University Students' Perceptions of Electronic Rubric-Based Assessment

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Abstract

Integrating technology into assessment processes in university contexts can change educational practices, in some cases by fostering self-regulated learning and in others by enabling more interactivity and participation among users. In this paper, we examine the opportunity to use electronic rubrics (erubrics) to assess learning. We report a student perception analysis on the process of assessment with electronic rubric at the university level. In this study, erubrics are applied in a Preschool (3-6 year-olds) and Primary Education (6-12 year-olds) pre-service teacher context. 87 students from two Spanish universities enrolled in a quarterly course of Education Technologies in the Faculty of Education used erubrics (© Gtea) for self- and peer assessment. Through a satisfaction survey, the study concluded that electronic rubric is an assessment facilitating resource for students as participants in the assessment process. Students tend to be satisfied with their use in both self- and peer assessment and acknowledge certain advantages regarding rubric features, implementation process and impact on learning process.

Keywords

Assessment rubrics, peer assessment, preservice teachers, self-assessment, user perceptions

Percepciones de los estudiantes universitarios sobre la evaluación basada en rúbricas electrónicas

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Resumen

La integración de la tecnología en los procesos de evaluación en contextos universitarios puede cambiar las prácticas educativas, en algunos casos mediante el fomento de la autorregulación del aprendizaje y, en otros, permitiendo una mayor interactividad y participación entre los usuarios. En este trabajo, se analiza la oportunidad de utilizar rúbricas electrónicas (erúbricas) para evaluar el aprendizaje. Se presenta un análisis de las percepciones de los estudiantes sobre el proceso de evaluación con la rúbrica electrónica en el ámbito universitario. En este estudio, las erúbricas se aplican en el contexto de la formación inicial del profesorado de Educación Infantil (3-6 años) y Educación Primaria (6-12 años). 87 estudiantes de dos universidades españolas, inscritos en un curso trimestral de Tecnología Educativa en las Facultades de Educación, utilizan erubrics (© GTEA) para su autoevaluación y la evaluación de pares. A través de una encuesta de satisfacción, el estudio concluyó que la rúbrica electrónica es un recurso que facilita la evaluación de los estudiantes como participantes en su proceso de evaluación. Los estudiantes tienden a estar satisfechos con su uso tanto en la autoevaluación como en la evaluación de pares y reconocen ciertas ventajas en cuanto a las características de la rúbrica, al proceso de implementación y a su impacto en el proceso de aprendizaje.

Palabras clave

Rúbricas de evaluación, evaluación de pares, profesorado en formación, autoevaluación, percepciones de usuarios

I. Introduction

All the changes that Higher Education is undergoing are related to a reconceptualization of teaching, learning and assessment (Gikandi, Morrow & Davis, 2011). Focusing on assessment, it is a concern with significant international repercussions and wide range responses some of which are more didactic and contextual. Students must have a leading role when assessing their learning process. Students have key roles in guiding their learning process (Jareño, Jiménez & Lagos, 2014), and thus generating their own feedback. Self-assessment and peer assessment are key factors in the achievement of formative evaluation.

It is necessary to focus on consider active student involvement in the assessment process due to its learning potential, because assessment processes are crucial in student learning, even more than objectives or teaching methods. It is relevant to improve assessment processes by means of technological innovation given the learning capacity it provides to all parties involved: students, teachers and educational institutions. In this context, technology maximizes benefits for everyone involved.

As a teaching objective or a process that promotes learning, assessment focuses on strategies that maximize learning opportunities and makes use of essential elements such as active student involvement, feedback and feed forward (Nicol & Macfarlane-Dick, 2006; Shute, 2008), self- and peer assessment (Dochy, Segers & Sluijsmans, 1999; Gámiz-Sánchez, Montes-Soldado, & Pérez-López, 2014; Holmes, 2015).

These elements, based on an open, flexible and mutual concept of knowledge, help adopt assessment processes that encourage participation and cooperation by using relevant criteria, for which technology, in general, and particularly electronic rubrics can be of great help. According to several studies in Spain (García-Ros et al, 2012; Gallego-Arrufat & Raposo-Rivas, 2014; Martínez, Tellado & Raposo, 2013), rubrics and in particular electronic rubrics, are amongst the most appropriate tools for self- and peer assessment in universities.

