

IMPLICATIONS OF CONTINUOUS ASSESSMENT THROUGH PEDAGOGICAL PRACTICE RUBRICS: EMPIRICAL EVIDENCE AND APPLICATION OF A MULTIDIMENSIONAL ANALYSIS¹

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ABSTRACT

It is now evident that there is a need for teaching-learning practices that aim develop the skills that students need to adapt to the demands of society and the competitiveness of the labor market. This research project conducted an empirical study to identify pedagogical practices that are associated with continuous assessment using rubrics as instruments for assessing of competencies within the university context. The evidence shows that there is a low evaluation quality and culture, few agreements regarding the reliability of the rubric, significant agreement on the effectiveness of the rubric for training purposes, and broad agreement regarding the feedback function, the need for teaching aids and policy support for the development of the rubric. The findings of this empirical analysis provide the first applied research evidence of the need to design educational policies to unify the criteria for outlining and applying a competency assessment model that will strengthen higher education practices in Colombia.

Keywords. Competencies in Higher Education, Teaching and Learning, Continuous Assessment, Rubrics and Quality in Education.

IMPLICACIONES DE LA EVALUACIÓN CONTINUA, A TRAVÉS DE RÚBRICAS SOBRE LAS PRÁCTICAS PEDAGÓGICAS: EVIDENCIA EMPÍRICA Y APLICACIÓN DE ANÁLISIS MULTIDIMENSIONAL

RESUMEN

En la actualidad se hace evidente la necesidad de prácticas de enseñanza-aprendizaje que apunten al fortalecimiento de las competencias de los educandos, necesarias para adaptarse a las exigencias de la sociedad y a los niveles de competitividad en el mercado laboral. La presente investigación efectúa un estudio empírico para identificar las prácticas pedagógicas que están asociadas a la evaluación continua, usando la rúbrica como instrumento de evaluación de competencias dentro del contexto universitario. La evidencia reveló que existe baja calidad y cultura de la evaluación, pocos acuerdos en relación con la confiabilidad de la rúbrica, mayor acuerdo en torno a la efectividad de la misma con propósitos de formación, amplio acuerdo en relación con la función de retroalimentación, necesidad de apoyos didácticos y apoyo político para el desarrollo de la rúbrica. Estos hallazgos aportan las primeras evidencias desde la investigación aplicada sobre la necesidad del diseño de políticas educativas conducentes a la unificación de criterios en torno a un modelo de evaluación por competencias para el fortalecimiento de este tipo de formación en la educación superior en Colombia.

Palabras clave. Competencias en la Educación Superior, Enseñanza y Aprendizaje, Evaluación continua, Rúbricas, Calidad en la educación.

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INTRODUCTION

It is now evident that there is a need to adopt teaching-learning activities that promote comprehensive education and the development of the skills that students need to adapt to the demands of society and the competitiveness in the labor market, which requires specific profiles and continuously updated knowledge. Higher Education Institutions (HEI) are expected to promote generic skills, as well as to strengthen specific cross-cutting skills, thereby improving employability, access to employment, and the attraction and hiring of talent, as an essential condition for effective social mobility and the harmonious development of a more responsible and sustainable productive and socioeconomic model, which poses real challenges for the university community and those responsible for designing public policies on higher education. (Castillo, 2012).

In this new competitive environment, the assessment of student learning acquires a new dimension compared to traditional approaches, which places the student at the center of the learning process, and requires new pedagogical practices to strengthen professional skills. Accordingly, continuous assessment becomes an indispensable tool for monitoring, guiding and strengthening current training processes and the quality of higher education. The Ministry of National Education of Colombia views evaluation as a linchpin of this process, providing a source of information about the development, scope, achievements and weaknesses of teaching-learning results, and an opportunity to innovate in educational activities.

This central objective of this study is to identify the implications of continuous assessment using the scoring rubric as a tool for assessing teaching practices in a selected HEI group. The study is organized into four parts: the first is this introduction, the second part provides an overview of the main theoretical and empirical contributions to the study of the issue, the third presents the methodological aspects, and the fourth presents a discussion of the results and conclusions.

