# AutoReg: A web-based platform for scalable administration and analysis of self-regulation assessments in higher education

Víctor Osores[a,*], Aurora Marín[b], Carlos Paiva[a]

[a]*Departamento de Matemática, Física y Estadística, Universidad Católica del Maule, Av. San Miguel 3605, Talca, Chile*
[b]*Departamento de Biología y Química, Universidad Católica del Maule, Av. San Miguel 3605, Talca, Chile*

## Abstract

The assessment of self regulated learning is a key component in contemporary educational research and school based intervention programs. However, many digital tools focus mainly on questionnaire delivery and provide limited support for structured data management, repeated applications, or research grade analysis.

In this work we present AutoReg, a web based platform designed for the administration and analysis of psychometric instruments focused on learning self regulation. The system supports the creation of courses and test assignments, public participation links, participant identification, and the storage of multiple test attempts per student, enabling longitudinal tracking at both the individual and group level. AutoReg implements an integrated workflow that includes online questionnaire delivery, automatic scoring and storage of item level responses, and built in statistical analysis of test results. These analyses include descriptive statistics, reliability estimation using Cronbach's alpha, score distributions, and factor level summaries based on predefined subscales of the self regulation instrument.

The platform was validated through a real deployment in a secondary school in the city of Linares, Chile, where the self regulation learning test was administered to students from 8th grade to 12th grade. This deployment demonstrated the system's ability to manage authentic school data, support classroom level reporting, and generate datasets suitable for educational research. By integrating test administration, data management, and psychometric analysis within a single web based environment, AutoReg provides an accessible and rigorous tool for educators and researchers interested in monitoring and studying self regulation in real educational settings.

*Keywords:* Self regulation, Learning analytics, Educational assessment, Psychometric analysis, Web-Based platform

## 1. Introduction

The heterogeneity of students entering Chilean universities has been a well established reality for more than three decades. This process has promoted institutional, curricular, and academic transformations, leading universities to incorporate systematic practices of continuous improvement in order to ensure educational quality Covarrubias et al. (2019), [10].

At the same time, students pursue predefined academic goals throughout their university education and face multiple challenges in order to successfully complete their programs. To do so, students must possess the skills required to perform academic tasks and achieve their learning objectives. However, having such skills alone is not sufficient. Successful university students are typically described as *self regulated learners*, as they are able to generate and sustain thoughts, emotions, and actions that are systematically oriented toward the achievement of their academic goals Zimmerman (2013), [27]. According to Bjork et al. (2013), [6], students at all educational levels show deficits in this regard, even at advanced stages such as university. This difficulty is often more evident in first year students, who are transitioning from secondary to higher education.

Self regulation governs the emotional, cognitive, and behavioral processes that allow students to manage their learning activities in order to achieve academic success [5]. In this sense, self regulation plays a central role in how students plan, monitor, and evaluate their own learning processes.

### Self regulation of learning

One of the most influential researchers in the field of self regulation of learning is Barry Zimmerman. In

---
*Corresponding author
*Email addresses:* `vosores@ucm.cl` (Víctor Osores),
`amarin@ucm.cl` (Aurora Marín), `cpaiva@ucm.cl` (Carlos Paiva)

1989, Zimmerman proposed a model in which self regulation is defined as the degree to which students actively participate in their own learning at the metacognitive, motivational, and behavioral levels. According to Zimmerman, self regulation is not a mental ability nor a synonym for academic performance. Rather, it is a process of self directed learning through which students transform their mental abilities into academic skills.

Self regulated learning involves not only the use of cognitive strategies, but also a high level of self awareness and motivation. In other words, students develop the thoughts, emotions, and behaviors that are necessary to achieve the academic goals they set for themselves. The concept of self regulated learning therefore refers to a view of learning centered on cognitive, motivational, and behavioral components that enable individuals to adjust their actions and goals in order to obtain desired academic outcomes, while taking into account changes in their environment Zeidner et al. (2000), [25].

Self regulation thus constitutes a process that activates and sustains thoughts, behaviors, and emotions in the pursuit of personal goals Zimmerman (2013), [27]. Students who regulate their learning effectively are able to set goals, mobilize effort, and allocate personal resources in order to achieve them.

From this perspective, the study of self regulation of learning is of central importance for understanding academic performance, particularly in higher education systems that emphasize autonomous learning and competency based models. Chilean universities, including the Universidad Católica del Maule, have adopted educational frameworks that place strong emphasis on students' ability to manage their own learning processes. This shift highlights the need for tools and methodologies that allow the systematic measurement and analysis of self regulated learning in real educational contexts.

### 1.1. Motivation for a web based self regulated learning assessment platform

Despite the central role of self regulation of learning in academic success, its measurement in real educational settings remains limited by practical and methodological constraints. In many schools and universities, self regulated learning is assessed using paper based questionnaires, isolated digital forms, or external survey platforms that are not designed for systematic educational data collection. These approaches make it difficult to manage large groups of students, to track repeated applications over time, and to perform reliable psychometric analyses.

From a research perspective, self regulation of learning is not a static trait but a dynamic process that evolves as students interact with instructional environments, academic demands, and feedback. Capturing this evolution requires tools that allow repeated measurements at the individual and classroom level, together with consistent storage of responses and metadata. Without an integrated digital infrastructure, longitudinal studies of self regulated learning become labor intensive, error prone, and difficult to reproduce.

From an educational perspective, teachers and school staff require timely and interpretable information about the self regulation of learning profiles of their students. Raw questionnaire scores are rarely sufficient to support instructional decisions or targeted interventions. Instead, educators need summaries, distributions, and indicators of internal consistency that can be generated automatically and linked to specific courses and groups.

These limitations motivate the development of a web based platform specifically designed for the assessment of self regulation of learning. Such a platform must go beyond simple questionnaire delivery and provide an integrated environment in which test administration, data storage, scoring, and statistical analysis are combined within a single system. This design allows self regulated learning data to be collected in authentic classroom conditions while preserving the structure and quality required for educational research.

AutoReg was developed to meet these needs by providing a unified framework for administering self regulation of learning instruments, managing participants and courses, and producing research ready datasets and reports. In this way, the platform directly supports both classroom level monitoring and the systematic study of self regulated learning in real educational contexts.

### 1.2. Scope of the AutoReg platform

AutoReg is designed as a web based research and educational platform for the assessment and analysis of *self regulation of learning* in formal educational contexts. The system is intended to support the use of validated self regulation instruments in schools and universities, with a focus on classroom level monitoring, group level analysis, and longitudinal tracking of students.

The scope of AutoReg is restricted to the measurement of learning related self regulation, including cognitive, metacognitive, motivational, and behavioral components involved in academic activities. The platform does not aim to assess clinical, emotional, or personality related constructs, nor to provide diagnostic or therapeutic evaluations. Instead, it is conceived as a tool for educational research, instructional support, and evi-