Electronic rubrics are alternative assessment tools that help teachers determine and explain what students are expected to learn and they provide pre-established performance criteria on how work will be assessed with concise and specific instances. Students can monitor their progress in terms of competences and know at all times what they must achieve and how to do so (Raposo-Rivas, Cebrián de la Serna & Martínez-Figueira, 2014). Electronic rubrics are, therefore, important when assessing students' work. They describe the specific characteristics of the learning outcome (a product, an assignment or a task) and the performance levels at which it can be achieved. Before tackling the task, they provide information on what standards should be met, how to assess performance, and after completion of the task, they provide feedback (Mertler, 2001; Andrade & Du, 2005, García-Ros et al., 2012).

At the university level, assessment rubrics provide different possibilities and can be used for different purposes: as a resource for comprehensive and formative assessment (Blanco & Ginovart, 2012; Moskal, 2000), as a guideline (Hafner & Hafner, 2003), as a working tool (Stevens & Levi, 2005; Rezai & Lovorn, 2010) and as a set of criteria rather than benchmark standard criteria (Simon & Forgett-Giroux, 2001).

According to Jonsson & Svingby (2007) using rubrics in assessment processes increases mark consistency, provides an accurate judgment of complex competences and promotes learning. The main conclusions are that: (a) reliable marks can be improved using rubrics, especially if they are analytical, specific to each topic and reinforced with examples and/or practice when assessing student's performance; (b) they don't provide a valid judgment of assessment *per se*. Nonetheless, valid assessment can be achieved by using a broader validity framework when validating rubrics; (c) they seem to have the capacity to foster learning and/or improve teaching. The main reason being they specify standards and criteria, which facilitates feedback and self-assessment.

Assessment rubrics give rise to debates on teaching-learning processes and foster students to reflect on their own ideas, which are essential features towards effective learning (Black & William, 1998). Teachers will also have access to new information sources in formative assessment, which will enable students to ascertain, adjust or amend perceptions of their work. They help students

learn and lead to greater self-awareness by delegating certain responsibilities on teachers or classmates.

According to a recent review of studies on the use of rubrics in formative assessment, Panadero & Jonsson (2013) report aspects whereby the use of rubrics improves student performance given that transparency increases, anxiety decreases, both the feedback process and self-regulation are reinforce and self-effectiveness improves. Furthermore, they group the factors of the moderating effects of rubric use, one of them being the reduction of student anxiety and the decrease of the level of "execution/avoidance of self-regulation". By means of transparency, there is also evidence that assessment rubrics are useful in guiding the learning process. Some studies confirm that students use rubrics to reflect on their comments, plan tasks and review their progress and assignments before submitting them, which can also have a positive effect on their performance (Steffens & Underwood, 2008). This means that rubrics are useful tools for self-regulation and help develop this capacity (Panadero & Jonsson, 2013) by explicating stating what is expected of them as well as the necessary indicators to verify achievement.

Hitherto we have seen the main contributions of electronic rubrics to students; however teachers do not feel likewise. Reddy & Andrade (2010), following a review of studies on the use of rubrics in Higher Education in a wide range of disciplines, and for various purposes, such as to further develop student performance or to improve teaching and program assessment. They note that the students´ perceptions of rubrics are generally positive.

We have detected that, studies do not often distinguish rubrics from electronic rubrics unless education methods (online, blended or classroom education) or support and diachronic availability differ. Cebrián-Robles, Serrano-Angulo & Cebrián de la Serna (2014) states that electronic rubrics promote greater interaction and help students become more autonomous when assessing their competences. At the same time, they provide teachers with detailed information, enabling them to establish which competences are difficult to acquire, and allow for more immediacy in the process of teacher-student communication.

A research carried out in an undergraduate course by applying an electronic rubric that was designed and semi-automated via Learning Management System to provide formative feedback (Atkinson & Lim, 2013). They confirm that rubric availability and online associated feedback promote communication and interaction with students regarding their learning progress and it was endorsed by a report on rubric-based assessment. However, it is note that while the majority of students like the structure, details and clarity of rubrics, some favor more freedom when tackling difficult questions. Therefore, given the prevailing dissimilarity in the opinions of students, teachers must be careful when determining the extent to which criteria and levels of performance should be structured.