Theoretical framework and state of the art

Few university teachers are aware of the concept of “rubric” as an assessment tool, or of the practical implications of its use in student learning. The rubric was adopted by universities in countries such as the USA, almost two decades ago, although it began to be used in primary schools in the 60s. Since then, there has been growing interest in the design, use and application of assessment systems in university classrooms, Torres and Reyes (2011). One of the findings is that little empirical work has been done in Colombia on the proposed relationship, while in the international arena the availability of literature on the subject is growing.

Torres and Reyes (2011) mention studies on the use of rubrics in the assessment of learning in higher education to confirm the reliability and validity of the instrument. Since Jönsson and Svingby (2007) published their meta-analysis on the validity and reliability of the rubric, several works have been published on this issue, such as Reddy (2011); Andrade (2010); Kerby and Romine (2010); Rezaei and Lovorn (2010); Stellmack et al., Cizek (2009), and Bessell et al. (2008). These authors conducted an exhaustive search of the major databases (ERIC, Web of Science, etc.), producing a total of 75 relevant studies. They concluded that the texts selected for their research had a low reliability coefficient, and that the use of rubrics was not sufficiently reliable to produce a conclusive evaluation.

Torres and Reyes (2011) obtained positive results regarding the achievement of skills using the rubric as an assessment tool, and concluded that students’ assimilation of the concept of learning-oriented assessment was an important factor. Other studies have also reported positive experiences involving the use of the rubric, with evidence demonstrating the achievement of student competencies, including by new students, (Rodríguez and Gil, 2011). Torres and Reyes (2011) understand that in such contexts, the use of the rubric for evaluation is a starting point for improving learning by students who are constantly growing professionally. However, states that these

studies do not provide clear evidence of validity or reliability, and, therefore, he based his research on these criteria.

Torres and Reyes (2011) established the following objective for his work: to study the validity and reliability of the rubric, aspects considered whenever instruments are used to collect information about students (Cizek, 2009). The analysis of different variables revealed that the rubric is a relevant, timely, consistent, clear and structured assessment tool that prepares the student professionally and that allows for the implementation of the pedagogical elements of the learning-oriented assessment approach (Gil and Padilla, 2008).

The exploratory study conducted by Andrade, H. & Du, Y. (2005) suggested that students use rubrics to support their own learning and academic performance. Students approved the use of rubrics and affirmed that they intentionally apply them to improve both their work and their grades. Some of the students stated that the matrixes have the potential to promote the self-regulation of behaviors such as goal setting, self-assessment and review. These results provide support to Stiggins (2001), when he confirms that students are “key users” of the evaluation, at least of rubrics, and that the evaluations reflect important aspects of academic self-regulation, planning and judgment.

In this regard, the rubric’s strength lies in its use to continually provide information to teachers and students about skills developed in a specific field of professional training. The rubric becomes a tool for monitoring teaching-learning processes and an input for reflecting on, researching and developing continuous improvements in educational practice. The positioning of this conception would reduce the number of students who perceive that the evaluation is often or always performed for the education system itself (88.2%) and for teachers (76.4%) (study presented by Porto, 2002).

The evaluation rubrics make it possible to assign different weights to each task or subtask performed in each academic activity. This allows students to

be aware of the evaluation criteria that will be applied in each educational activity, which help to determine the level of the skills that they have developed up to the time of the evaluation. The research conducted by Villalustre & Moral (2010) shows positive results from the implementation of rubrics, with 96% of students believing that knowing the deadlines for completing course activities as well as the evaluation criteria presented in the rubrics are very important elements in their learning process.

Recently, Reynolds (2010) conducted research to determine how students conceived of assessments using rubrics, and found that they were widely accepted, underscoring the importance of their use in the learning process.

The aspects considered in this research are critical, since teaching strategies and evaluations are important for the development and implementation of the teaching-learning process, function as didactic configurations, and establish dynamic relations between them, thus forming the main regular elements of pedagogy (Ortiz, 2009).

