

Academic honesty as a criterion for evaluating the work of university

La honestidad académica como criterio de evaluación de los trabajos del alumnado universitario

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Abstract

The main objective of this work is to know the perception of the undergraduate and master students of the three Galician universities about the plagiarism commission and check the relationship between it and the citation of documentary sources as a criterion for the evaluation of academics works by teachers of the different knowledge areas. The sample is made up of 8.943 students, with an approximate average age of 21 years, approximately 66% of women and from all knowledge areas. To collect the information, the Questionnaire for the Detection of Coincidences in Academic Works (CUDECO) is used. The data indicates that students have a lower predisposition to commit plagiarism in the event that teachers take action on it in the evaluation process. In conclusion, it is possible to establish a greater need for research about the characteristics of evaluation systems and, consequently, also about the characteristics of the teaching-learning process.

Keywords: Ethics; Academic dishonesty; Plagiarism; Higher Education; Learning processes; University students perception; Evaluation processes; Quotes; References; College faculty

Resumen

El principal objetivo de este trabajo es conocer la percepción del alumnado de grado y máster de las tres universidades gallegas sobre la comisión de plagio y comprobar la relación entre ésta y la citación de fuentes documentales como criterio de evaluación de los trabajos académicos por parte del profesorado de las diferentes ramas de conocimiento. La muestra está conformada por 8.943 estudiantes, con una edad media aproximada de 21 años, aproximadamente un 66% de mujeres y de todas las ramas de conocimiento. Para la recogida de la información se emplea el Cuestionario para la Detección de Coincidencias en Trabajos Académicos (CUDECO). Los datos indican que el alumnado tiene una menor predisposición a cometer plagio en el caso de que el profesorado tome medidas sobre ello en el proceso de evaluación. Como conclusión, se puede establecer una mayor necesidad de investigación acerca de las características de los sistemas de evaluación y en consecuencia también de las características del proceso de enseñanza-aprendizaje.

Palabras clave: Ética; deshonestidad académica; Plagio; Educación Superior; Proceso de aprendizaje; Percepción del alumnado universitario; Proceso de evaluación; Citas; Referencias; Profesorado universitario

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Academic dishonesty is a recurrent and widely developed unethical practice in academic work at the university level (Lucía, Fernando, & Castellanos, 2006; Llergo & Alvear, 2020; Martínez-Sala, Alemany-Martínez, & Segarra-Saavedra, 2019; Soto, Hernández, Zamudio, & Torres, 2020).

As part of academic dishonesty, there are publications that suggest that the actions of university teaching staff may influence the commission of plagiarism by students in their academic work. Moreno (1999) indicates that teachers must act in an ethical way to provide an example that will lead students to behave in

the same way, pointing out that the preventive way of plagiarism involves changes in the teaching-learning process (detecting it and educating in its avoidance) but also in the process of evaluating the performance of students, in such a way that it has to minimize the chances of plagiarizing students, leaving no option for this to happen, responding to it in a negative way (Hu & Sun, 2016). There are authors who refer to this as the ethical dimension of evaluation (Cebrián-Robles, Raposo-Rivas, & Duarte-Freitas, 2018).

In this way, Llergo & Alvear (2020) indicate that the teacher must also be willing to modify the way in which he/she presents and qualifies the teaching-learning process, prioritizing originality and effort. Even among teachers themselves, ideas arise as to whether the solution necessarily involves a change in the ways of evaluating (Barberá, 2019).

One of the main lines of research developed in recent focuses on determining the role of teachers in preventing academic dishonesty, warning students of its consequences, providing skills to conduct a self-assessment of their own progress or even creating opportunities to review drafts of their academic work (Zarfsaz & Ahmadi, 2018), which raises the question of whether these aspects are taken into account in the evaluation process.

Some authors indicate that one of the reasons that can contribute to plagiarism by students may be the characteristics of learning assessment methodologies (Casiano, 2020; Fernando & Lucía, 2004; Lucía et al., 2006) understanding that, when it comes to evaluation, the aim is to verify the acquisition of knowledge, skills, by means of tests to assess their degree of achievement. In this line, Casiano (2020) points out that evaluation must offer possibilities to strengthen and consolidate learning, and, therefore, the evaluations that we can consider of an encyclopedic type, have as a drawback the strengthening of academic plagiarism. In this sense, Martínez & Ramírez (2017) point out that the evaluation processes that measure exclusively characteristics related to the memorization process, raise the number of plagiarism carried out. Similarly, Guerrero,

Mercado & Ibarra (2017, p. 10) identify that one of the variables that can show "positive and significant links" with the dishonest academic practices of students, may be the type of evaluation of their teachers; that is, it is a good predictor of the frequency of such frauds (Fernando & Lucía, 2004). Mejía, Pineda, López, Gómez, & Nieves (2019) go so far as to say that students do not commit plagiarism at the time teachers pay attention to it in the evaluation process.