This is the main reason why further research is needed on the views of students and on perceptions of both, teachers and students (Reddy & Andrade, 2010; Atkinson & Lim, 2013). Focusing only on students, Andrade & Du (2005), look into, how rubrics are used in focus groups of fourteen undergraduates to establish an approach to assessment, to check their work and guide as well as give thought to the feedback they get from others. Students claim that using rubrics helps them center on effort, on producing high quality work, on getting better grades and, therefore feel less anxiety. In addition, their comments reveal that most of them do not read the entire rubric and some regard it as a means to meet the demands of a specific teacher rather than a set of subject criteria and standards of a given discipline (Andrade & Du, 2005).

II. Purpose of this study

The basis of the current research and its objectives aim is to ascertain the opinion of students who are experienced rubric users and, in particular:

- To describe and comprehend the perception's student on the process of electronic rubric-based assessment.
- To determine the advantages and disadvantages issued by students and assigned to electronic rubrics in self- and peer assessment.

Participants give an overall rating to working with electronic rubrics, which enables us to take into account their opinions on learning-based assessment process as well as their views on electronic rubrics as the tool around which it is organized.

III. Methodology

The development of the current research on technology-based assessment employing electronic rubrics with groups of students from different universities has a technological and pedagogical component: the assessment tool itself (electronic rubrics) is highly regarded in online environments as learning processes can be monitored individually.

So a satisfaction survey has been applied to students participating in the evaluation process. That students employed electronic rubrics in the application *eRubric* to assist peer and self-assessment in:

- Cross-disciplinary competences such as teamwork, oral presentations and proficiency in a second language.
- Specific subject competences regarding different content.
- Competences related to different methods, activities and projects.

a. Design of electronic rubrics in the study

The application named *eRubric*[1] (figure 1, 2, 3) was designed by the University of Málaga (Cebrián-Robles, Serrano-Angulo & Cebrián de la Serna, 2014) in a federated environment (©GTEA[2]). It is used as the technological support tool via SIR, RedIRIS Identity Service (in Spain) and EduGain (in Europe). Currently any European Higher Education Institution can access and utilize *eRubric* (©GTEA) with their institution identification data. This application is available in several languages (English, Spanish, Portuguese, Swedish...).

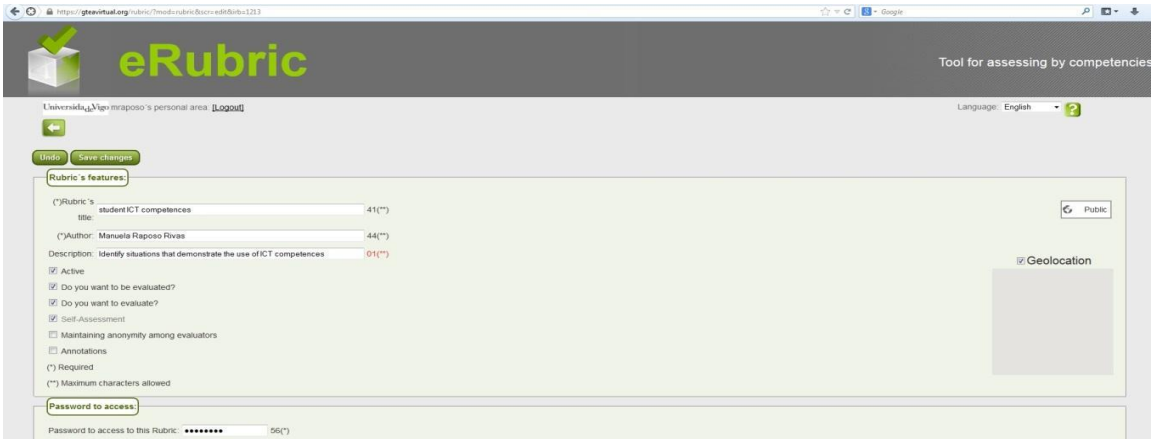

Figure 1. Title, description and user interface.

Figure 2. Competences, evidences and assessment criteria interface.