Throughout history, educational evaluation has been viewed as a specialized field, Santana (2002). This has facilitated the development of methods and models to guide the actions of the evaluator, as well as of research activities related to evaluation. Educational evaluation models are geared towards three core components of education: institutional assessment, program evaluation (curriculum, interventions) and the assessment of student learning, *Ibid.* (2002). Traditionally the field of educational evaluation has been conceptualized as institutional and program evaluation, Monedero (1998); while the evaluation of student achievement has evolved as a branch that, though related, is oriented more to psychometry – measurement and assessment (Resnick & Resnick, 1985).

Studies on the subject made by Pellegrino, J. et al. (2001), cited by Shepard (2006, p.40) argue that the interpretations and practices of continuous assessment should be based on a well-conceived mo-

del of student learning. They show how evaluation processes designed in advance make it possible to integrate coherent policies and pedagogical models that are conducive to enabling students to achieve academic results and/or skills assessed by external tests, as well as promoting research.

METHOD

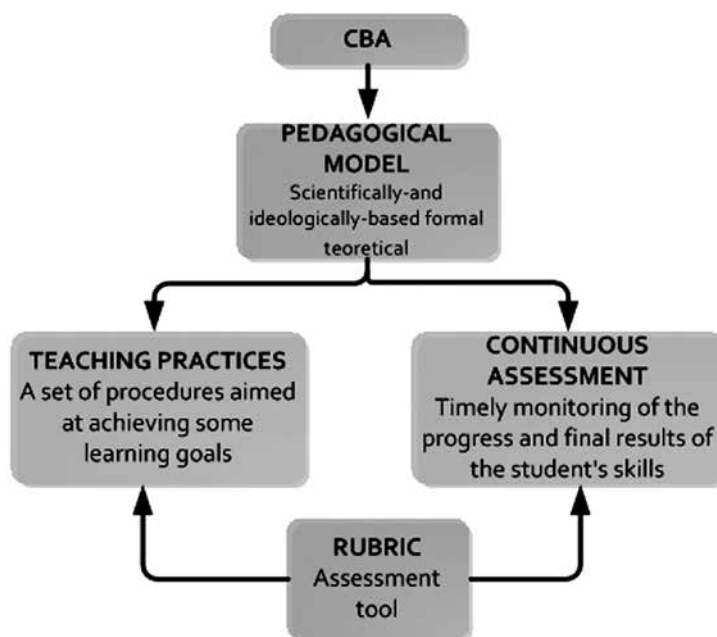
Since this research involved an empirical study to identify pedagogical practices that are associated with continuous assessment using the rubric as a tool for evaluating competencies within the university context, we identified relationships among five components: competency-based education, pedagogical model, pedagogical practices, continuous assessment and rubrics. In attempting to explain these relationships, it is necessary to place them in a specific level of hierarchy and interaction with the other elements involved. This is how teaching practices are determined by the curriculum and pedagogical model and, in turn, interact with continuous assessment, establishing general parameters in a two-way relationship for designing

and implementing the rubric as an assessment tool (See Figure 1).

Based on this relational model, we constructed a research instrument with 3 pillars and 51 variables related to teaching practices and the use of the rubric. The first pillar consists of nine variables, the second pillar 19, and the third pillar 23 (See Annex 1), all of which were used to evaluate selected respondents. Each respondent filled out the research instrument based on his/her experience with the rubric and the guidelines that have been followed in Higher Education Institutions in Colombia.

To identify the proposed relationships, we used a Principal Components factor Analysis (PCA), with information collected from a structured survey of 102 teachers who are experts on continuous evaluation and who have fully or partially incorporated the rubric as an instrument for assessing competencies in classrooms and virtual environments of Higher Education Institutions in Colombia. The variables were measured using a Likert scale.

Figure 1. Relationship Model



Source: GIEFES Group. Corporación Universitaria Autónoma de Nariño, Cali, Colombia

In relation to the principal components factor analysis, which was used in this study to analyze relationships among many variables and to explain these variables on the basis of a smaller number of variables (or factors) with a minimum loss of information, we used multivariate factor analysis techniques. Multivariate analysis methods were used to study the relationships among more than two variables. The PCA was characterized by the following elements:

1. The principal components are linear combinations of the original variables.
2. The main components do not correlate with each other.
3. The number of principal components should be at once small (for the analysis to be effective) and sufficient (to absorb most of the information from the initial variables).

