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Methodologies used by university lecturers in teaching and assessment of reading competence

Metodologías utilizadas por los profesores universitarios en la docencia y evaluación de la comprensión lectora

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Abstract

During the last years, in Higher Education, diverse approaches, models, strategies, techniques and methodologies have been implemented, but what is known about their effectiveness for the incorporation of the generic reading comprehension competence in the study plans from university institutions? To answer this research question, this descriptive study is proposed. This materialises in the design and application of an *ad hoc* online questionnaire to evaluate the CLA in Higher Education, to an accessible sample of 280 teachers from a Caribbean Cost Latin American University. All this, through the analysis of teaching, assessment, and usefulness, in addition to the knowledge and interest in generic skills.In this sense, the analyses carried out show statistically significant differential patterns in the use of the available instructional strategies, the techniques, the employed means and the existing web tools to guarantee the optimisation of the reading comprehension competence depending on the department they belong to. Implications for improving teaching and assessment are discussed, as well as limitations and future prospects.

Resumen

Durante los últimos años, en la Educación Superior se siguen empleando enfoques, modelos, estrategias, técnicas y metodologías diversas, pero ¿qué se sabe acerca de la efectividad de esta**s** para la incorporación de la competencia genérica de comprensión lectora avanzada (CLA) en los planes de estudios de las instituciones universitarias? Para dar respuesta a esta pregunta de investigación se plantea el presente estudio de carácter descriptivo. Este se materializa en el diseño y la aplicación de un cuestionario *ad hoc online* para evaluar la CLA en Educación Superior, a una muestra accesible de 280 docentes de una universidad latinoamericana de la costa Caribe. Todo ello, mediante el análisis de la enseñanza, evaluación, y utilidad, además del conocimiento e interés en las competencias genéricas. En este sentido, los análisis realizados evidencian patrones diferenciales estadísticamente significativos en el uso de las estrategias instruccionales disponibles, de las técnicas, de los medios empleados y de las herramientas web existentes para garantizar la optimización de la CLA en función del departamento al que están adscritos. Se discuten las implicaciones para la mejora de la enseñanza y evaluación, así como las limitaciones y perspectivas futuras.

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Introduction

In the last decade, interest in generic communicative competence, especially in advanced reading comprehension (hereinafter, ARC), also known as critical reading (Valero, Vázquez & Cassany, 2015) or academic reading (Muñoz, Valenzuela, Avendaño & Núñez, 2016), has experienced a considerable growth among higher education researchers focusing on standardising and homologating the Higher Education Area (CEEDAR, 2020); CUC, 2018; Jiménez, González & Tornel, 2020; Reyes, Díaz, Pérez, Marchena & Sosa, 2020; Valero et al., 2015). This aspect has been enshrined in recent reforms of national education systems in Europe or Latin America (OECD, 2016), in which generic competences are an essential part of all subjects in the various curricula (CEEDAR, 2020). All of this is based on the standards of the Organisation for Economic Co-operation and Development (OECD, 2016), given that it goes beyond the mere conceptualisation of competences (García-Llamas & Quintanal, 2014). The foregoing fosters full personal and professional development that allows for successful adjustment to the continuous transformations of current learning situations that have led to the implementation of active and innovative teaching methodologies at all educational levels (Muntaner, Pinya, & Mut, 2020) such as problem-based learning (Jiménez et al., 2020; Pacheco, García and García-Martín, 2011), cooperative work (Jiménez et al., 2020), gamification (García-Martín & García, 2018), and the use of specific tools for self-regulation (van Ockenburg, Daphne van Weijen & Rijlaarsdam, 2019) and self-assessment (Cosi et al., 2020). All of the above has been linked to meta-learning (Rocosa, Sangrá & Cabrera, 2018) and lifelong learning (García-Martín & García, 2018; Quendler & Lamb, 2016; Steffens, 2015), which in turn have given rise to the proliferation and development of a large number of massive and open online courses - MOOCs (García-Martín & García-Martín, 2019; García-Martín & García, 2015; García-Martín & García, 2018).

However, as stated by Mano y Moro (2009), it should not be forgotten successful competence-based teaching does not depend only on the conceptual and applied command lecturers have of such competences, but also on their ability to assess them through different comprehensive systems are based on practices that work (Reyes et al., 2020; USOE, 2020).

From this perspective, in many Latin American higher education systems, university students are required to pass generic competence tests upon completion of their degrees (Castro & Ruiz, 2019; Cifuentes, Chacón & Fonseca, 2020; Oviedo & Jiménez, 2019). In the case of Colombia, they must pass the Saber Pro test (Calderón, Parra y Piñeros, 2019), which consists of five modules: i) critical reading (CR) - which corresponds to advanced reading comprehension, ii) quantitative reasoning (QR), iii) citizenship skills (CS), iv) written communication (WC) and v) English (E). In this sense, the critical reading module is made up of a total of thirty-five multiple choice questions intended to evaluate the student's advanced reading comprehension by examining his abilities to understand, interpret and evaluate written texts found in everyday life or in non-specialised academic contexts. The result obtained in this module is interpreted according to previously defined and described performance levels (Calderón, Parra & Piñeros, 2019).