[1] https://gteavirtual.org/rubric/
[2] GTEA= Research group on globalization, technology, education and learning, University of Málaga, Spain

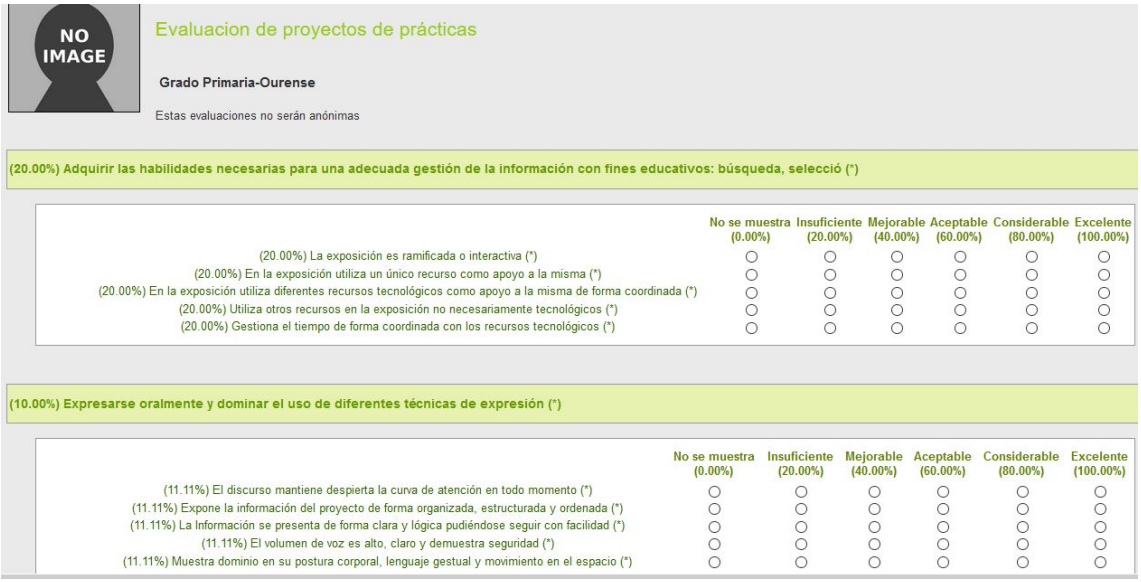

Figure 3. Assessment area in eRubric

b. Participants and instrument

The study is part of a broader research project[3] which aims to test and assess the academic scope of electronic rubric in different contexts of Higher Education. It was carried out in the first stage of teacher training in subjects related to the use of ICT in two universities, one in the North and the other in the South of Spain.

The teachers involved in this study share the design of the subject by using the same resources, didactic sequence and textbook (Cebrián & Gallego, 2011) as well as a "team teaching" methodology (when lecturing on "monographic activities") and PBL (Project-based learning) for oral presentations during practical sessions.

Fifty-six students participated in the study by voluntarily completing survey (64.3% of the undergraduate students' focus group). A satisfaction survey (Gallego-Arrufat & Raposo-Rivas, 2014) was presented to students at the end of the term and experts who used an experimental application (Martínez, Tellado & Raposo, 2013) validated it.

The application protocol of the survey consists of students' anonymous and individual activity, in a virtual environment or through a paper-and-pencil administration. It was carried out after the end of the subject course but before knowing its final score.

In this study we analyze the data obtained from three questions; the first one rating the level of student satisfaction with electronic rubric-based assessment (0-4 scale), its reliability being 0.814 (Cronbach's alpha); the second is an open-ended question on the advantages and difficulties they encountered and the third soliciting an overall rating (0-10 scale).

c. Data analysis

A descriptive analysis was carried out on closed-ended questions, whereas open-ended questions were subjected to a content analysis (Krippendorff, 2012) and codes and subcodes were development for data analysis (Table 1). The study descriptors include six codes with several sub-codes:

[3] Project "Federated eRubricService to Assess University Learning". R+D+i Plan, reference number EDU2010-15432. It's currently has continued in the R & D project "Study of the impact of the erubricas Federated in assessment of competencies in the practicum" (2014-17) [reference number EDU2013-41974-P]. For futher details, the site http://erubrica.uma.es may be visited.

