The use of rubrics to assess distance education courses in a brazilian university

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O uso de rubricas para avaliação de disciplinas à distância em uma universidade brasileira

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El uso de rubricas para evaluación de disciplinas a distancia en una universidad brasileña

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Resumo: Distance education, mediated by Information and Communication Technologies, is increasingly present in the Brazilian educational scenario due to legislation incentives. In this modality, assessment to ensure effective learning, considering the particularities of distance education, represents a challenge to education managers. This research investigates the competences developed in two entirely distance-lectured courses in the Information Management degree of the Federal University of Paraná. For this purpose, the bibliographic and documental methodology was used to construct two assessment rubrics in theCoRubric platform, a data collection instrument for the research. Data are analyzed using statistical techniques. The results show the competences developed by students and those that need improvement, as well as the correlation between the characteristics of the courses and the learning and how much they affect the result. It concludes that the assessment rubrics constructed from CoRubric are capable of generating information for decision making in education.

Palavras-chave: *Distance Education. Higher Education. Learning Assessment. Professional Competence.*

Abstract: *A Educação a Distância mediada pelas Tecnologias da Informação e Comunicação é cada vez mais presente no ensino brasileiro em virtude do incentivo dado pela legislação. A avaliação nessa modalidade representa um desafio aos docentes a fim de garantir a aprendizagem eficaz considerando-se as particularidades da educação a distância. Esta pesquisa investiga as competências desenvolvidas em duas disciplinas totalmente à distância do curso de Gestão da Informação da Universidade Federal do Paraná. Para atender ao objetivo, utiliza metodologia bibliográfica e documental com vistas a construir duas rubricas de avaliação na plataforma CoRubric, o instrumento de coleta de dados da pesquisa. Os dados são analisados por meio de técnicas estatísticas. Os resultados mostram as competências desenvolvidas pelos estudantes e as que precisam de melhorias, bem como a correlação entre características da disciplina e a aprendizagem e o quanto afetam o seu resultado. Conclui que as rubricas construídas a partir da CoRubric são capazes de gerar informações para tomada de decisão na educação.*

Keywords: *Avaliação da Aprendizagem. Competência profissional. Educação a distância. Ensino Superior.*

Resumen: *La Educación a Distancia mediada por lasTecnologías de laInformación y Comunicación es cada vez más presente enlaenseñanzabrasileñaenvirtuddel incentivo dado por lalegislación. La evaluaciónen esta modalidad representa undesafío a los docentes para garantizarelaprendizaje eficaz considerando las particularidades de laeducación a distancia. Esta investigaciónanalizalascompetenciasdesarrolladasendos disciplinas totalmente*

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a distanciadel curso de Gestión de laInformación de laUniversidad Federal de Paraná. Para atender al objetivo, utiliza metodología bibliográfica y documental para laconstrucción de dos rúbricas de evaluaciónenla plataforma Corubric, utilizadas como el instrumento de recolección de datos de lainvestigación. Los datos se analizan mediante técnicas estadísticas. Los resultados muestranlascompetenciasdesarrolladas por losestudiantes y las que necesitanmejoras, así como lacorrelación entre características de la disciplina y elaprendizaje y cuántoafectansu resultado. Concluye que las líneas construidas a partir de la Corubric soncapaces de generarinformaciones para toma de decisiónenlaeducación.

Palabras clave: *Competencia professional. Educación a distancia. Enseñanza superior. EvaluacióndelAprendizaje.*

INTRODUCTION

Competence-oriented education has been a reality in the European Union since the Bologna Declaration was signed by European countries in 1998. The European Higher Education Area (EHEA) has modified the dynamics of universities with the aim of establishing a common educational system, equating diplomas and curricula in the continent (ÁLVAREZ-PÉREZ; LÓPEZ-AGUILAR, 2018).

The Bologna Declaration foresees the development of general and specific competences based on a set of knowledge, skills, and attitudes (GARCÍA; RUBIO; PORTERO, 2018). They are understood as needs arising from a job market that is focused on a society of information and knowledge (MARTINS, 2014).

