STRENGTHENING THE CRITICAL THINKING COMPETENCE G15 USING SOCIAL MEDIA AND ITS ASSESSMENT BY CORUBRICS

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Abstract

The Bologna process and the European Higher Education Area (HEA) aim to align the evaluation with the competences that the student needs to acquire during the teaching-learning process. In this sense, in previous projects we observed that G15 competence of critical thinking needs to be strengthened in the Agriculture students at the University of Valladolid in Spain. On the one hand, to strengthen the G15 competence, the teachers have confirmed that social media, due to students' familiarity and interest, can be used to create students' own innovative recommendations and critiques and to improve students' critical thinking. In this line, the young people in Spain recognise an intensive use of electronics and the 90% of them own 2-5 electronic devices. The most popular social media are, Facebook with 2,271 million users in 2019, Youtube with 1,900 million, WhatsApp with 1,500 million and Instagram with 1,000 million. On the other hand, there is unanimity in the scientific community on the need to improve the quality of the assessment in Higher Education, revising and revamping the evaluation by means of diverse, varied and innovative assessment tools aligned with competences that the students need to acquire. In this sense, rubrics are recognized tools that evaluate the learning process aligned with the competences-based learning model. Rubrics allow students to self-monitoring their learning process contributing to their teaching responsibility and to self-evaluate their work quality and possible improvement. In this sense, CoRubrics is a digital tool that allows obtained the students self-evaluation, teachers-evaluation and students co-evaluation. This paper presents a Teaching Innovation Project that aims to strengthen the G15 competence of critical thinking by means of social media and its evaluation using the CoRubrics tool in the Higher Education Agriculture students at University of Valladolid. The methodology of the project included, i) the inclusion of an activity of critical thinking using social media in the subject practices, ii) the creation of a rubric for the assessment of the competences needed to acquire by students, iii) the implementation of the activities and rubric by the Higher Education of Agriculture students of Valladolid University, iv) the teachers evaluation and students co-evaluation and v) the comparison, discussion of the results and conclusions by teachers. The results showed the students' high interest in activities using social media enhancing the G15 competence of critical thinking within the improvement of the students' self-evaluation and evaluation of their own progress. Moreover, it was proved the consciousness-raising of the teachers to align the evaluation with the competences to be acquired by the students.

Keywords: Innovation, teaching project, evaluation, social media, CoRubrics.

1 INTRODUCTION

European Commission communication "An agenda for modernising the EU's higher education systems" emphasizes the need to align the assessment with the competences that the students need to acquire (EACEA, 2014). In doing so, rubrics are recognized tools that evaluate the learning process aligned with the competences-based learning model (Valverde and Ciudad, 2014). Rubrics are assessment tools that allow, i) the involvement of all the participants in the assessment process, ii) the alignment of the assessment with the teaching-learning process, iii) the students self-monitoring of their learning process contributing to their teaching responsibility and iv) the student self-evaluation of their work quality and possible improvement.

On the one hand, in a previous project, we observed a weakness in the competence of critical thinking (G15) in students. G15 competence of critical thinking needs to be strengthened in Agriculture students at University of Valladolid in Spain. Therefore, we propose to include activities in the teaching-learning process in order to strengthen the G15 competence. In this line, we think that social media, due to students' familiarity and interest, could be used to create students' own innovative recommendations and critiques and to improve students' critical thinking. The study developed by Aid against Drug Addiction Foundation, Google and BBVA in the framework of the Connected Project

(Proyectoconectados.es, 2019) shows that the 90% of the adolescents in Spain own 2-5 electronic devices, standing out smartphone in the first position (89.9%), followed by laptop (76%) and tablet (69%). Most of them recognised an intensive use of mobile telephone (83.6%). The most popular social media are, Facebook with 2,271 million users in 2019, Youtube with 1,900 million, WhatsApp with 1,500 million and Instagram with 1,000 million (marketing4ecommerce, 2019).