1. Features of the rubrics and implementation process: Effectiveness, Usefulness, Objectivity, Convenience, Innovating, Formative, Fair/Unfair, Motivating/Unmotivating, Incomplete, Easy/Difficult, Simplicity/Complex, Fast, Concision, Rigidity and Injustice.
2. Type of assessment: Objective, Non-objective/Subjective, Self-assessment and Peer assessment.
3. Process of assessment: Lack of information, Incomplete, Feed-back, Reflection and Lack of time
4. Ethics of assessment: Accuracy/Inaccuracy, Veracity, Earnestness and Sincerity/Insincerity
5. Effects on the learning process: Diverse learning, Team work/Lack of team work, Participation, Awareness, Corrects weaknesses, Increases learning capacity and Self-concept
6. Values: Responsibility, Sincerity, Self-improvement, Criticism/self-criticism, Fellowship and Effort

Two researchers independently coded the data and subsequently, coded six cases from the other investigator. The intercoder agreement for each case reviewed rated higher 85-percent criterion and the average Cohen´s Kappa coefficient being 0.86.

The analysis of topics is intended to contrive the ratings and opinions of students on being assessed with electronic rubric and the advantages or positive aspects and disadvantages or negative aspects ascribed to the use of electronic rubric in self- and peer assessment.

IV. Results

The results from the analysis of the students' perceptions of electronic rubric-based assessment are shown below.

Table 1. Frequency of codes and sub-codes

Codes	Sub-codes	eRubrics in Peer assessment		eRubrics in Self-assessment	
		Advantages	Disadvantages	Advantages	Disadvantages
Features of electronic rubrics and implementation process of electronic rubric-based assessment	Effectiveness	7	-	5	-
	Usefulness	4	-	4	1
	Objectivity	-	2	3	1
	Convenience	6	-	7	1
	Innovating	3	-	3	3
	Formative	2	1	3	1
	Fair/Unfair	1	5	1	2
	Motivating/ Unmotivating	4	4	5	5
	Incomplete	-	3	-	3
	Easy/Difficult	6	10	10	17
	Simplicity/Complex	3	7	5	15
	Fast	16	-	11	-
	Concision	5	-	5	8
	Rigidity	-	15	-	7
	Injustice	-	5	-	5
Type of assessment	Objective	12	2	5	1
	Non-objective/ Subjective	3	21	1	18
	Self-assessment	2	-	11	3

Codes	Sub-codes	eRubrics in Peer assessment		eRubrics in Self-assessment	
		Advantages	Disadvantages	Advantages	Disadvantages
	Peer assessment	15	5	2	-
Process of assessment	Lack of information	-	9	-	3
	Incomplete	-	1	-	-
	Feed-back	10	-	13	3
	Reflection	1	-	16	1
	Lack of time	-	3	-	4
Ethics of assessment	Accuracy/Inaccuracy	4	15	3	10
	Veracity	1	4	-	5
	Earnestness	2	3	1	2
	Sincerity/Insincerity	5	6	6	8
Effects on the learning process	Diverse learning	21	2	16	3
	Team work/Lack of team work	20	12	11	5
	Participation	11	1	3	4
	Awareness	6	3	13	2
	Corrects weaknesses	7	-	10	1
	Increases learning capacity	16	1	13	-
	Self-concept	2	1	5	3
Values	Responsibility	4	5	14	4
	Sincerity	5	6	4	7
	Self-improvement	4	-	15	1
	Criticism/Self-criticism	8	4	18	6
	Fellowship	10	15	5	3
	Effort	2	3	2	3

Most students rated the use of electronic rubric-based assessment satisfactorily when they accessed federated application *eRubric* (©Gtea) in each of the universities (Figure 4) and specified the advantages and disadvantages of electronic rubric-based assessment in self- and peer assessment.