In Brazil, competence-oriented teaching is done mainly through distance education (EaD), conceptualized as "an educational modality in which the didactic-pedagogical mediation in teaching-learning processes occurs through the use of information and communication technologies" (ALVES; ALVES; VIANA, 2015, p. 16).

The Brazilian legislation that establishes competence-oriented education is Law No. 9394, from December 20, 1996, which establishes the Guidelines and Standards of National Education and encourages the use of EaD in Higher Education Institutions (HEIs). Allied to this law, there is the Administrative Rule No. 1134, from October 10, 2016, which regulates the offer of entirely or partially distance courses in HEIs, as long as a maximum of 20% be respected in this modality.

In support of these guidelines, the Ministry of Education (MEC) has published the Quality Guidelines for Distance Higher Education, which lists recommendations that the evaluations in the Distance Education be predominantly qualitative in order to evaluate the competences developed (BRASIL, 2007).

In this sense, the idea of evaluation by competences in EaD arises and one of the instruments used for this purpose in European countries is the rubric. This type of assessment provides objective criteria based on evidence of learning to evaluate students and their advantage is in the transparency between teacher and students in checking for errors and correctness (CEBRIÁN DE LA SERNA; MOYA, 2014).

The Federal University of Paraná (UFPR) has a partnership with the University ofMálaga (UMA), which enables the sharing of educational technologies such as CoRubric[3], Anotaciones de vídeo, and Webquest. CoRubric is a technological platform for the construction and use of rubrics in a collaborative way. The use of rubrics as an evaluation tool, as well as others of this kind, is provided in the Pedagogical Project of Information Management, one of the degrees offered by the UFPR.

The Federal University of Paraná's Information Management degree was founded in 1998, branching from the Librarianship degree as the job market changed and the lack of professionals capable of dealing with information in different media was brought to attention. Its objective is to "(…) train professionals with skills, notions, and techniques aimed at solving information problems (…)

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3   www.corubric.com

related to the production, collection, organization, dissemination and use of information" (MARCHIORI, 2002, p. 83-84).

The degree presents three pillars: I. information science; II. management; and III. information technology. Because of its general approach, students may choose to take courses in other departments of the university, channeling towards a specific area of knowledge that is of their interest (MARCHIORI, 2002).

Moreover, it was the first degree under such name in Brazil and also pioneer in flexibilization of distance education curricula, splitting into two totally distance courses and the others varying between entirely (100%) or partially (maximum 20%) at distance courses, as provided in the reformulation of the Pedagogical Project in 2013, which was supported by three researchers from the GTEA/UMA (SILVA et al., 2013).

In the discussions on the Pedagogical Project, the need to define the professional profile of the Information Manager emerged, so that the competences were effectively developed throughout the degree, considering that the courses were partially or entirely at distance. However, a discrepancy was noted among the competences established in the literature, the Pedagogical Project and the recommendations for distance education. Therefore, the problem that involves this research is the need to integrate the profile of the Information Manager and the desired competences in EaD, in order to train competent professionals to work in the increasingly competitive labor market.

The objective of this study was to assess by means of two rubrics the competences developed in the following two courses, entirely lectured at distance, from the UFPR Information Management degree: I. Information and Society; and II. Information Technology Management. Herein, the theoretical framework, the methodology used and the conclusions are provided as follows.

2 THEORETICAL FRAMEWORK

Competency is understood as a set of knowledge, skills, and attitudes, capable of explaining a given performance (FLEURY; FLEURY, 2001; CAMARGO, 2013). It may be defined based on two branches: constructivist and behaviorist. The former argues that competences are acquired due to necessity, while the latter states that they are individuals' inherent characteristics (GARIBA JÚNIOR, 2005).

Assuming the constructivist point of view, in which competence is developed in academic or professional circles, distance education allows a different experience than on-site education owing to its unique characteristics such as virtualization of learning, teaching, time and communication flexibility – associated with the use of Information and Communication Technologies (ICTs).

In this sense, it is worth noting that other competences are developed and need to be assessed in this modality of education. Assessment can be understood from three different approaches: diagnostic, formative and summative. The diagnostic one identifies the profile of the student, his/her competences as well as possible learning patterns.