DISCUSSION AND ANALYSIS OF RESULTS

The discussion of the results of the present study is based on the principal components derived from the application of the factor analysis.

Result 1. Component: Culture and Quality of the Assessment and Instructional Design

The results that can be observed in the non-hierarchical cluster graph show that a significant proportion of teachers gave a relatively low score to the variables related to the culture and quality of the evaluation. The teachers' scores for the Instructional Design factor are dispersed on both sides of the origin, reflecting that there is still no conceptualization that is shared and accepted by the involved community about the role of Instructional Design and its associated variables (theory, method, guide, socialization and coordination with the teaching model) in the new arrangement of the institutions for this form of evaluation management. See Graph 1.

From the results obtained it appears that the process of applying the rubric is still in its early

stages, and a culture of quality assessment has not been established among the groups of participating teachers, as intended by Law 1324 of July 13, 2009, which establishes the parameters and criteria for organizing the educational quality evaluation system, and issues rules for the promotion of a culture of evaluation, seeking to facilitate inspection and oversight by the state and to transform the ICFES.

The primary strength of the information gathered is that respondents are expert teachers who in most cases were trained in the design and application of the rubric, which makes the information collected sufficiently reliable.

Result 2. Component: Reliability and Training based on the rubric

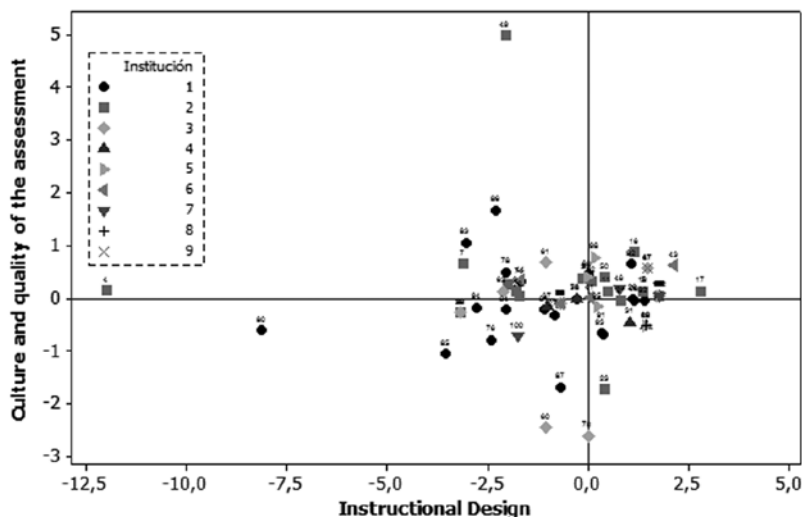
Two other latent variables related to the use of the rubric in the evaluation of the teaching-learning process were Reliability and Training. Was established that the first pair of variables (identified in Result 1) are related to the reliability of the rubric, and this second pair of variables is correlated with the training of students. The teachers' scoring of these two new variables is clustered in Graph 2.

Regarding Reliability, there is a wide dispersion of teachers to the left and right of the origin, which can be interpreted to mean that teachers still question the reliability of the rubric for the assessment of skills, and that there is little agreement regarding the rubric as an assessment tool.

This finding is consistent with the research results of Reddy (2011); Reddy and Andrade (2010); Kerby and Romine (2010); Rezaei and Lovorn (2010); Stellmack et al. (2009); Cizek (2009); and Bessell et al. (2008). These authors show in their research that the reliability of the rubric has a low coefficient, and they conclude that the use of the rubric may not be sufficiently reliable, as mentioned above.