On the other hand, in the previous project we proved the compliance of rubrics to assess the competences that the students need to acquire in the learning process. Previous project demonstrated the rubric validity to improve the understanding of the expected learning results, providing teachers a continued, varied and collaborative assessment tool aligned with the competences-based learning model (Reddy and Andrade, 2010). Nevertheless, we confirmed our need to go in depth into the rubrics for their generalisation in the assessment (Urbano et al., 2019). Moreover, we understood our necessity to use proper tools to simplify the assessment, data gather and treatment for the generalisation of the use of rubrics. In the previous project we used the Rubrics software to create the rubric, then the software Jotform for digital data gather and finally, the SPSS 24.0 software to treat the data. In this context, we search an easier, functional and effective tool to simplify the management of the evaluation and the treatment of the information generated by the rubric regarding Rubric tool. Therefore, in this innovation teaching project we propose to test the free access software CoRubrics for the compilation and treatment of the data of the evaluation, checking its simplicity and functionality from teachers' and students' viewpoint. Background shows CoRubrics is a digital tool that allows, i) create the rubric, ii) launch it to students and teachers by mail for evaluation, iii) data gather from students self-evaluation, teachers-evaluation and students co-evaluation, iv) assign a weight to each item measured and v) get the weigh averages of the students self-evaluation, teachers-evaluation and students co-evaluation.

This paper presents a Teaching Innovation Project that aims to strengthen the G15 competence of critical thinking by means of social media and its evaluation using the CoRubrics tool in the Higher Education Agriculture students of University of Valladolid.

2   METHODOLOGY

The Teaching Innovation Project followed a linear methodology. In a first step, the competences needed to be acquired by the students were identified. In doing so, a HE teachers' focus group was developed and a data base of competences and skills for the assessment was created. After the selection of the competences and skills, a rubric was developed using CoRubrics in order to assess the acquisition of competences by the student in two ways, i) by the rest of the students in the classroom, co-evaluation and ii) by the teachers. The table 1 presents the competences to be assessed and competences codes according to the Degree and Master codification, within the skills description and its codification by the teachers' focus group.

A specific activity of analysis using social media was included into the subject's practices in order to assess the students' critical thinking and motivation with the use of social media in the context of subjects practices.

Table 1. Competences assessed by Teaching Innovation Project 2019-20.

Competence code	Competence description	Skill code	Skill description
G15	Critical thinking	I0011	Economic feasibility
G3	Summarise and synthesise	I0010	Technic feasibility
G5	Communicate in expert and non-expert forums	I0002	Oral presentation
G15	Critical thinking	I0020	Social media analysis

In order to test the rubric, HE students in Agriculture at the University of Valladolid were chosen to implement the rubric assessment. A sample of Higher Education students at the University of Valladolid participated in the assessment using rubrics and social media. A total of 40 students from Agriculture Degrees (25) and Masters (15) assessed the competences to be acquired using the rubric created by CoRubrics (Table 2).

Table 2. Description of the students participating in the Teaching Innovation Project 2019-20.

Degree/Master	Subject	Male	Female	Total	Valid sample
Degree in Agricultural Engineering (GIAMR)	Commercialisation	13	3	16	14
Degree in Oenology (DO)	Marketing	6	5	11	11
Master of Advance Technologies (MTA)	Rural development	2	0	2	2
Master of Food Quality/Development (MCDA)	Marketing	2	11	13	13
Total		23	19	42	40

The rubric was delivered to the students at the beginning of the trimester using the University of Valladolid Moodle platform. Once, the students presented their subject practices to the classroom, all the students and the teachers were invited to give marks using CoRubrics template. CoRubrics output the students´ co-evaluation and the teacher's evaluation for each student. For the comparison between students and teacher marks, Degree and Master, male and female, the t-Student test was used. The SPSS 24.0 software was used for the statistical analysis.

