processes in a dynamic learning situation.

An advantage of the think-aloud methodology is that it is open-ended, and the students' responses are coded into self-regulatory process categories by trained observers at a later point in time. The disadvantages of the method regard the fact that verbalizing thoughts during learning can disrupt the learning process.

**3.2 Learning journals.** Learning journals are useful in research on self-regulated learning due to their application as an instrument for recording learning processes and for evaluating the results. Learning journals are a self-guided way of writing that allows for elaboration and reflection on learning content. In a learning protocol, learners apply cognitive and metacognitive strategies while writing down their reflections on previously presented learning contents. They are instructed to ask themselves what they do not understand and what can be done to bridge the gap in understanding [4].

Journal-writing has been associated with improved capacities for metacognition and self-regulation. Other authors imply that journals enable relationships between the self-regulation cycle and the learning goals of the students [19]. Although, research revealed that learning journals usage affected the metacognitive strategies of the students positively while it had no significant effect on cognitive strategies such as rehearsal, elaboration and organization [1].

Diary measures of self-regulated learning have been used both with elementary school children and with students, showing SRL trained students displayed significant increases in homework effectiveness, time-management skills, a broad array of self-reflection measures, and academic performance skills. Also, learning journals provide us with time-series data, which offer the possibility of conducting analyses with more sophisticated methods.

Although the results obtained through learning journals are promising, there are also some limitations, referring to the way self-regulation processes are assessed. It is possible that the students elicit more comprehension monitoring than they actually document in the learning protocol or their reflections may be

biased. Another issue is the fact that some students invariably write more and more openly than others. Learning journals is a method which requires effort from the learner, as well as the think aloud protocol method.

**3.3 Observations of performance.** Observations are used in research as measurements methods of self-regulated learning. The demarche for using observations for the assessment of self-regulated learning includes the necessity to decide which categories of self-regulation strategy use and processes will be observed. The observation can focus on individual students or on interactions between students. Often, they are complemented with interviews.

The advantages of observations are that this is an objective measure of what the learners are doing instead of what they remember or they think that they do. The observations reflect what learners do versus what they recall or believe they do. Observations also allow associations between learners' behaviors to task conditions, especially those where feedback is available within the boundaries of a task. Observations can ameliorate difficulties such as positive response bias or limited language for describing cognitive processes [5]. However, observations are limited to examination of behaviors and provide limited insight into how individuals make sense of events [21].

**3.4 Advantages and disadvantages regarding the use of qualitative methods.** An optimal time to use qualitative methods is when it is not possible to separate a phenomenon from its context [23]. This is the case for self-regulated learning. The qualitative methods allow the assessment of the process rather than the outcome of learning, and enable the researchers to challenge self-regulated learning theories using other methods than those traditionally used.

The disadvantages concern the fact that there are no standardized measures for assessing self-regulation.

Qualitative methods are particularly well-suited for examining self-regulated learning as events because they involve rich, holistic descriptions, emphasize the social settings in which the phenomena are embedded, do not



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make assumptions about intra-individual stability, and are oriented to revealing complexity. Qualitative measures also enable researchers to take a grounded, inductive approach to understanding students' thoughts and behaviors [13].

#### 4. CONCLUSIONS

Assessing self-regulated learning is a fundamental element of research in this field. A greater number of methods both quantitative and qualitative measuring instruments should be created and validated in the future, allowing self-regulated learning to be assessed as a dynamic, continuous process which unfolds over time and in a specific context [21].

New trends in the field of self regulated learning assessment concern collecting information during the space and time that a task is under way. From this perspective, recent research promotes learning in hypermedia contexts. The computer is viewed as a powerful tool for promoting, recording and interpreting actions indicative of self-regulated learning. New methods are proposed, such as graphic analysis, analysis using conceptual maps, analysis through neural networks [8].

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