For this reason, universities are implementing multifaceted measures for their teaching staff and students to guarantee the mainstreaming of these competences in all the subjects of the various semesters, through the promotion of innovation in assessment systems (Reyes et al., 2020) and in the active teaching methodologies of their university teaching staff (García-Martín et al., 2019; Sánchez et al., 2019). Recent systematic reviews of literacy across the curriculum have identified the key elements regarding what, when and how of this mainstreaming. But they have highlighted the scarcity of inter-

national empirical studies of reference above all (Scott et al., 2018). For example, in the systematic review over a period of fifty years in the USA carried out by Scott et al., (2018), it was concluded that only twenty-nine studies met the criteria of a minimum level of scientific quality following the methodological quality questionnaire (MQQ), and only four of them allowed a certain quantitative approach, evidencing three general categories of perceptions, resistance and experience as synthesis themes to organise the research carried out on the subject. In the same vein, the recent study by Li et al. (2018) conducted over the last twenty years in China, identifies fifty-nine studies, of which only four allowed a quantitative analysis comparing effect sizes. These studies showed that self-efficacy, task strategies and self-assessment were key aspects for successful self-regulated learning. Furthermore, European studies such as that conducted by Uttl et al. (2017) emphasise the assessments of lecturers' perceptions of their degree of satisfaction with the assessment systems (Reyes et al., 2020), the methodologies used (Jiménez et al., 2020; Sánchez et al., 2019), the critical reading strategies (Valero et al., 2015) and the narrative techniques used (Del Moral-Pérez, Villalustre & Neira, 2016). They suffer from important biases such as -for example- the existence of statistically significant differences in studies with small samples, but such differences are not found when dealing with larger samples.

In this context, the following research question is specified: what are the teaching methodologies implemented by university lecturers is related to the mainstreaming of the generic ARC competence and how is ARC linked to a range of teaching variables?

Method

Objectives

The following objectives have been set in line with the research question: (i) identifying the teaching methodologies commonly used in Colombian universities for the mainstreaming of ARC in different subjects and (ii) studying the link between ARC and a range of teaching variables.

Population and sample

In this study, 280 lecturers from a Latin American university on the Caribbean coast participated voluntarily and gave their informed consent thereto. This made it possible to check the demographic information provided. This study was also authorised by the Ethics Committee. This represents 53% of a total of 525 permanent lecturers (n = 300 full-time and n = 204 part-time), with 40% (n = 210) coming from other countries (Argentina, Brazil, Chile, Costa Rica, Cuba, France, Italy, Mexico, Panama, Peru, Puerto Rico, Romania, Russia, Spain, UK, USA, Venezuela), in addition to another 204 non-permanent lecturers hired for specific periods or tasks (CUC, 2018). However, complete survey responses amounted to 203 (125 men and 78 women), their ages ranging from 24 to 73 (M = 40, SD = 12), representing 39% of the study population (see table 1).

Through simple random sampling of these participants, a level of confidence greater than 99% and a margin of error below 1% are guaranteed. This ensures that the diversity and representativeness of the sample is captured with respect to the population of is lecturers at the institution, which, by including such a marked international origin, makes it comparable -in terms of representativeness- to other Latin American Colombian universities with high quality accreditation, such as the focus of this study.

Non-university teaching experience was *M* = 4 years and *SD* = 6.7 years; being between min-max = 1-30 years. University teaching experience was *M* = 9 years and *SD* = 8.5 years, between min-max = 1-40 years. The standard subjects they refer to as a focus for analysing the

Table 1
Participants' description

Gender / Department	***INFO***	***ECON***	***EXAC***	***AMBI***	***DERE***	***ENER***	***INDUS***	***HUMA***	***Gender Totals***
Men	11	14	24	12	25	18	14	7	125
Women	5	13	9	10	11	7	12	11	78
Department Totals	16	27	33	22	36	25	26	18	203

Note 1. Acronyms refer to the university departments to which the lecturers belong. INFO Computer Science; ECON Economics; EXAC Exact Sciences; AMBI Environmental Sciences; DERE Law; ENER Energy; INDUS Industry; HUMA Humanities.

teaching and assessment of the generic competence of advanced reading comprehension (n = 177) are very diverse and representative of all grades, departments and levels; covering the whole spectrum of areas and fields.

Instrument

Three subscales of the *ad hoc* online questionnaire Assessment and Methodologies and Impact on Generic Competences (EMICOG, as per its Spanish acronym) are used: General and Demographic Data (DGD, as per its Spanish acronym), Knowledge and Interest (CON-INT, as per its Spanish acronym) and Teaching Techniques and Strategies in Advanced Reading Comprehension (TEI - CLA, as per its Spanish acronym). They were designed and implemented through the SurveyMonkey professional survey platform, based on an exhaustive international review of studies and common instruments used in the field, in addition to the review of the construct and empirical research on advanced reading comprehension from a psycholinguistic perspective. Experts in the field were sent out according to the Delphi method, in order to check functionality, operability, as well as to eliminate any potential inconveniences and difficulties that could arise from the interpretation of the items. After modifying all ambiguous items, establishing several versions of the instrument and testing them with pilot samples, the final version was defined by consensus. That Version was sent to the population to be studied.