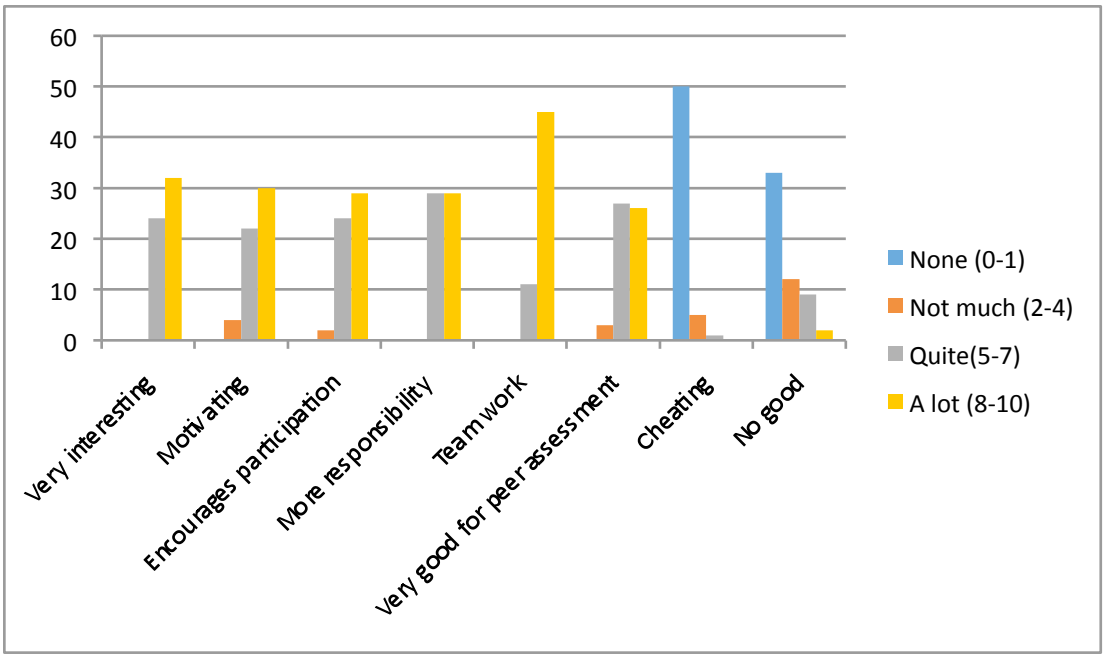

Figure 4. Student perception of electronic rubric

Results display a high level of satisfaction, with a similar trend in both contexts, especially in aspects regarding its appropriateness in teamwork, followed by interest, motivation, fostering responsibility and student participation. Uselessness "is of no use" or subjectivity and/or cronyism "cheating" are also some of the opinions emitted on the use of electronic rubric.

a. Advantages and disadvantages in peer assessment and self-assessment

Advantages of electronic rubric in peer assessment: They are broadly related to the effects on the learning process, i.e., the impact on education, as it helps students learn how to work as a team and to be more cooperative, improving, therefore teamwork. It helps students "learn from others", given the following comments: "it allows you to compare your work with your classmates", "you learn other ways of doing what is being asked", "see other students' mistakes and try not to make the same mistakes", "you learn different things" and "you know how to tell a classmate what is going wrong". In general, students notice that class participation increases and they have an insight into the assessment process itself. It also enables them to work on values such as "responsibility" and it promotes "more sincerity". They emphasize that it is "effective", "useful", "authentic", "positive", "innovating", "fair", "motivating", and "handy" and the implementation process is "quick and user friendly".

Disadvantages of electronic rubric in peer assessment: They could be summarized with the following statement: "It does not assess properly". Students encounter certain limitations due to grade scoring and impartiality: "Sometimes I find it hard to be objective" and "opinions are not always fair". In regards to specific peers, they add, "You do not assess correctly if you dislike the person" and "affinity with colleagues may prevail when assessing their work".

It is believed that electronic rubric "reflects inter-group problems" or "can create conflicts", thus comments such as: "assessment is contingent" and "cronyism" often turn up. There is also negative criticism judging such as "being unable to see the full process". The time factor together with the ethics of the assessment and the lack of accuracy or veracity are also relevant. Students believe that "you might have been assessed without prior consideration of the work carried out", "you can assess inaccurately, if you do not consider the requested aspect", "you do not always tell the whole truth about the final result and what each person has really done". In relation to the tool, students said, "some questions are vague".

Advantages of electronic rubric in self-assessment: Approximately one third of the students respond it helps them detect, identify or correct mistakes, failures, problems or shortcomings in their work. They claim: "I can see some of the mistakes I made" or "it enables you to establish areas of failure in order to improve them". Students also point out that the learning process

increases and improves; thereby confirming that the impact on learning is quantitative, more learning, and qualitative, better learning. Other students said that electronic rubric allows them "to correct and change inadequate learning strategies" and "to consider additional progress". Electronic rubric promotes self-appraisal and is useful "to reflect on the work carried out" and "to detect mistakes in order to correct them". As it fosters their self-concept, they come to appreciate their work, their effort and themselves more. It also encourages values such as responsibility, self-improvement and self-correction. Students also denote that certain advantages in self-assessment derived from electronic rubric: promptness, usefulness and simplicity.