In order to prevent or avoid plagiarism, it is quite common for university institutions to propose control and sanction mechanisms; however, in previous analyses, the causes of plagiarism are not attributed to a lack of knowledge of regulations or to the application of sanctions (Porto-Castro, Espiñeira-Bellón, Losada-Puente, & Gerpe-Pérez, 2019). Therefore, as reflected in the report of Mejía et al. (2019), a "systemic, pedagogical and socio-cultural perspective" should be adopted (p. 199).

In the light of the above, items related to the detection of differences in the evaluation of teachers between plagiarized and non-plagiarized academic works and even between students who have submitted a plagiarized work and those who have not, have gradually been introduced into the instruments of plagiarism (Zarfsaz & Ahmadi, 2018). There are also authors who have created rubrics to evaluate academic writing works combined with anti-plagiarism tools (Razi, 2015).

Numerous causes have been studied that provoke the commission of plagiarism (Porto-Castro, Mosteiro-García, & Gerpe-Pérez, 2019; Rebollo-Quintela, Espiñeira-Bellón, & Muñoz-Cantero, 2017). Academically, the results of previous studies show that students "do not have the habit of making bibliographic citations because teachers do not require it" (Egaña, 2012, p. 25), which has deficiencies in certain fundamental competencies in academic writing (Lafuente, Faura, Puigcerver, Bote, & Martín, 2019) or that considers that there is a need for better and greater accompaniment in the process of writing their academic papers reviewing the ways of evaluating this aspect

(Ochoa & Cueva, 2016). Others indicate that teachers, through their actions, can encourage it (Lucía et al., 2006); these include lack of attention, lack of action or permissiveness, lack of time or competence to determine it (Cebrián, 2019),... ; in short, not to carry out an exhaustive review of the requested works (Sanvicén & Molina, 2015; Zenteno, 2019). In some cases, it is even pointed out that there are no clear rules at the time of evaluation of the papers submitted and that teachers do not provide feedback on the evaluations (Ramírez, 2019). In previous studies, students have emphasized the need to evaluate positively the correct citation of documentary sources incorporated in academic works, as an incentive to differentiate them from students who do not (Muñoz-Cantero, Porto-Castro, Ocampo-Gómez, Espiñeira-Bellón, & Mosteiro-García, 2019).

In the field of research, attempts are made to discriminate prevention techniques, recommending as one of the lines of action "to carry out evaluations to include formative and summative feedback" (Cebrián-Robles, Raposo-Rivas, Cebrián-de-la-Serna, & Sarmiento-Campos, 2018, p. 109), and also "the incorporation into the curricula of the subjects of some evaluation criteria that eliminate, prevent or reduce the score of plagiarized works" (p. 121); thus, López-Gil & Sevillano (2020) point out that there is a need to establish criteria for the evaluation of citations and bibliographic references from documentary sources used in the academic work of students and, in previous publications, the research team of this work, taking into account the perception of the students participating in the reference project, opts for preventive, organizational, coercive and attitudinal measures (Muñoz-Cantero et al., 2019).

Thus, the objective of this paper is to determine whether there are significant relationships between the student plagiarism commission and the teachers' evaluation of the correct citation of the sources incorporated in the academic papers. To this end, the frequency with which university students admit to having committed fraudulent actions in their academic work is established and the potential

relationship between this commission and the perception that university professors introduce as an evaluation criterion the correct citation.

Method

The research, aimed at finding conclusions that could explain the objectives, is framed within a quantitative approach, under a non-experimental design, of descriptive and correlational transectional type, understanding, in line with Martínez (2014) that the variables used are measured at a given and finite time, seeking to study the characteristics of a fact and, trying to analyze the relationship between several variables determined in the research.

Participants

In order to achieve the expected objectives, the student population that is part of the University System of Galicia has been included, since the intention of this study is to analyze the way in which the university students face the academic works, from a point of view of honesty or dishonesty in their realization; therefore, the group or collective involved is the students of Higher Education.

The sample was selected on the basis of an intentional, non-probability and convenience sampling, and several selection criteria were established: for degrees (to have at least one degree per branch of knowledge in two or three of the participating universities, one of which is at least double degree and another own degree representing the different university campuses) and master's degrees (a minimum of one third of those taught at the three universities per branch of knowledge was set).