The methodology of the project included, i) the inclusion of an activity of critical thinking using social media in the subject practices, ii) the creation of a rubric for the assessment of the competences needed to acquire by students, iii) the implementation of the activities and rubric by the Higher Education of Agriculture students of Valladolid University, iv) the teacher evaluation and students co-evaluation and v) the comparison, discussion of the results and conclusions by teachers (Figure 1).
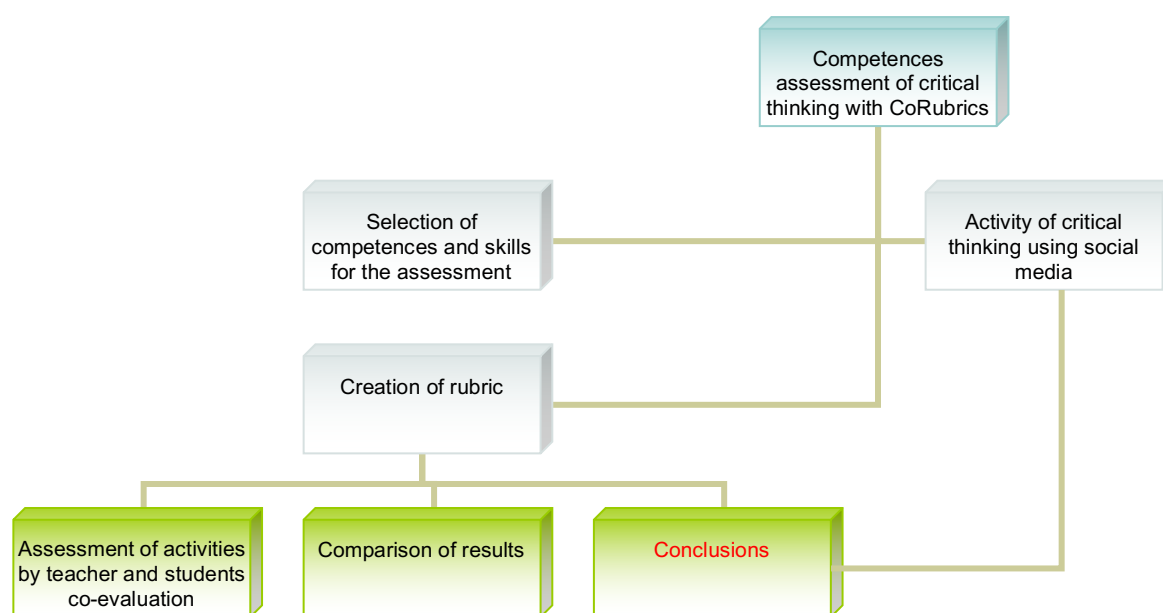

Figure 1. Methodology of the teaching learning project "Strengthening the critical thinking competence G15 using social media and its assessment by CoRubrics".

3   RESULTS

The teachers' feedback of the inclusion of an activity of social media analysis in the subject practices revealed a high motivation and appreciation by the students. The students declared that they spent time surfing in internet, observing sector companies communication, reading comments and obtaining their own conclusions. They declared that they didn't imagine that agriculture companies used social media for communication, information and knowledge share. They learnt about the sector and its activities obtaining their own opinion that could help them in their near future access to the labour market.

According to the competences evaluation, the results show that the students gave higher marks than teachers. It was found that teachers gave significantly different marks for the G5 competence of communication in expert and non-expert forums for the students' oral presentation of their work and the G15 competence of critical thinking by social media analysis (Table 3).

Table 3. Comparison of the average marks given by students and teacher.

Competence	Student	Teacher	t-Student (Sig.)	Degrees of freedom
G15: Critical thinking. Economic feasibility	3.60	3.30	1.783 ns	43.901
G3: Summarise and synthesise. Technic feasibility	3.57	3.33	1.577 ns	46.931
G5: Communicate in expert and non-expert forums. Oral presentation	3.59	2.87	4.298***	78.000
G15: Critical thinking. Social media analysis	3.59	2.68	5.987***	78.000

Significance level *$p<0.05$ **$p>0.01$, ***$p=0.000$, ns not significant.