Disadvantages of electronic rubric in self-assessment: Limitations, difficulties and disadvantages do not refer so much to electronic rubric but rather to problems associated with a false self-concept or dishonesty. They claim that "in self-assessing you only tend to see the good things", "you can bring your grades up" and "think you did something well and not be so". The absence of self-criticism can be decisive in the outcome of the assessment process, which is considered subjective at times. To a lesser extent they mention limitations on the instrument because "some questions are not accurate", "there are not enough options" or "rating scales are not too scaled up" and miss not having the option of an intermediate score i.e., all-or-nothing according to the question. Some students believe the process "is complex".

b. General opinion on electronic rubric-based assessment

Almost one in three students (72.4%) is satisfied with the use of electronic rubric-based assessment. They consider the use of rubrics positively because it is a learning experience and can also be adopted to distinguish specific assessing features and lead to more formative, objective and conscious assessing. The *educational value of electronic rubrics* is emphasized as students maintain: "We can see where we went wrong and what we must change in the future to do the work", "the possibility of getting feedback", "it is a very positive to assess ourselves and also others in order to learn and become aware of how we can improve", "it is useful in terms of progress and you ponder on what you did right and what you did wrong" and "it helps us develop a critical attitude and take note of our mistakes". The knowledge acquired during the *assessment process* itself is regarded likewise: "It is interesting to assess peers because we become aware of the difficulty it entails".

Electronic rubric is considered to be of great help when conducting a *detailed analysis of the object being assessed*: "It is necessary to assess all aspects and, at the same time, take into account specific ones". It detracts subjectivity from the assessing process "because it is designed so that we can objectively and consciously assess both our team and others", "we learn to be objective and to establish a criterion" and "it enables us to assess everyone with the same criteria". They appreciate the fact that it also *fosters* certain *values* "because it promotes activity engagement and it is fair as it enables us to assess the team as well as others". Students also deliver positive feedback on electronic rubric in self- and peer assessment separately. For instance, in the case of a student who says: "I think it's great, and peer assessment is a good way to take a look at other assignments, assess them and didactically compare them to yours in order to learn from peers. As for self-assessment, it is also very useful as it allows me to spot the short comings in my work or the things I did well". Another student claim sthat: "When I assess my work I can see those things I have not fully explained and I should have, therefore in the future assignments I will take into account aspects I had not considered important beforehand. I believe that peer assessment is useful to analyze other points of views". The overall rating also denotes that using this resource the *assessment process* is handy, simple, different and prompt: "It´s a quick way to assess both peers and ourselves".

Only a 16.1% of the students remain indifferent towards the experience as: "Team, class and teacher assessment is OK, but it is not vital". They question its use: "I think it is not taken into account" and their own capacities as well as the content of the activity: "It is something I have never done before and much less online, we could assess others individually or as a team by using different criteria depending on the assignment, however the criteria were very similar as all the assignments fostered the same objectives".

Finally, 11.5% of students have a negative opinion on using electronic rubric due to the enclosed nature of the resource as "no clarifications could be made". It was also regarded negatively due to students role as some of them admit that "there are preferences among peers", while others conclude: "I do not think peer assessment is suitable as we do not have sufficient knowledge to

assess other students´ assignments" or "some students can improve their marks by simply awarding themselves higher grades".
The quantitative overall assessment of the experience was included in one of the items in the survey on a scale from 0 to 10. Figure 5 displays that 28.57 % of the students assign electronic rubric-based assessment a score of 9. One out of three students is very pleased with the use of electronic rubrics in self- and peer assessment (9-10). Given that about half of the participants (50.2%) give electronic rubric-based assessment a high rating (7-8) we get very satisfactory overall perceptions (83.1%). It should also be noted that none rated electronic rubric-based assessment less than 5.