The EMICOG validation data, carried out with SPSS v26 under licence from the University of León, show adequate psychometric properties, particularly in terms of CON-INT and TEI-ARC. In this regard, internal consistency of the scale elements indicated Cronbach alphas for NOC and INT of .94 and .93; and for TEI-LCA of .95 for Processes and Strategies; .96 for Textual Gender; and .88 for implemented Medium. Composite reliabilities (McDonald's omegas) from factor matrices show coefficients above .90 and average variance extracted are above .50 (Hayes & Coutts, 2020). Likewise, the construct validity data, by means of the maximum likelihood and direct oblique rotation method (when interrelation between the factors is found) confirm subscale distribution, with very significant determinants in the Barlett's tests of sphericity (p = .001) and if the construct validity is supported by sampling adequacy scores in Kaiser-Meyer-Olkin tests above .90. In the subscale CON-INT, the explained variance of the two latent variables, i.e., knowledge (NOC) and interest (INT) amounts to 71%. Calculations in Excel are obtained based on the factor pattern matrix for the NOC and INT factors, respectively: a composite reliability (McDonald's omega) of .94 and .91 (it must be

Table 2

Dimensions analysed in the EMICOG online ad hoc questionnaire

Dimension	Elements		Scale	Previous applications and validations
DGD - General and Demographic Data				
Demographic	14			
CON-INT - Knowledge and interest in the generic competence				
Knowledge	8		1-5 - None, little, neither little nor a lot, quite a lot and a lot	(Arias-Gómez et al., 2018; Barnet, 2001; CUC, 2018; Díaz-Flórez, 2018; García-Martín & García, 2017; Gargallo et al., 2011; González, & Triviño, 2018; OECD, 2016; Montanares & Junod, 2018)
Interest	4			
TEI-ARC - Teaching Techniques and Strategies in Advanced Reading				
Strategies and processes	6 x 3	TEACHING ASSESSMENT USEFULNESS	1-5 - Never, almost never, sometimes, almost always and always	(Calderón et al., 2019; De la Paz et al., 2016; Halamish, 2018; Graham et al., 2018a; 2018b; OECD, 2016; Valero et al., 2015)
Text genres	7 x 3	TEACHING ASSESSING USEFULNESS	1-5 - Never, almost never, sometimes, almost always and always	
Medium	6 x 3	TEACHING ASSESSING USEFULNESS	1-5 - Never, almost never, sometimes, almost always and always	

Source: Adaptation from García-Martín et al., 2019

greater than .70); an average variance extracted (convergent validity) of .59 and .53 (it must be greater than .50); a discriminant validity (square root of the average variance extracted) of .77 and .73, which are greater than the intercorrelation between the factors or latent variables (-.58). In the TEI-ARC subscale, the explained variance of all three latent variables, Processes, Gender and Means, amounts to 49%. Composite reliabilities (MacDonald's omega) of .92, .93 and .96; average variance extracted (convergent validity) of .55, .57 and .64; and discriminant validity of .74, ,75 and .81, therefore greater than the interrelations between the latent variables or factors (-.073, -.354 and .563). are calculated in Excel and obtained, respectively, based on the factor pattern. This confirms the by internal consistency and composite ones and validity (construct's, convergent, discriminant) of the subscales used and their psychometric appropriateness. Furthermore, content validity is guaranteed by means of thorough analysis of the components of generic competences from psycholinguistic perspectives, as well as by means of revision of previous international studies and constructs used to measure these competences by the Colombian Ministry of Education, through its Saber Pro tests (*cfr.* Calderón et al., 2019).

Therefore, three types of variables are analysed regarding advanced reading comprehension (ARC), i) demographic and general variables, ii) knowledge and interest, and iii) variables specific to the competence under study. The latter encompasses the techniques, strategies and processes involved, the textual genres and the medium used, from three perspectives: a) whether they are commonly implemented for working on or teaching with students, b) for assessment and c) their usefulness in cross teaching and assessment of generic competence (see table 2). The TEI-ARC variables assessed regarding techniques, strategies and processes involved were i) extracting the main ideas, ii) linking ideas to previous knowledge,

iii) drawing conclusions and inferences, iv) implementing solutions to other aspects, v) explaining the basic contents of the reading and vi) retrieving information. The genres and types of texts analysed in relation to reading comprehension were i) argumentative, ii) comparison and contrast, iii) question-answer essay, admission, answer, scientific, test answers, opinion, iv) analysis, v) literature review, vi) cause-effect, problem-solution, v) definition and vi) review of the state of play. Finally, the implemented media under assessment were i) use of blogs, ii) wikis, iii) digital databases, iv) traditional format, v) digital format and vi) audio books or video documents.

As for the first subscale, DGD, the research is presented, informed consent is recorded and several demographic data are collected such as name, surname, identification number, date of birth, gender, age, years of experience as a non-university lecturer, years of experience as a university lecturer, degree where teaching takes place, semester, faculty, department and employment category at the university studied.

With regard to the second one, CON-INT, data are collected on the degree of knowledge and interest in the competence model, Saber Pro tests on critical reading, assessment of ARC in the subject, the tasks or strategies implemented to favour ARC and the interest in ARC to work on and assess key aspects of the subject. A 5-point Likert scale is used for this purpose (None / Little / Neither little nor a lot / Quite a lot / A lot).

Finally, regarding the third subscale, TEI-ARC, lecturers are asked to state to what extent they have used specific ARC strategies in their subjects, such as extracting the main ideas, linking the contents to previous knowledge, drawing conclusions and non-explicit inferences, and implementing solutions, suggested by readings, to other aspects..., as well as to identify the text genres as argumentative, comparison and contrast, cause-effect, definition, revision of the state of play... and the implemented medium, blogs, wikis, digital databases, traditional format, digital, audiobooks... All the foregoing from three perspectives: work on it, assessment and finally its usefulness by means of the 5-point Likert scale.

Procedure

Previous international research instruments were reviewed and analysed around the dimensions examined in order to give coherence and articulate the variables analysed in the *ad hoc* questionnaire. It was then designed in the online mass survey software, SurveyMonkey, and sent to the teaching staff of Universidad de la Costa by email. After three weeks open, the link was closed and the relevant organised results were downloaded, the relevant codifications were made and the appropriate statistical analyses were carried out, using version 26 of SPPS software which has provided empirical evidence for this study.