The result of the communication competence could be explained due to the students' perception of their ability to communicate in experts forums which are relatively unknown for them by now. In their oral presentations, the terms used by students were sometimes very colloquial, lack of content, with many changes of direction and evading the core of the topic.

In the case of the differences in the social media analysis, the results could be explained due to students' perception of their knowledge and expertise of social media skills whilst the competence that was assessed by the teacher was the student critical thinking and their innovative recommendations and critiques as it was exposed above (Figure 2).
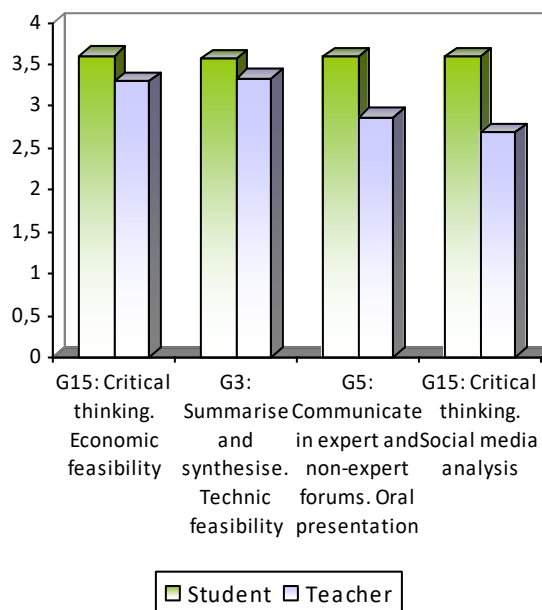

Figure 2. Students and teacher evaluation of competences.

Nevertheless and although generally the students gave higher marks than teacher, exceptionally in the critical thinking of economic feasibility in Degree of Oenology (3.85 against 3.91) and the ability to summarise in the Master of Food Quality and Development (3.40 against 3.62) teacher gave higher marks than students. In their comments, the students eulogise their colleagues' work, which help them to learn and progress while seeing the ways to improve their own work observing critically thinking similar others work (Table 4).

Table 4. Average of the results of the competences assessment by teacher and students.

Competence	GIAMR		DO		MTA		MCDA	
Evaluation	Coev.	Teacher	Coev.	Teacher	Coev.	Teacher	Coev.	Teacher
G15: Critical thinking. Economic feasibility	3.48	3.17	3.85	3.91	3.50	3.50	3.55	3.38
G3: Summarise and synthesise. Technic feasibility	3.45	3.33	3.86	3.64	4.00	3.00	3.40	3.62
G5: Communicate in expert and non-expert forums. Oral presentation	3.56	3.00	3.78	3.09	4.00	3.50	3.41	2.92
G15: Critical thinking. Social media analysis.	3.54	3.08	3.86	2.55	4.00	2.50	3.35	2.85

The results show that Degree students gave higher remarks than Master students for all the competences analysed. Nevertheless, the differences between Degree and Master' marks resulted statistically significant only for the critical thinking of social media analysis.

This result could be explained due to the age and "supposedly" maturity of Degree and Master's students. It is expected that critical thinking is increased with level of knowledge and age. Result confirms the Masters' student higher critical thinking than Degree students (Table 5).

Table 5. Comparison average marks given by Degree and Master' students.

Competence	Degree	Master	t-Student (Sig.)	Degrees of freedom
G15: Critical thinking. Economic feasibility	3.64	3.54	1.277 ns	35.382
G3: Summarise and synthesise. Technic feasibility	3.63	3.48	1.545 ns	29.876
G5: Communicate in expert and non-expert forums. Oral presentation	3.66	3.49	1.700 ns	23.414
G15: Critical thinking. Social media analysis.	3.68	3.43	2.711*	28.616

Significance level *$p<0.05$, ns not significant.

Generally, males gave higher marks than females. Despite for oral presentation, females gave higher marks than males.

By gender it was found a significant different in the assessment of social media, males gave significant higher marks for social media critical thinking than females (Table 6).