The formative approach verifies mistakes and successes and aims at success by means of feedback. This assessment is conducted throughout the learning process. Finally, the summative verifies the knowledge acquired and measures the level of learning achieved (GARIBA JÚNIOR, 2005). The latter is the most frequent approach in teaching, using quizzes and tests to quantitatively determine the learning rate (BITENCOURT; SEVERO; GALLON, 2013).The competence assessment is formative since it identifies competences acquired and is not restricted to knowledge.

In addition, it verifies the skills and attitudes that the individual has and the ones that he/she needs to develop (PADILHA, 2013). Thus, competence assessment seeks to educate good professionals and properly prepare them for the job market (VELOZO, 2014). There are many instruments for competence assessment including critical incidents, performance measurement scales, behavioral observation scales, self-evaluation, and ru-

brics (CAMARGO, 2013).Rubrics are "quantitative and/or qualitative scales, associated with pre-established criteria that measure the student's actions on the aspects of the task or activity to be assessed" (GORDILLO; RODRÍGUEZ, 2010, p. 142).

The assessment through rubrics verifies mistakes, successes and the range of the objectives proposed (CEBRIÁN DE LA SERNA; MOYA, 2014).Among its advantages, feedback on students' performance and objective learning assessment can be highlighted. In distance education, rubrics are a viable alternative since they are related to tasks, papers and tests, inside or outside the Virtual Learning Environment (VLE).

3 METHODOLOGICAL PROCEDURES

This research followed a mixed approach (qualitative and quantitative in nature), and it was characterized as applied research in relation to its purpose; exploratory and actions research regarding its objectives; and bibliographical and documentary research in terms of the methodological procedures followed (GIL, 2008). Through the bibliographic research, the literature provided the competences rendered by the EaD and the profile of the In-

formation Manager. In the documentary research, the competences foreseen in the Pedagogical Project of the degree were identified.

Based on this information, two rubrics were built on the CoRubric platform, which served as a data collection tool. The participants totaled 204 students from the UFPR Information Management degree. Among them, 202 were enrolled in the university until 2017, and 2 were former students who had taken the courses addressed by this research from 2014.

3.1 CONSTRUCTION AND APPLICATION OF THE RUBRICS

Based on the comparison between the competences of distance education and the ones provided in the Pedagogical Project of the degree and in the literature of the area, two rubrics were constructed: I. learning assessment, and II. course assessment. The competences selected for the rubric "learning assessment" were based on the comparison regarding knowledge, skills, and attitudes identified through bibliographic and documentary research.Skills and attitudes were prioritized, in case the instrument shall be reused in other courses since knowledge is particular to each subject assessed (Table 1).

Table 1- Competences selected from the literature for the rubric "learning assessment"

Competences		EaD	Pedagogical Project	Literature	Rubric
Knowledge	Instruments for management, analysis, dissemination and use of information.		X	X	
	Assessment, management and use of information technology.		X	X	
	Methodologies regarding process efficiency and product assessment.		X	X	
	Provision of information services.		X	X	
	Planning and elaboration of information strategies.		X	X	
	Information planning and management for business.		X	X	
Skills	Analysis and interpretation of information.		X	X	X
	Teamwork.	X	X	X	X
	Problem-solving regarding information flexibility and adaptability.		X	X	X
	Logical reasoning.		X	X	X
	Effective communication.		X	X	X
	Use of ICTs.	X	X	X	X
	Organization.	X		X	X
	Time management.	X		X	X
Attitudes	Responsibility.		X	X	X
	Ethical conduct.		X	X	X
	Continuous learning.	X	X	X	X
	Systemic thinking		X	X	X
	Initiative/Proactivity.		X	X	X
	Creative and investigative character.	X	X	X	X
	Autonomy.	X			X
	Subject.	X			X

Source: Elaborado by the authors (2019).

The competences selected for the "course assessment" rubric were based only on bibliographical research. They include aspects related to the professor's attitude and initiatives, as well as features of the didactic material (Table 2).