Similar findings were made by Torres and Reyes (2011), who obtained positive results regarding the achievement of skills using the rubric as an assessment tool, and concluded that student as-

Graph 1. Variables associated with the Institutional Academic Management component



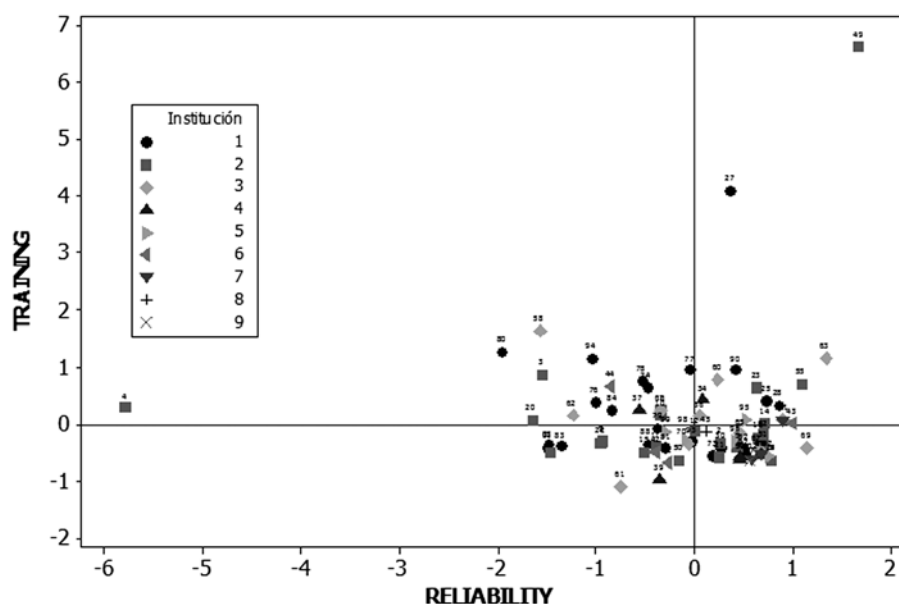
Source: GIEFES Group. Corporación Universitaria Autónoma de Nariño, Cali, Colombia

simulation of the concept of learning-oriented assessment was an important factor.

A grouping of teachers above and below the origin shows that there is greater agreement about the effectiveness of the rubric for the Training pur-

poses associated with this factor. Indeed, some studies report positive experiences in the use of the rubric, with favorable evidence of the achievement of competencies by students, including new students (Rodríguez and Gil, 2011). Torres and Reyes (2011) understand that in such contexts,

Graph 2. Variables associated with the Teaching-Learning and Evaluation component



Source: GIEFES Group. Corporación Universitaria Autónoma de Nariño, Cali, Colombia

the use of the rubric for evaluation is a starting point for improving learning by students who are constantly growing professionally.

Result 3. Component: Information and Feedback based on the rubric

The results observed for this component are reflected in a wide dispersion of teachers to the right of the origin (in the cluster of Graph 3), from which it can be established that there is broad agreement on the feedback function that the rubric performs when it is used as an assessment tool. This is confirmed by the location of the majority of teachers on the right side of the Graph. The results of this component are supported by the research of Andrade, H. & Du, Y. (2005), Stiggins (2001), Zimmerman (2000), which ratify the application and strength of the rubric in continuously informing teachers and students about the skills developed in a specific field of professional training. See Graph 3.