In this vein, a descriptive analysis regarding the mean and standard deviation to characterise the participants was firstly carried out. A parametric analysis was then carried out through asymmetry and kurtosis tests that determined that the distribution met the assumption of normality. Finally, multivariate analyses are carried out using the General Linear Model (GLM).

Results

First, several general linear models were calculated taking the following faculty demographics as grouping variables: i) gender, ii) faculty, iii) degree and iv) professional category, whilst the rest of the ARC teaching variables examined were taken as dependent, which did not show statistically significant differences. However, when the GLM multivariate contrasts were performed considering the department as the grouping variable and the ARC teaching variables as dependent variables, statistically significant results were found with high effect sizes [λ_{Wilks} = .003; F = 1.277; p = .001; η^2 = .523].

In this sense, on the one hand, as shown in table 3, differential patterns are obtained when analysing the evidence of inter-subject effects. Specifically, with regard to the knowledge and interest in the generic competence to be mainstreamed in their subject, there are only statistically significant differences between departments in the degree of knowledge of cross teaching in ARC in the subject [e.g., $F_{\text{Computer Science}}$= 4.23 versus $F_{\text{Humanities}}$ = 4.06; p = .04], and no statistically significant differences were found in the rest of the variables.

Significant differences are also found when linking ideas from some reading with previous knowledge, either to teach, assess or determine their usefulness in the subscale of the use of ARC teaching techniques, strategies and processes. In particular, when comparing some contrasts, such as to work on [e.g., $F_{\text{Computer Science}}$= 4.31 versus $F_{\text{Humanities}}$= 4.56; p = .01], to assess [e.g., $F_{\text{Computer Science}}$= 4.23 versus $F_{\text{Humanities}}$ = 4.56; p = .01], as well as to be useful [e.g., $F_{\text{Computer Science}}$= 4.46 versus $F_{\text{Humanities}}$= 4.75; p = .01].

Something similar occurs with regard to the text genre of reading of argumentative texts, in some comparisons, both for teaching, assessment or their usefulness. This contrast can be seen in relation to work [e.g., $F_{\text{Computer Science}}$= 3.69 versus $F_{\text{Humanities}}$ = 4.31; p = .01], assessment [e.g., $F_{\text{Computer Science}}$= 3.62 versus $F_{\text{Humanities}}$= 4.25; p = .01], and usefulness [e.g., $F_{\text{Computer Science}}$= 3.77 versus $F_{\text{Humanities}}$= 4.38; p = .00]), reading comparison and contrast texts for work [e.g., $F_{\text{Computer Science}}$= 3.38 versus $F_{\text{Humanities}}$= 3.88; p = .04], usefulness [e.g., $F_{\text{Computer Science}}$= 3.62 versus $F_{\text{Humanities}}$= 4.06; p = .01], reading essays for work [e.g., $F_{\text{Computer Science}}$= 4.00 versus $F_{\text{Humanities}}$= 3.94; p = .05], evaluating [e.g., $F_{\text{Computer Science}}$= 3.92 versus $F_{\text{Humanities}}$= 4.00; p = .01], usefulness [e.g., $F_{\text{Computer Science}}$= 4.08 versus $F_{\text{Humanities}}$= 4.19; p = .04], reading analysis of some text to assess [e.g., $F_{\text{Computer Science}}$= 4.00 versus $F_{\text{Humanities}}$= 3.56; p = .04], usefulness [e.g., $F_{\text{Computer Science}}$= 4.15 versus $F_{\text{Humanities}}$= 4.13; p = .02].

In terms of the means used, they differ significantly in blog reading [e.g., $F_{\text{Computer Science}}$= 3.08 versus $F_{\text{Humanities}}$= 2.88; p = .01] and wikis for work [e.g., $F_{\text{Computer Science}}$= 2.85 versus $F_{\text{Humanities}}$ = 2.50; p = .01], assessment and usefulness, in addition to digital formats for work [e.g., $F_{\text{Computer Science}}$= 3.46 versus $F_{\text{Humanities}}$= 3.37; p = .05] and evaluate subject type [e.g., $F_{\text{Computer Science}}$= 3.46 versus $F_{\text{Humanities}}$= 3.37; p = .01].

On the other hand, in general terms, *post hoc* contrasts show that lecturers make greater use of blogs than wikis. Similarly, with regard to their department, the following trend in frequency of use can be seen: i) those of economics, ii) those of computer science, iii) those of law, iv) those of exact sciences, v) those of humanities, vi) those of energy, vii) those of environmental sciences and viii) those of industry. However, it is interesting to note that it is the economics teaching staff who make the most use of these web 2.0 tools (wikis and blogs) to work and evaluate, and who also perceive a greater degree of usefulness of these tools than the IT teaching staff (see figure 1).

Discussion and conclussions

The results obtained show statistically significant differential patterns in the degree of knowledge of ARC's cross teaching for the benefit of lecturers in the humanities department compared to those in the IT department, but not in the rest of the variables related to interest and knowledge of generic competences.