Table 2- Competences selected from the literature for the rubric "course assessment"

Criteria	Distance education	Rubric
Discusses the content presented in the program of the degree.	X	X
Provides evaluation criteria for learning.	X	X
Answer to questions within 48 hours.	X	X
Proposes activities to reinforce learning.	X	X
Presents clearly the objective in each unit.		
Provides commented answers to the activities proposed.	X	X
Links thecontentsaddressed.	X	
Details competences, skills and attitudes that the student should achieve by the end of the degree.	X	X
Indicates complementary bibliography and websites.	X	X
Provides an introductory module for mastery of knowledge and skills.	X	X
Uses dialogiclanguage.	X	X
Is pre-assessed, tested and updated aiming at improvement.	X	
Presents balanced ratio among concepts, practical examples and exercises.	X	
Has the necessary density in terms of number of pages, hourly loads and complexity.	X	
Presents peripheral elements (spotlight boxes, trivia, additional information, etc.).	X	X
Features activities that act as self-evaluation for each unit.	X	X

Source: Elaborado by the authors (2019).

The rubrics "course assessment"[4] and "learning assessment"[5] were constructed in the platform CoRubric. A former coordinator of the Information Management degree, a rubric specialist and a distance education specialist validated them. They were applied online to students directly through the platform from September 11, 2017, to September 29, 2017.

The access link was shared via email along with a tutorial. The same tutorial was published in a Google Forms document and shared via Facebook. About 40 students agreed to participate in the research. For the Information and Society course there were 27 students and for the Information Technology Management, 23 students. It should be emphasized that there were students who took both courses and not all of them answered both rubrics for each course.

3.2 DATA TREATMENT AND ANALYSIS

For the analysis of the data of this research, statistical methods were used. These are described in the following analysis protocol (Table 3).

Table 3- Analysis protocol

Procedure	Objective	Theoreticalsupport
Descriptive statistics: mean, standard deviation, mode, minimum and maximum	Describethedataset	Field (2009); Field, Miles e Field (2012); Holcomb (2016)
Shapiro–Wilk (W)	Evaluate the distribution of data	Shapiro e Wilk (1965); Field (2009); Field, Miles e Field (2012)
Bartlett (K²)	Verify the homogeneity of variances	Bartlett (1937)
ANOVA	Verify possible differences between the means of the groups	Field (2009); Field, Miles e Field (2012)
Tukey (Tukey HSD)	Check in which relations reside the differences found	Field (2009); Field, Miles e Field (2012)
Pearson correlationcoefficient (r)	Evaluate the linear relationship of variables in relation to learning	Taylor (1990); Cohen (1992); Field (2009); Field, Miles e Field (2012)
Coefficientdetermination (R²)	Evaluate the ability to explain the adjustment of the model	Taylor (1990); Field (2009); Field, Miles e Field (2012)
F test	Evaluate the quality of the model	Miranda (2008); Hair et al. (2014); Field (2009); Field, Miles e Field (2012)
t test	Evaluate the quality of the coefficients	Field (2009); Field, Miles e Field (2012); Hair et al. (2014)

Source: Elaborado by the authors (2019).

The analyses were developed with the help of R 3.5.1, RStudio 1.1.456 and Microsoft® Excel 2016 tools. When necessary, a 95% confidence level was adopted.

4 RESULTS AND DISCUSSION

In this section we present the results obtained with the application of the analysis protocol mentioned for the two courses evaluated: Information and Society (IS) and Information Technology Management (ITM).

4.1 INFORMATION AND SOCIETY (IS)

From Pearson's correlation test, in which the learning mean of the participants was related to each one of the competences provided

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4   https://corubric.com/index.php?r=public-rubric%2Fview&id=3095
5   https://corubric.com/index.php?r=public-rubric%2Fview&id=3094

in the rubric "course assessment", the following characteristics were identified as being related to learning: a) "answer to questions" (r = 0.5908) and R² of 0.3490; and b) "objective in relation to competences" (r = 0.6277) and R² of 0.3940. These two correlations are presented as moderate (TAYLOR, 1990), establishing a relationship that is directly proportional to learning.