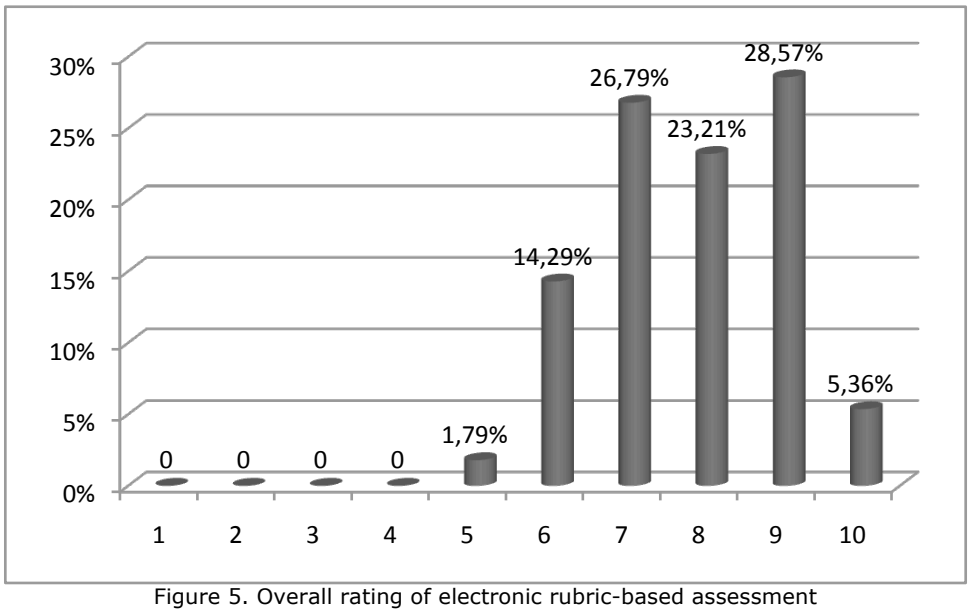

Figure 5. Overall rating of electronic rubric-based assessment

V. Discussion and conclusions

As far as integrating ICT into assessment processes is concerned, the changes that Higher Education is undergoing nowadays require both new assessment techniques and resources (Jonsson & Svingby, 2007), among which we can include self-assessment and peer assessment strategies based on electronic rubrics. However, it is important to underscore that technology in general, and electronic rubrics in particular, on its own will not bring about a paradigm shift in assessment practices. Authentic learning will not take place unless technology is combined with formative assessment and self- and peer assessment systems.

The theoretical framework for applying alternative assessment processes in the classroom should see students as knowledge creators; seek authenticity in materials and activities; employing dynamic and on going assessment tools and empower students. By putting these ideas into practice, specific features such as initiative, choice, perception, self-discipline, compassion, trust, and spontaneity can be fostered (Janisch, Liu & Akrofi, 2007).

Participants from both universities were pleased with their assessment; they generally deemed the use of electronic rubrics positively with assertions that coincide with the advantages of the process. They highlight the impact on their learning process along with features that can be ascribed to electronic rubrics as an assessment tool: "fairer", "more objective" and "more conscious".

Students participating in the study hold that electronic rubrics have a benefit in the assessment processes, i.e. the advantages of peer assessment are different from those of self-assessment, but nonetheless they correlate. In peer assessment, the results obtained in both universities underscore the matrix features as well as the implementation process along with the impact on their training process by means of learning "from" and "with" others. It can also be noted that class participation increases and students gain an insight into the assessment process. In this sense, it is important to develop a culture of assessment in students by means of which they will

feel more qualified and at ease when assessing their work or when issuing and receiving constructive assessment from their peers (Evans, McKenna & Oliver, 2005).

In self-assessment, all the participants emphasize that the main features of the electronic rubric implementation process are key factors in the matter of promptness, user-friendliness, simplicity, objectivity, etc. together with its usefulness in improving both qualitative and quantitative learning and training, self-assessment and in fostering values such as responsibility. These results agree with the study of Naomi Holmes (2015). Our study advocates, as does Luttenegger (2009) the convenience of ongoing research in the area of formative assessment practices with student teachers. Albeit the progress attained in this research rests on the resource employed informative assessment with which pre-service teachers are fully satisfied. The level of students' satisfaction was not affected by the independent variables gender and age. Yet, there was significant discrepancy in the level of satisfaction in students who had on-the-job experience in contrast to those with no experience. It would be interesting to compare results before and after field experiences in pre-service teachers. These can be ideas to explore in a future paper.
In conclusion, as Andrade & Du (2005), our research evidence that students employ rubrics to reinforce their learning and academic performance. Another particularly interesting topic for future studies would be to determine the connection between student satisfaction and academic performance.

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