Likewise, within the framework of ARC strategies and processes, there are differences in the items on linking ideas from some reading with previous knowledge (worked on, assessed, useful), in the text genres (argumentative, comparative and contrasting...) in favour of the teaching staff of the humanities department. In this sense, the difficulties faced by university students when solving typical reading activities have been the backbone of a large number of research works, especially those related to

Table 3

Evidence of lecturers' inter-subject effects on instructional variables in ARC considering the department as a grouping variable

DEPARTMENT	***INFO***	***ECON***	***EXAC***	***AMBI***	***DERE***	***ENER***	***INDUS***	***HUMA***	***F***	***p***	$\eta 2$
CONINT -KNOWLEDGE – INTEREST (Min 1- max 5)											
CON - Please state your level of knowledge …											
On cross teaching of generic competences of critical reading and textual construction in the subject	4.23 (.83)	3.48 (.75)	3.79 (.78)	4.14 (.77)	3.82 (.77)	4.05 (.50)	3.44 (.98)	4.06 (1.00)	2.13	.04	.10
TEI-ARC- ADVANCED READING COMPREHENSION - Have any teaching (or instructional) techniques or strategies been used in this subject of… (Min 1- max 5)											
ARC – STRATEGIES AND PROCESSES											
Please link ideas from some reading with previous knowledge (TEACHING)	4.31 (.63)	4.10 (.77)	3.71 (1.04)	3.93 (1.07)	4.25 (.65)	4.33 (.58)	3.56 (1.20)	4.56 (.51)	2.78	.01	.13
Please link ideas from some reading with previous knowledge (ASSESSMENT)	4.23 (.60)	4.05 (.81)	3.67 (1.05)	4.07 (.92)	4.29 (.66)	4.33 (.58)	3.50 (1.34)	4.56 (.51)	2.91	.01	.14
Please link ideas from some reading with previous knowledge (USEFULNESS)	4.46 (.66)	4.24 (.77)	3.96 (1.00)	4.43 (.65)	4.32 (.61)	4.19 (.68)	3.67 (1.19)	4.75 (.45)	2.71	.01	.13
ARC – TEXT GENRES											
Reading some argumentative text (defend ideas, debate, argue, convince, justify) (TEACHING)	3.69 (.63)	3.43 (1.17)	3.13 (1.12)	4.07 (.83)	4.11 (.99)	3.57 (1.36)	3.39 (1.38)	4.31 (.60)	2.63	.01	.13
Reading some argumentative text (defend ideas, debate, argue, convince, justify) (ASSESSMENT)	3.62 (.65)	3.38 (1.20)	3.17 (1.13)	4.14 (.77)	4.07 (1.05)	3.48 (1.33)	3.28 (1.45)	4.25 (.68)	2.55	.01	.12
Reading some argumentative text (defend ideas, debate, argue, convince, justify) (USEFULNESS)	3.77 (.73)	3.86 (.85)	3.50 (1.18)	4.36 (.75)	4.29 (.81)	3.57 (1.21)	3.22 (1.44)	4.38 (.72)	3.10	.00	.14
Reading some text for comparison and contrast: e.g. two theories, concepts, stories, authors, figures, preferences (TEACHING)	3.38 (.77)	3.29 (1.19)	3.42 (.97)	3.57 (1.02)	4.00 (.90)	3.86 (.96)	3.06 (1.16)	3.88 (.89)	2.05	.04	.10
Reading some text for comparison and contrast: e.g. two theories, concepts, stories, authors, figures, preferences (USEFULNESS)	3.62 (.87)	3.71 (.96)	3.54 (.93)	4.14 (.77)	4.25 (.65)	3.81 (.98)	3.22 (1.22)	4.06 (.93)	2.50	.01	.12
Reading some essay (question-answer, admission, answer, scientific, test answers, opinion) (TEACHING)	4.00 (.58)	3.57 (1.03)	3.33 (.96)	3.79 (.80)	3.86 (1.08)	3.62 (1.12)	2.94 (1.26)	3.94 (.77)	2.01	.05	.10
Reading some essay (question-answer, admission, answer, scientific, test answers, opinion) (ASSESSMENT)	3.92 (.64)	3.48 (1.03)	3.38 (.97)	3.79 (.80)	3.86 (1.08)	3.62 (1.12)	2.72 (1.18)	4.00 (.73)	2.82	.01	.13
Reading some essay (question-answer, admission, answer, scientific, test answers, opinion) (USEFULNESS)	4.08 (.64)	3.76 (.83)	3.50 (1.02)	3.93 (.83)	4.07 (.94)	3.71 (1.19)	3.11 (1.37)	4.19 (.83)	2.11	.04	.10
Reading some analysis text (description, literary analysis, process analysis) (ASSESSMENT)	4.00 (.91)	3.29 (.96)	3.42 (1.18)	3.57 (1.16)	4.04 (.79)	3.95 (.92)	3.11 (1.37)	3.56 (1.26)	2.06	.04	.10