According to the results, the competence "answer to questions" is responsible for 34.90% of the variability found in learning and, in turn, the competence "objective in relation to competences" contributes with 39.40%

of the present learning variation. In terms of effects, these two relations are not negligible, since they present values for Pearson's coefficient higher than 0.50, which indicates that the effect of these competences in relation to learning in this model is high (COHEN, 1992).

In search of a model capable of representing the learning observed in the course, a multiple regression was elaborated with the competences "answers to questions" and "objective in relation to competences" as independent variables, and the variable "learning" as a dependent one. The results are shown in Table 4.

Table 4- Multiple regression of IS learning

	Estimatedvalue	Default error	t	p-valor
Intercept	32.3333	10.4260	3.1001	0.0127
Answertoquestions	0.2308	0.1879	1.2280	0.2505
Objective in relation to competences	0.1974	0.1305	1.5120	0.1648

Source: Elaborado by the authors (2019).

The results listed in Table 4 are non-significant (F (2.9) = 4.17, p-value < 0.052). In addition, only the value obtained for intercept was reliable (p-value < 0.0127). In this way, a

simple regression was chosen, eliminating the competence "answer to questions" due to its p-value. The results of this simple regression are presented in Table 5.

Table 5- Simple regression of IS learning

	Estimatedvalue	Default error	t	p-valor
Intercept	40.0251	8.5447	4.6840	0.0080
Objective in relation to competences	0.2356	0.1119	2.5500	0.0288

Source: Elaborado by the authors (2019).

The results listed in Table 5 are significant (F (1.10) = 6.502, p-value < 0.0280) and the coefficients obtained for the "intercept" (40.0251; p-valor < 0.0080) and

"objective in relation to competences" (0.2356; p-value < 0.0288) are reliable. The equation representing these results is the one that follows:

learning = 40.0251 + 0.2356 x abjective in relatian ta campet   (1)

This simple regression is able to explain 33.34% of the learning in the studied sample. Therefore, it is noted that the definition of learning objectives for students has the potential of improving learning.

4.1.1 RUBRIC "LEARNING ASSESSMENT" (INFORMATION AND SOCIETY)

Regarding the classes, it was verified that in relation to learning for the course of IS, the

highest mean belongs to the class of 2015 (n = 4) (65.67, with a standard deviation of 17.04). The highest value for this class corresponds to 81.67, while the minimum value identified was 48.75. The class of 2014 (n = 7) presented a mean of 54.24, with a standard deviation of 20.38. The maximum value found in this class was 89.79, and the lowest one was 31.50. On the other hand, the class of 2017 (n = 3) reached the lowest mean among the groups (37.36, with a standard deviation of 22.65), presenting as maximum and minimum values, 60.83 and 15.63, respectively.

When the Shapiro-Wilk test was used to evaluate the distribution of class data, it was found that they did not deviate drastically from a normal distribution: 2014 (W = 0.94733; p-valor < 0.7054); 2015 (W = 0.82986; p-valor < 0.1674); 2017 (W = 0.99561; p-valor < 0.8733).In addition, the variances presented in the groups can be considered homogeneous (K² (2) = 0.1827; p--value < 0.9127). Thus, the ANOVA test was used to verify possible differences between the means of the classes. Based on the result of this test (F (1.12) = 1.254, p-value < 0.285), it is not possible to state that there are statistically significant differences between them in relation to learning for this course.

In relation to the competences, the mode of the weight obtained by the level of competence was used. In CoRubric the competences have a relative quantitative value associated with each level, which is used to calculate the final mean. Competences whose mode were higher than 50% were selected (Table 6).

Table 6- Most indicated criteria per competence for the rubric "learning assessment"

Competence	Mode	Frequency	Percentage	Levels
Teamwork.	00.00	16	66	4
Use of ICTs.	33.33	13	54	4
Organization, discipline, responsibility and time management.	100.00	13	54	4
Information analysis and interpretation.	100.00	14	58	4
Mathematical, verbal and written logical reasoning.	50.00	14	58	5
Effective communication.	50.00	14	58	3
Information proactivity and problem-solving.	33.33	13	54	4

Source: Elaborado by the authors (2019).