This result could be explained due to the gender bias in technological contexts proved by Pérez-Carbonell and Ramos-Santana (2015), where females were presented with less technology skills than males.

*Table 6. Comparison average marks given by gender. Significance level *$p<0.05$, ns not significant.*

Competence	Male	Female	t-Student (Sig.)	Degrees of freedom
G15: Critical thinking. Economic feasibility	3.61	3.60	0.142 ns	36.618
G3: Summarise and synthesise. Technic feasibility	3.59	3.56	0.286 ns	37.050
G5: Communicate in expert and non-expert forums. Oral presentation	3.61	3.68	0.278 ns	37.771
G15: Critical thinking. Social media analysis.	3.70	3.46	2.745*	37.947

It was observed significant differences in the evaluation of the G15 competence of critical thinking using social media analysis by, i) students and teachers, ii) gender and iii) level of education, Degree or Master. Despite this result could jeopardise the ability of the item social media for the evaluation, the teachers agreed the validity of this social media item due to its ability to discriminate evaluations according to reality.
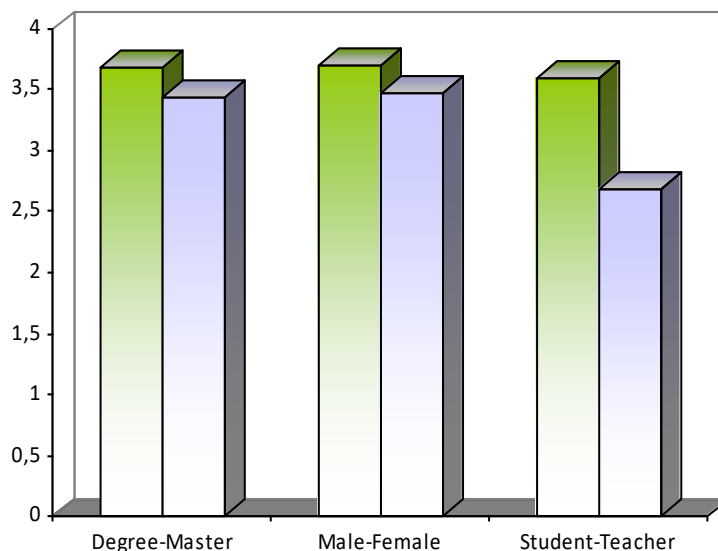

Figure 3. Competence G15 of critical thinking using social media t-Student test analysis.

4   CONCLUSIONS

The teachers' feedback of the use of an activity of social media analysis on the subject practices, reveal a high motivation and appreciation by the students. The students declare that they spent time surfing internet, observing sector companies communication, reading comments and obtaining their own conclusions and critics.

In their comments, the students eulogise their colleagues' work, which help them to learn and progress while seeing the ways to improve their own work observing critically thinking similar others work. It is concluded that activities using social media enhance the G15 competence of critical thinking and improve the students' self-evaluation and evaluation of their own progress.

It is observed significant differences in the evaluation of the competence G15 of critical thinking using social media analysis by students and teachers, gender and the level of education, Degree or Master. Masters' students have a significant higher critical thinking than Degree students. Males give significant higher marks for social media critical thinking than females.

Methodologically, it is proved that CoRubrics is an intuitive digital tool that allows to create the rubric, launch it to students and teachers, data gather from teachers and students, assign a weight to each item and get the weigh averages of the students self-evaluation, teachers-evaluation and students co-evaluation that simplifies the evaluation regarding the use of Rubrics digital tool.

It is proved the ability of rubrics to students self-monitoring their learning process contributing to their teaching responsibility and to self-evaluate their work quality and possible improvement.

Moreover, it is proved the consciousness-raising of the teachers to align the evaluation with the competences to be acquired by the students.

It is proved the rubrics validity to evaluate the learning process aligned with the competences-based learning model.

Finally, it is proved the compliance of rubrics to align the evaluation with the competences that the student needs to acquire during the teaching-learning process.

ACKNOWLEDGEMENTS

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