The data-producing sample, according to Table 1, is made up of 8.943 students studying grade (95.3%) and master (4.7%) at the Universities of Santiago de Compostela (41.3%), Coruña (39.7%) and Vigo (19%) of which 65.7% are women and 33.5% are men, with an average age of approximately 21 years ($M=21.32$; $SD=3.79$).

According to the knowledge branch, slightly more than half of them are studying Social and Legal Sciences (57.1%), 16.6% in Health Sciences, 10.2% in Engineering and

Architecture, 9.2% in Sciences and 6.8% in Arts and Humanities.

Table 1. Sample involved by university and branch of knowledge.

UNIVERSITY	N	BRANCH OF KNOWLEDGE	N
University of Coruña	3515	Arts and Humanities	608
University of Santiago de Compostela	3687	Sciences	826
University of Vigo	1679	Health Sciences	1483
		Social and Legal Sciences	5110
		Engineering and Architecture	916

Measuring instrument

During the academic year 2018/2019, in the framework of the research project funded by the Galician Regional Government (reference 002/2019), called "Study on plagiarism in students of the Galician university system", the Questionnaire for the Detection of Coincidences in Academic Works (CUDECO) was applied (Muñoz-Cantero, Rebollo-Quintela, Mosteiro-García, & Ocampo-Gómez, 2019). This instrument was used to investigate the academic integrity of students in the Galician University System (A Coruña, Santiago de Compostela and Vigo).

This instrument consists of 47 items in Likert scale with seven response alternatives (totally disagreeable / totally agreed) grouped in five dimensions: utility (what use does it have for university students to cite?), career (actions carried out by students throughout their university studies), causes (causes that have motivated university students to carry out previous actions), teaching staff (actions that teachers implement) and colleagues (I think my colleagues have done the following actions); as well as an open question devoted to exploring ways to avoid plagiarism.

The reliability of the instrument through the calculation of the Alfa of Cronbach yields a result for the three universities of .865, being for the students of the University of Santiago de Compostela of .851, for the students of the University of Coruña .868 and for the students of the University of Vigo .877, thus achieving a high reliability in all three cases.

For the purposes of this article, we analyze, on the one hand, the responses of students to the item that allows contextualizing the

performance of teachers with respect to the evaluation of students, which is part of the teaching dimension (P) of the instrument, item 1T, *Teachers evaluate the correct citation of the incorporated documentary sources*.

On the other hand, the responses related to the dishonest practices that students have committed during their university studies are analyzed, seven items focused on the following actions that shape the career dimension (C) of the instrument, or, what is the same, what students agree to do throughout their careers:

- Item 1C: I have delivered some work done by others in previous courses.
- Item 2C: I have copied from web pages fragments of texts and, without quoting, I have incorporated them into the work I had written.
- Item 3C: I have copied fragments from printed sources and, without quoting them, I have incorporated them into my written work.
- Item 4C: I have delivered as my own some complete work downloaded from the Internet, without modifying it.
- Item 5C: I have done some work entirely from fragments literally copied from web pages.
- Item 6C: I have done some work entirely from printed sources, without mentioning the authors.
- Item 7C: I used excerpts from teachers' notes to elaborate some work, without quoting them.

The reliability of the instrument for the identified sample, in the teaching dimension is .807 and in the career dimension is .827.

Process of collection of information

The questionnaire, which was prepared for the optical reading of the replies, was given to students in the lectures during the month of April 2019, during school hours, taking into account the instructions provided by the Ethics Committee for Research and Teaching of the University of Coruña (coordinating university) and by the management team of each centre, seeking to attend lectures with the highest attendance (usually, given the distribution of teaching at Galician universities, during the expository classes). Prior authorization was obtained from each university (from which permission was obtained to enter the centers).

In each classroom, research details were reported on the following issues, according to the document approved by the Ethics Committee: What is the purpose of the research? What does my participation consist of? What are the risks or drawbacks? Will I get any benefit from participating? Will I receive information from the study? Will the results of the study be published?, How will the confidentiality of my data be protected? What will happen to the obtained data? What will happen if there are any negative consequences of participation? Are there economic interests in this study? Who can give me more information?

In addition, information was provided regarding the anonymity of the participating students. The entire process of information, collection, storage and processing of data was approved, also, by the Committee.

Data analysis

The data collected, once read by optical reading, were transformed into a data matrix integrating the results obtained at the three universities and then subjected to statistical processing for analysis, using the statistical package IBM SPSS Statistic in its version 24.0.

In the first place, the frequency of fraudulent actions by university students was observed, calculating the main descriptive statistics of the items corresponding to the career dimension (remember that it refers to actions of plagiarism committed by students throughout university studies), through the calculation of the average, median, fashion and standard deviation of each of the items. The same analysis was carried out to check the frequency with which university teaching staff take it into account as an evaluation criterion.