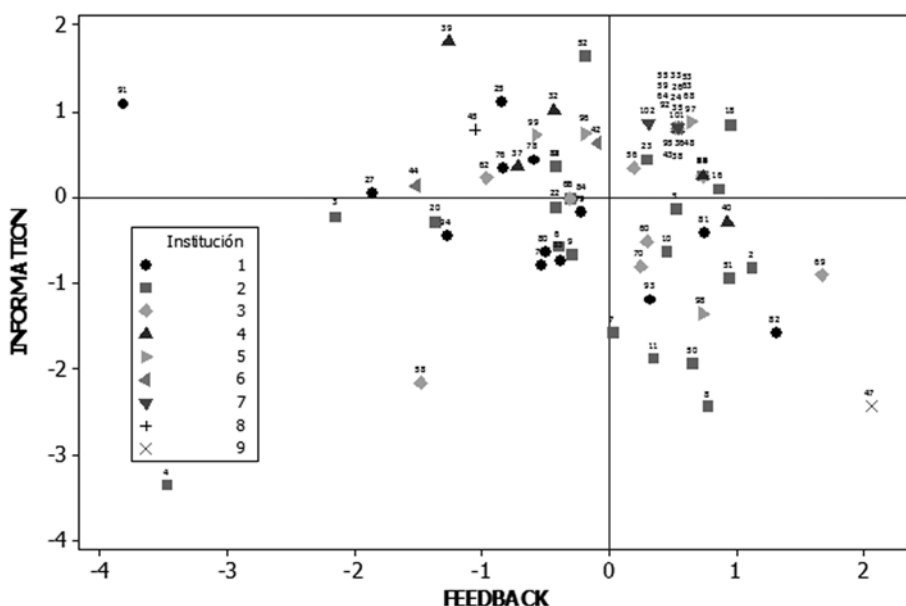
The exploratory study conducted by Andrade, H. & Du, Y. (2005) suggests that students use rubrics

to support their own learning and academic performance. Students approved the use of rubrics and affirmed that they intentionally apply them to improve both their work and their grades. Some of the students stated that the matrixes have the potential to promote the self-regulation of behaviors such as goal setting, self-assessment and review.

An important group of teachers graded the rubric as having great informative value for assessed students, as can be seen in Graph 3, supporting the study of Andrade, H. & Du, Y. (2005).

The attainment of information and feedback on the results of the educational process is (or should be) one of the main functions and results of the evaluation. As expected, and consistent with the theoretical framework developed for this research, the rubric has obvious implications in terms of pedagogical practices that promote the provision of feedback and information to students and teachers about their teaching-learning process. These results place the rubric in a privileged position in relation to methods of assessment.

Graph 3. Variables associated with the Teaching Methodology component (How, where, when)



Source: GIEFES Group. Corporación Universitaria Autónoma de Nariño, Cali, Colombia

Result 4. Component: Educational and Policy Support

The location of teachers in the different quadrants of the cluster graph can be interpreted to mean that a majority of teachers agree on the need for educational and policy support (regulations) in order for the rubric to achieve its main objectives (quadrants 1, 2 and 4 in a clockwise direction, in Graph 4.). This highlights the need for a regulatory framework for higher education that supports the development of the rubric.

The variables in each of the two components analyzed can be interpreted on the basis of their weight. The first component is related positively to the response to the following questions: “Based on your experience, rate the need for additional support for the design and development of rubrics (C50); and, “Teaching resources are necessary to design and develop the rubric and ensure the quality of the instrument” (C51). See figure 4.