Reading some analysis text (description, literary analysis, process analysis) (USEFULNESS)	4.15 (.90)	3.71 (.90)	3.58 (1.18)	4.00 (.68)	4.14 (.65)	4.05 (.92)	3.06 (1.51)	4.13 (1.09)	2.42	.02	.12
CLA – MEDIUM											
Reading some text in blogs (internet tool) (TEACHING)	3.08 (1.26)	3.29 (1.10)	2.96 (1.12)	2.71 (1.44)	3.04 (1.07)	2.76 (1.14)	1.78 (1.06)	2.88 (1.03)	2.88	.01	.14
Reading some text in blogs (internet tool) (ASSESSMENT)	3.00 (1.29)	3.19 (1.12)	2.87 (1.23)	2.64 (1.45)	2.96 (1.04)	2.71 (1.15)	1.89 (1.18)	2.88 (1.03)	2.37	.02	.11
Reading some text in blogs (internet tool) (USEFULNESS)	3.00 (1.08)	3.67 (.86)	3.00 (1.22)	3.07 (1.39)	3.25 (.89)	2.81 (1.12)	2.22 (1.17)	3.00 (1.10)	2.60	.01	.12
Reading some text in wikis (internet tool) (TEACHING)	2.85 (.99)	2.48 (.93)	2.83 (1.01)	2.36 (1.55)	2.75 (1.18)	2.24 (1.18)	1.61 (1.04)	2.50 (1.03)	2.67	.01	.13
Reading some text in wikis (internet tool) (ASSESSMENT)	2.77 (.83)	2.38 (1.02)	2.83 (1.01)	2.29 (1.54)	2.75 (1.18)	2.24 (1.18)	1.56 (1.04)	2.38 (.89)	2.91	.01	.14
Reading some text in wikis (internet tool) (USEFULNESS)	3.00 (1.16)	2.86 (1.01)	3.00 (.98)	2.86 (1.51)	3.00 (1.02)	2.24 (1.14)	2.11 (1.18)	2.69 (1.20)	2.32	.02	.11
Readings are preferably done in digital format (Word, PDF, eBook, ePub) (TEACHING)	3.46 (.78)	3.43 (1.03)	3.83 (.87)	3.57 (.76)	3.82 (.95)	4.05 (.59)	3.44 (1.20)	3.37 (.89)	2.00	.05	.10
Readings are preferably done in digital format (Word, PDF, eBook, ePub) (ASSESSMENT)	3.46 (.78)	3.38 (1.12)	3.83 (.87)	3.50 (.86)	3.79 (.969	4.00 (.63)	3.33 (1.28)	3.37 (.89)	2.86	.01	.13

Note 2. Only statistically significant variables are included. The acronym INFO refers to the Department of Computer Science, ECON to the Department of Economics, EXAC to the Department of Exact Sciences, AMBI to the Department of Environmental Sciences, DERE to the Department of Law, ENER to the Department of Energy, INDUS to the Department of Industry and HUMA to the Department of Humanities.

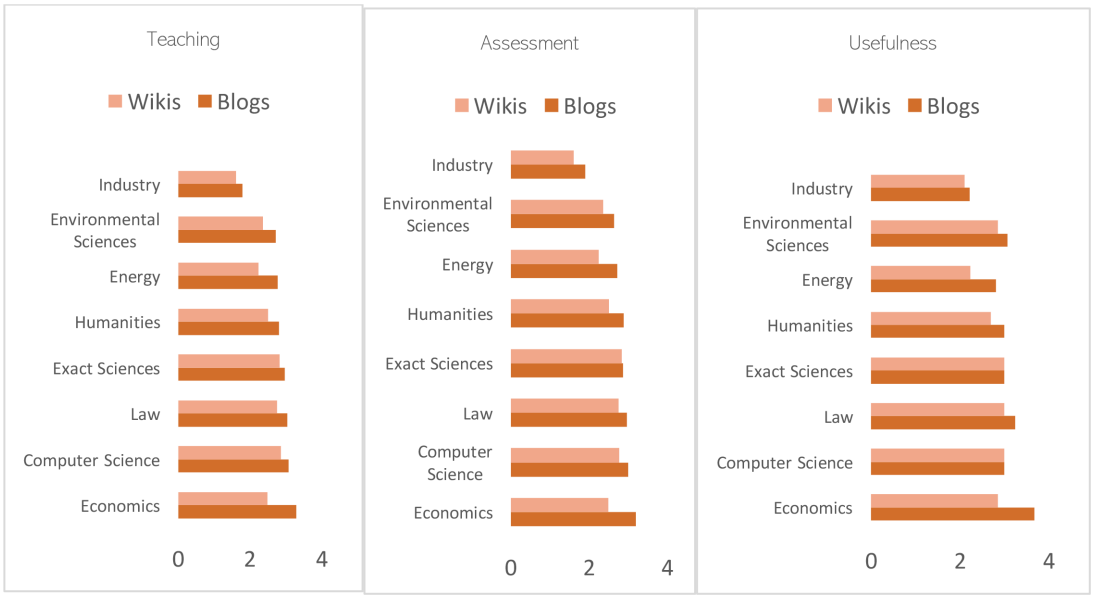

Figure 1. Use of wikis and blogs by lecturers (for teaching and assessment) and usefulness.

the understanding of argumentative discourses (García & Álvarez, 2010). In this line, Nothestein & Valente (2011) showed that the interpretation of this type of texts involves a strong interaction between the text and the reader, hence the importance of teaching design.

However, in the case of the medium used (blogs, wikis and digital format) the opposite trend is found, in favour of computer science lecturers. In this sense, the results described are in line with studies carried out by other researchers such as that conducted by Álvarez and García (2017), aimed at improving reading skills through digital materials, i.e. through the design of a series of activities on the university's Moodle educational platform.

In short, the results show the need to make progress in the search for teaching and learning strategies that are appropriate to the objectives and disciplinary content, as well as to the competences, in order to have a specific impact on the difficulties dealt with and go to the heart thereof. All the foregoing is aimed at offering increasingly effective teaching guides that contribute to improving reading comprehension among students, for which the digital media are presented as great promoters (Álvarez & García, 2017).