The competences that did not reach the ideal level were "teamwork", "use of ICTs", "effective communication" and "information proactivity and problem-solving". Some competences were not superior to 50% due to a lack of consensus among the participants and, therefore, are not present in Table 6 ("continuous learning", "critical and investigative character" and "ethical conduct").

The "mathematical, verbal and written logical reasoning" competence did not reach the ideal level, but the participants indicated that they had indeed developed verbal and written logical reasoning, which corresponds to the objective of the course. The other competences achieved the ideal level.

4.1.2 RUBRIC "COURSE ASSESSMENT" (INFORMATION AND SOCIETY)

Regarding the classes, and in relation to the evaluation of the course, it was verified that the highest mean belongs to the class of 2015 (n = 4) (66.67, with a standard deviation of 9.81). The highest value corresponds to 76.66, while the minimum identified was 56.66.

The class of 2014 (n = 7) had a mean of 59.28, with a standard deviation of 15.74. The maximum value found was 90.00, and the lowest one was 41.66. On the other hand, the class of 2017 (n = 3) reached the lowest mean among the groups (23.33, with a standard deviation of 23.33), presenting as maxi-

mum and minimum values, 46.66 and 0.00, respectively.

When the Shapiro-Wilk test was used to evaluate the distribution of the data, it was found that they did not deviate drastically from a normal distribution: 2014 (W = 0.89912; p-valor < 0.3257); 2015 (W = 0.88207; p-valor < 0.3476); 2017 (W = 1; p-valor < 1). In addition, the variances presented in the groups can be considered homogeneous (K^2 (2) = 1.5695, p-value < 0.4562).

Thus, the ANOVA test was used to verify possible differences between the means of the classes studied. Based on the result of this test (F (2, 12) = 7.019; p-value < 0.0108), it is possible to affirm that there are statistically significant differences between the means of the classes with regard to the evaluation of the course.

In order to identify in which relations these differences reside, the Tukey test (Tukey HSD) was applied. The differences were found in the comparison of the class of 2017 with the class of 2015 (p-value < 0.0123) and 2014 (p-value < 0.0202). Between 2014 and 2015, it is not possible to state that there is a statistically significant difference between the means (p-value < 0.7516). Competency analysis indicated that "assessment criteria", "reinforcement activities", "commented responses" and "self-assessment" did not reach ideal levels (Table 7).

Table 7- Most indicated criteria per competence for the rubric "course assessment"

Competences	Mode	Frequency	Percentage	Levels
Assessment criteria.	66.67	6	54	4
Enhancement activities.	33.33	6	54	4
Resources planning.	100.00	7	63	3
Competency goals.	100.00	6	54	2
Commented answers.	00.00	6	54	3
Additional bibliography and websites.	100.00	7	63	3
Language.	100.00	6	54	3
Self-evaluation.	00.00	8	72	3

Source: Elaborado by the authors (2019).

There was no consensus regarding "answer to questions", "resources availability", "content", "introductory module" and "peripheral elements" as most indicated criteria. Moreover, the sections that were improved are "resources planning", "competency goals", "additional bibliography and websites" and "language".

4.2 INFORMATION TECHNOLOGY MANAGEMENT (ITM)

From the Pearson's correlation test, in which the participants' learning mean was related to each of the competences provided in the "course assessment" rubric, the following characteristics were identified as being related to learning: a) "enhancement activities" (r = 0.5064) and R^2 of 0.2564; b) "resources availability" (r = 0.5422) and R^2 of 0.2940; and c) "introductory module" (r = 0.5120) and R^2 of 0.2621.

These three correlations are presented as moderate (TAYLOR, 1990), establishing a relationship that is directly proportional to learning. The competence "enhancement activities" is responsible for 25.64% of the variability found in learning while the "resources availability" competence contributes with 29.40% of the present learning variation. Moreover, the competence "introductory module" corresponds to 26.21% of the learning variation.