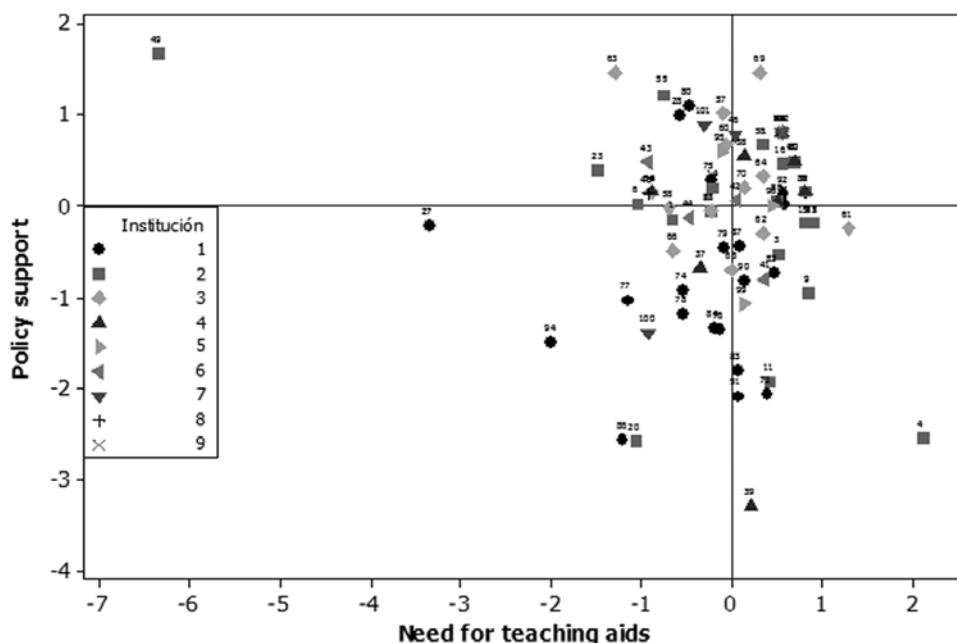
Policy Implications

Better research can lead to more effective public policies, specifically for higher education in Colombia. The results of this study represent the first steps in applied research towards justifying the need to design policies for the establishment of a regulatory framework that will lead to the unification of criteria for the design and application of competency assessment instruments that will strengthen higher education processes.

Limitations, perspectives and new lines of research

There is little institutional, faculty and student experience with the use of the rubric in continuous assessment in higher education institutions in Colombia, which is still in its early stages of development. The study found that the university with the most experience in using the rubric as a continuous assessment tool began designing and using the rubric just six years ago, while the

Graph 4. Variables associated with Educators, Learners and Resources component (For whom, with whom, with what)



Source: GIEFES Group. Corporación Universitaria Autónoma de Nariño, Cali, Colombia

other HEIs surveyed all had less than six years of experience. It is important to note that the HEI with the most experience offers a virtual educational modality and uses the rubric as its primary assessment tool.

The subjects of the research were teachers, experts in the use and application of the rubric, and only a few administrators. The survey did not cover the student body. In this regard, one of the recommendations for future studies of this subject is that they achieve greater coverage of administrators and students, with surveys specifically designed for this purpose.

CONCLUSIONS

The implications of continuous assessment through rubrics are evident in the results obtained from the principal component analysis, which determined that the Quality and Culture of continuous assessment are important variables associated with the use of the rubric as an assessment tool in teaching practice. In relation to the Instructional Design, the study established that there is no shared and accepted conceptualization (consensus) in the educational community with respect to its role in the design and application of the rubric and associated variables (theory, method, guide, socialization and coordination with the teaching model). This finding may lead one to think that the teacher's relationship with the variables has yet to be established, ruling out the possibility that the relationship is considered important.

Another quality of the use of this assessment tool is Reliability. The results show that the rubric still has a low level of reliability as an assessment tool among teachers, confirming similar findings in studies in other educational contexts. As for training, there is greater agreement on the effectiveness of the rubric for training purposes associated with this factor, as the development of skills allows students to behave with greater autonomy in making decisions, whether academic, social or personal, and that this can be improved and expanded if a certain level of competence is reached.

These results suggest the need for educational and policy support (educational regulations) for the rubric to achieve its main objectives and impacts. They also highlight the need for a regulatory framework that supports and encourages the development of the rubric in higher education section.

The results also evidence the need to strengthen the link between research and higher education policies in Colombia and to improve the way in which actors engage with each other for this purpose. Better educational research can lead to more effective public policies, specifically for higher education in this country.

The findings presented constitute the initial steps in applied research towards demonstrating the need for higher education policies that will lead to the unification of teaching criteria for the design and application of tools for the assessment of comprehensive skills-based education.

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APPENDIX 1

PILLARS AND MEASUREMENT OF THE VARIABLES IN THE RESEARCH INSTRUMENT

No.	PILLARS	COMPONENTS	TOTAL	
1	Identification of psychographic variables	0	9	9
2	Institutional Academic Management	Regulations	4	19
		Pedagogical guidelines	5	
		Learning environments	2	
		Evaluation system	1	
		Quality of the assessment	4	
3	Teaching-Learning process using the rubric	Evaluation culture	3	23
		What	1	
		Why	2	
		What for	4	
		How	4	
		Where	2	
		When	2	
		For whom	2	
		With whom	4	
		With what	2	
			TOTAL	51