However, these results have to be taken cautiously since the response rate was low, as well as the sample's size. Therefore, it would be interesting to replicate this study with even larger samples from several universities, as well as to carry out research focused on promoting training and information of lecturers and students on web resources for the mainstreaming of ARC through the implementation of web tools (Cosí et al., 2020; Del Moral-Pérez et al., 2016) and webinars (Daumiller, Dickhäuser & Dresel, 2019; Hatlevik & Hatlevik, 2018). Additionally, it would be important to examine different strategies for cross assessment and teaching, both virtual and face-to-face (García-Martín & García, 2018; 2020; González & Triviño, 2018; Halamish, 2018). Processes, strategies (Valero et al., 2015) and efficient techniques for retrieving and summarising information should also be analysed, linking ideas and making inferences. Likewise, it would also be interesting to examining the most relevant text genres taking into account the deployed media -whether physical and digital- just like Digital Storytelling (Del Moral-Pérez et al., 2016). Similarly, it would be appropriate to analyse the use of MOOCs (Hew & Cheung, 2014) for the instruction of mainstreaming strategies such as FOCO -Fostering Occupational Competences- (García-Martín & García, 2018) or the gamification of APS-ÉXITO-Psycho-educational Counselling for Success- (García-Martín & García, 2020).

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APPENDIX

Assessment and Methodologies and Impact on Generic Competences (EMICOG)

The subtests used in this study are included:

1. **General and Demographic Data (DGD)**
2. **Knowledge and Interest in Generic Competences (CON-INT)**
3. **Teaching Techniques and Strategies in Advanced Reading Comprehension (TEI-ARC)**

Introduction

This research aims at studying teaching methodologies and forms of assessment or evaluation of cross activities in the subjects, focusing on the generic competences of reading comprehension or critical reading or academic reading, and other learning variables, in order to study current teaching practices as a basis for the design of efficient strategies to improve teaching-learning, which can have an impact on the promotion of greater academic achievement in external tests of generic communicative competences in students (Saber Pro). We therefore ask for your valuable participation in the following survey. The estimated time of effective work to answer the survey properly is 30 minutes. There are no right or wrong answers, only everyday situations and different practices. Best answers honestly reflect your reality and point of view.

Answers are confidential and only treated for overall statistical purposes, in accordance with the ethical and deontological standards applicable to all scientific research.

We thank you for your generous and necessary participation without which this research would not be possible.

Please take your time to answer all the questions and send them to us so that we can count on your effective participation.

Do I confirm that I have been informed and that I wish to participate in the research? Yes / No

1. General and Demographic Data DGD

1- Date of birth 2- Gender 3-Edad
4-Years of experience as a non-university lecturer
5-Years of experience as a university lecturer
6- Year when teaching takes place 7- Semester when teaching takes place
8- Faculty of 9- Department of
10- Current category as University lecturer
11- Do you carry out any professional activity compatible with university teaching?
12- Think about the subjects you teach and point out the one in which you believe more teaching activities related to the use of critical reading are carried out (advanced reading comprehension). Please write it in this space.
13- Think about the subjects you teach and point out the one in which you believe more teaching activities related to the use of critical reading are carried out (advanced reading comprehension). Please write it in this space.
14- Of the subjects listed above, please select the one you are most interested in and you are going to respond to throughout this survey. Please write it in this space.

2. Knowledge and Interest in Generic Competences (CON-INT)

Please state your level of knowledge ...					
1... on the competence model.	None	Little	Neither little nor a lot	Quite	Very much
2... on the Saber Pro tests on critical reading (advanced reading comprehension)	None	Little	Neither little nor a lot	Quite	Very much
3... on the assessment of critical reading (advanced reading comprehension) in the subject.	None	Little	Neither little nor a lot	Quite	Very much
4... on activities or strategies to promote critical reading (advanced reading comprehension) in the subject.	None	Little	Neither little nor a lot	Quite	Very much
5... on cross teaching of generic competences of critical reading (advanced reading comprehension) in the subject	None	Little	Neither little nor a lot	Quite	*Very much*
Please state your level of interest ...					
6... for critical reading (advanced reading comprehension) to work on key aspects of the subject	None	Little	Neither little nor a lot	Quite	Very much
7... for critical reading (advanced reading comprehension) to assess key aspects of the subject	None	Little	Neither little nor a lot	Quite	Very much

3. Teaching Techniques and Strategies in Advanced Reading Comprehension (TEI-ARC)

Strategies and Processes

In this subject, have you ever implemented teaching activities, **techniques, strategies or processes** aimed at...

1...**extracting the main ideas** from some reading...					
a. to **work on / teach / study** one topic	Never	Almost Never	Sometimes	*Almost Always*	Always
b. to evaluate / **assess** learning of part of the subject	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	Always
c. I believe the **usefulness** in this subject is	*Very low*	*Low*	*Neither low nor high*	*High*	*Very high*
2... l**inking ideas** from some reading with previous knowledge...					
a. to **work on / teach / study** one topic	Never	Almost Never	Sometimes	*Almost Always*	Always
b. to evaluate / **assess** learning of part of the subject	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	Always
c. I believe the **usefulness** in this subject is	*Very low*	*Low*	*Neither low nor high*	*High*	*Very high*
3...**drawing conclusions and making inferences** that are not explicit in the readings.....					
a. to **work on / teach / study** one topic	Never	Almost Never	Sometimes	*Almost Always*	Always
b. to evaluate / **assess** learning of part of the subject	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	Always
c. I believe the **usefulness** in this subject is	*Very low*	*Low*	*Neither low nor high*	*High*	*Very high*
4...**implementing solutions** to other aspects, suggested by the readings...					
a. to **work on / teach / study** one topic	Never	Almost Never	Sometimes	*Almost Always*	Always
b. to evaluate / **assess** learning of part of the subject	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	Always
c. I believe the **usefulness** in this subject is	*Very low*	*Low*	*Neither low nor high*	*High*	*Very high*
5...**explaining the main contents** of some reading...					
a. to **work on / teach / study** one topic	Never	Almost Never	Sometimes	*Almost Always*	Always