In relation to the effects, these three correlations are not negligible, since they present values for the Pearson's coefficient higher than 0.50, indicating that the effect of these competences in relation to the learning is high (COHEN, 1992; FIELD, 2009).In search of an equation capable of representing the learning observed in the course, a multiple regression was elaborated with these three competences as independent variables and the "learning" variable as a dependent one. The results are shown in Table 8.

Table 8- Multiple regression of the ITM course

	Estimatedvalue	Default error	t	p-valor
Intercept	46.2214	8.2345	5.6130	0.0000
Enhancementactivities	0.2859	0.0968	2.9530	0.0161
Resourcesavailability	-0.1824	0.2092	-0.8720	0.4060
Introductory module	0.3525	0.1569	2.2470	0.0512

Source: Elaborado by the authors (2019).

The results listed in Table 8 proved to be significant (F (3.9) = 5.561, p-value < 0.019). However, attention is drawn to the fact that the coefficient for the competence "Resources availability" is not reliable (p-value < 0.4060). Thus, a new regression was chosen, without the presence of this one. The results are presented in Table 9.

Table 9- Multiple regression without the "material availability"

	Estimatedvalue	Default error	t	p-valor
Intercept	45.0060	8.0170	5.6130	0.0000
Enhancementactivities	0.2356	0.0076	3.0690	0.0118
Introductory module	0.2330	0.0753	3.0930	0.0113

Source: Elaborado by the authors (2019).

It is observed that the results listed in Table 9 are significant (F (2.10) = 8.157; p-value < 0.007) and that the coefficients obtained for the "intercept" (45.0060; p-valor < 0.000), "enhancement activities" (0.2356; p-value < 0.0118) and "introductory module" (0.2330;p-value < 0.0113) are reliable. Equation 2 represents these results.

learning = 45.0060 + 0.2356 x anhancement activities + 0.2330 x intraductary madule (2)

This regression explains 54.40% of the learning in the studied sample. From this result, we see that the enhancement activities and the introductory module variables together are able to explain more than half of the learning in the course.

4.2.1 RUBRIC "LEARNING ASSESSMENT" (INFORMATION TECHNOLOGY MANAGEMENT)

Regarding the classes, the highest mean belongs to the class of 2013 (n = 5) (88.25, with a standard deviation of 10.83). The highest value corresponds to 100.00, while the minimum value identified was 75.21.

The class of 2014 (n = 7) had a mean of 78.06, with a standard deviation of 18.06. The maximum value found was 100.00, and the lowest value was 56.80. In turn, the class of 2015 (n = 3), presented the lowest mean (70.83 with standard deviation of 9.27). The maximum and minimum values were 80.83 and 62.50, respectively.

When the Shapiro-Wilk test was used to evaluate the distribution of the data, it was found that they did not deviate drastically from a normal distribution: 2013 (W = 0.91614; p-valor < 0.5054); 2014 (W = 0.86495; p-valor < 0.1676); 2015 (W = 0.97589; p-valor < 0.7023). In addition, it was identified that the variances presented in the classes can be considered homogeneous (K^2 (2) = 1.6133; p-value < 0.4464). Thus, the ANOVA test was used to verify possible differences between the means of the studied classes.

Based on the result of this test (F (1.13) = 3.045, p-value < 0.105), it is not possible to state that there are statistically significant differences between the means of the studied classes regarding learning for this course. The skills that were identified by more than 50% of respondents were: "Information analysis and interpretation", "systemic thinking" and "Information proactivity and problem-solving". The others reached a value close to the ideal one (Table 10).

Table 10- Most indicated criteria per competence for the rubric "learning assessment"

Competence	Mode	Frequency	Percentage	Levels
Teamwork.	66.67	13	65	4
Use of ICTs.	66.67	11	55	4
Continuous learning.	66.67	11	55	4
Effective communication.	50.00	12	60	3
Information analysis and interpretation.	100.00	13	65	4
Systemic thinking.	100.00	13	65	5
Information proactivity and problem-solving.	100.00	11	55	4

Source: Elaborado by the authors (2019).Source: Elaborado by the authors (2019).

The competences that were identified as in the ideal level by more than 50% of the participants were "information analysis and interpretation", "systemic thinking" and "information proactivity and problem-solving". The other competences reached a value close to the ideal one.There were no consensus regarding the "critical and investigative character", "mathematical, verbal and written logical reasoning", "ethical conduct", "organization, discipline, responsibility and time management" and "autonomy" competences.

4.2.2 RUBRIC "COURSE ASSESSMENT" (INFORMATION TECHNOLOGY MANAGEMENT)

In regards to the classes, the highest mean belongs to the class of 2014 (n = 7) (85.59, with a standard deviation of 12.04), in terms of the course evaluation. The highest value corresponds to 100.00, while the minimum was 70.00. The class of 2013 (n = 5) had a mean of 84.00, with a standard deviation of 17.54. The maximum value found was 100.00, and the lowest was 56.66.

On the other hand, the class of 2015 (n = 3) reached the lowest mean among the groups (72.22, with a standard deviation of 12.61), having presented 86.66 and 63.33 as maximum and minimum values, respectively. When the Shapiro-Wilk test was used to evaluate the distribution of class data, it was found that they did not deviate drastically from a normal distribution: 2013 (W = 0.87514; p-valor < 0.2879); 2014 (W = 0.92027; p-valor < 0.4715); 2015 (W = 0.85465; p-valor < 0.253).

In addition, it was identified that the variances presented in the classes can be considered homogeneous (K² (2) = 0.66532; p-value < 0.717). Thus, the ANOVA test was used to verify possible differences between the means of the studied classes. Based on the result of this test (F (1.13) = 0.953; p-value < 0.347), it is not possible to affirm that there are statistically significant differences between the means of the classes studied regarding the evaluation for this course.

In terms of the competences of the course, the only one not observed by more than 50% of the respondents was "self-assessment". The others reached the desired ideal level for EaD subjects (Table 11).

Table 11- Most indicated criteria per competence for the rubric "course assessment"

Competence	Mode	Frequency	Percentage	Levels
Answer to questions.	100.00	11	68	4
Resources planning.	100.00	15	93	3
Content.	100.00	14	87	3
Competency goals.	100.00	13	81	2
Additional bibliography and websites.	100.00	15	93	3
Language.	100.00	14	87	3
Peripheral elements.	100.00	13	81	3
Self-evaluation.	00.00	10	62	3

Source: Elaborado by the authors (2019).

Regarding the competences of the course, the only one that was not indicated by more than 50% of the participants was "self-evaluation". The others reached the ideal level for distance education courses. No consensus was obtained among the participants for the "assessment criteria", "enhancement activities", "resources availability", "commented answers" and "introductory module" competences.

5 FINAL CONSIDERATIONS

The objective of this study was to evaluate, by means of rubrics, the competences developed in two at a distance course from the Information Management degree of UFPR. For that, two rubrics were developed: one to evaluate the learning itself and another to evaluate the course, considering the didactic material and the teacher's attitude.

The CoRubric platform, on which they were built, is a tool capable of providing qualitative and quantitative data, which allows an in-depth analysis of the learning taking place, generating insights for further studies on this topic.

With the statistical methods applied, it was possible to diagnose the situation of each of the courses in relation to the development of the competences that were expected in the EaD, as well as the skills and attitudes of the Information Manager according to the literature.

Although the data presented moderate correlation and regression results for the ex-planation of learning from the characteristics of the teaching material and the teacher's attitude, some of them showed the potential for future studies that involve competency-based evaluation by rubric.

One of the limitations of this research was the difficulty in getting students to participate because they had never used the CoRubric platform before, even with a supporting tutorial. In addition, because there were two rubrics, the instrument was extensive. It is important to emphasize that this is a pilot study and that new applications of the method are necessary to reach conclusive results.

Nevertheless, the use of rubrics through the CoRubric platform to assess learning, whether in a face-to-face or in a virtual environment, is valid as a transparent and accessible way of competency-based assessment and, at the same time, provide data for the decision-making of teachers in relation to their courses.

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