b. to evaluate / **assess** learning of part of the subject	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	Always
c. I believe the **usefulness** in this subject is	*Very low*	*Low*	*Neither low nor high*	*High*	*Very high*
6...remembering the information read previously without checking (**retrieving**). Check back later and retrieve without checking to complete what is not remembered...					
a. to **work on / teach / study** one topic	Never	Almost Never	Sometimes	Almost Always	Always
b. to evaluate / **assess** learning of part of the subject	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	Always
c. I believe the **usefulness** in this subject is	Very low	Low	Neither low nor high	High	Very high

Text genres

In this subject, have **types of texts** been used in teaching activities, techniques or strategies aimed at reading...?

1... some **argumentative text** (defend ideas, debate, argue, convince, justify)...					
a. to **work on / teach / study** one topic	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	Always
b. to evaluate / **assess** learning of part of the subject	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	Always
c. I believe the **usefulness** in this subject is	*Very low*	*Low*	*Neither low nor high*	*High*	*Very high*
2... some **text for comparison and contrast:** e.g. two theories, concepts, stories, authors, figures, preferences...					
a. to **work on / teach / study** one topic	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	Always
b. to evaluate / **assess** learning of part of the subject	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	Always
c. I believe the **usefulness** in this subject is	*Very low*	*Low*	*Neither low nor high*	*High*	*Very high*
3... some **essay** (question-answer, admission, answer, scientific, test answers, opinion)...					
a. to **work on / teach / study** one topic	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	Always
b. to evaluate / **assess** learning of part of the subject	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	Always
c. I believe the **usefulness** in this subject is	*Very low*	*Low*	*Neither low nor high*	*High*	*Very high*
4... some **analysis** text (description, literary analysis, process analysis)...					
a. to **work on / teach / study** one topic	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	Always
b. to evaluate / **assess** learning of part of the subject	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	Always
c. I believe the **usefulness** in this subject is	*Very low*	*Low*	*Neither low nor high*	*High*	*Very high*
5... some **literature review**...					
a. to **work on / teach / study** one topic	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	Always
b. to evaluate / **assess** learning of part of the subject	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	Always
c. I believe the **usefulness** in this subject is	*Very low*	*Low*	*Neither low nor high*	*High*	*Very high*
6... some **cause-effect / problem-solution text**.....					
a. to **work on / teach / study** one topic	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	Always
b. to evaluate / **assess** learning of part of the subject	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	Always
c. I believe the **usefulness** in this subject is	*Very low*	*Low*	*Neither low nor high*	*High*	*Very high*

7... some **definition** text ...					
a. to **work on / teach / study** one topic	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	Always
b. to evaluate / **assess** learning of part of the subject	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	Always
c. I believe the **usefulness** in this subject is	*Very low*	*Low*	*Neither low nor high*	*High*	*Very high*
8... some text of **revision of the state of play** (of an issue, a theory, an approach, scientific, background, previous experience, successful solutions, good practices) ...					
a. to **work on / teach / study** one topic	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	Always
b. to evaluate / **assess** learning of part of the subject	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	Always
c. I believe the **usefulness** in this subject is	Very low	Low	Neither low nor high	High	Very high

Medium

In order to **implement** the teaching strategies, **we**

1... read some text in **blogs** ...					
a. to **work on / teach / study** one topic	Never	Almost Never	Sometimes	Almost Always	Always
b. to evaluate / **assess** learning of part of the subject	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	Always
c. I believe the **usefulness** in this subject is	*Very low*	*Low*	*Neither low nor high*	*High*	*Very high*
2... read some text in **wikis** ...					
a. to **work on / teach / study** one topic	Never	Almost Never	Sometimes	Almost Always	Always
b. to evaluate / **assess** learning of part of the subject	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	Always
c. I believe the **usefulness** in this subject is	*Very low*	*Low*	*Neither low nor high*	*High*	*Very high*
3... reading some document from **digital databases**...					
a. to **work on / teach / study** one topic	Never	Almost Never	Sometimes	Almost Always	Always
b. to evaluate / **assess** learning of part of the subject	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	Always
c. I believe the **usefulness** in this subject is	*Very low*	*Low*	*Neither low nor high*	*High*	*Very high*
4... readings are preferably done in **traditional format** (paper, notes, articles, books) ...					
a. to **work on / teach / study** one topic	Never	Almost Never	Sometimes	Almost Always	Always
b. to evaluate / **assess** learning of part of the subject	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	Always
c. I believe the **usefulness** in this subject is	*Very low*	*Low*	*Neither low nor high*	*High*	*Very high*
5... readings are preferably done in **digital format** (Word, PDF, eBook, ePub)					
a. to **work on / teach / study** one topic	Never	Almost Never	Sometimes	Almost Always	Always
b. to evaluate / **assess** learning of part of the subject	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	Always
c. I believe the **usefulness** in this subject is	*Very low*	*Low*	*Neither low nor high*	*High*	*Very high*
6... **audio books or video documents**.....					
a. to **work on / teach / study** one topic	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	Always
b. to evaluate / **assess** learning of part of the subject	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	Always
c. I believe the **usefulness** in this subject is	Very low	Low	Neither low nor high	High	Very high