Subsequently, the fulfilment of the normality assumption was verified through the Kolmogorov-Smirnov test with correction of the significance of Lilliefors (K-S-L). As a result of its application, as shown in Table 2, the normal H_0 in all items in the total sample and by branch of knowledge are rejected since the values obtained are $p < .005$. The calculation also proceeded with the Levene test of homogeneity of variances, resulting in the rejection of the H_0 of equality of variances as the value of the Levene statistic $F=10.983$ and its significance $p < .001$.

Table 2. Kolmogorov-Smirnov Normal Test

	Test of Kolmogorov-Smirnov			
	<i>n</i>	<i>K-S</i>	<i>gl</i>	<i>p</i>
Total sample	8943	.129	8777	.000
Social and Legal Sciences	5110	.137	5005	.000
Arts and Humanities	608	.187	604	.000
Sciences	826	.114	799	.000
Health Sciences	1483	.116	1465	.000
Engineering and Architecture	916	.110	904	.000

Based on these results, non-parametric tests were used for the following calculations. Specifically the Mann-Whitney U-tests and the Kruskal-Wallis H tests to verify the differences

in relation to the plagiarism commission and the teachers' assessment of the correct citation of the sources incorporated in the academic

papers, both for the whole sample and for each branch of knowledge.

To check the relationship between the two variables the Spearman Rho correlation coefficient was used, an alternative test to the Pearson correlation coefficient used with variables whose distribution is not normally distributed (Del Líbano, Ubillos, Puente & Gutiérrez, 2019; Morales, 2008).

Result

The results presented below will answer five questions that will allow us to respond to the objective of the work:

Prevalence of academic plagiarism by university students

As it can be seen from Table 3, there is a tendency to assess negatively the items that refer to students being able to commit plagiarism throughout their careers ($Mo=1$).

Thus, the full copy of academic papers both from printed sources and from internet are uncommon practices among students, *I have*

delivered as own some complete work downloaded from the Internet, without modifying it ($M=1.31$, $SD=1.08$), *I have delivered some work done by others in previous courses* ($M=1.90$, $SD=1.68$), *I have done some work entirely from printed sources, without mentioning the authors* ($M=1.97$, $SD=1.57$) and *I have done some work entirely from fragments literally copied from web pages* ($M=1.99$, $SD=1.60$).

With values close to the average value of the scale the items referring to the copy of fragments of web pages and the notes of the faculty stand out, *I have copied fragments of printed sources (books, newspapers, magazine articles, etc.) and, without quoting them, I have incorporated them into the work I had written* ($M=2.92$, $SD=1.95$), *I have copied from web pages excerpts of text, and without quoting, I have incorporated them into the work I had written* ($M=3.20$, $SD=2.02$) and *I used excerpts from the teachers' notes to elaborate some work, without mentioning them* ($M=3.35$, $SD=2.00$)

Table 3. Descriptive statisticians of the items of the dimension Career

	<i>M</i>	<i>Md</i>	<i>Mo</i>	<i>SD</i>
Item 1C. I have delivered some work done by others in previous courses	1.90	1.00	1	1.68
Item 2C. I have copied text fragments from web pages and, without quoting, I have incorporated them into the work I had written	3.20	3.00	1	2.02
Item 3C. I have copied excerpts from printed sources (books, newspapers, magazine articles, etc.) and, without quoting them, I have incorporated them into my written work	2.92	2.00	1	1.95
Item 4C. I have delivered as own some complete work downloaded from Internet, without modifying it	1.31	1.00	1	1.08
Item 5C. I have done some work entirely from fragments literally copied from web pages	1.99	1.00	1	1.60
Item 6C. I have done some work entirely from printed sources, without mentioning the authors	1.97	1.00	1	1.57
Item 7C. I have used excerpts from teachers' notes to elaborate some work, without mentioning them	3.35	3.00	1	2.00

Note: Values close to average are presented in bold

Prevalence of evaluation of appointments by university faculty

As it can be seen from table 4, there is a tendency to evaluate positively the item referring to teachers applying as a criterion for

evaluation the citation made by students in their academic work ($M=4.51$). It is noteworthy that the value of the median ($Md=5$) indicates that 50% of the values indicated by the students are above 5.

Table 4. Descriptive Statistics of the Dimension Item Teachers

	<i>M</i>	<i>Md</i>	<i>Mo</i>	<i>SD</i>
Item 1T. Teachers evaluate the correct citation of incorporated documentary sources	4.51	5.00	4	1.66

Note: The median value is presented in bold

Prevalence in the commission of academic plagiarism by university students according to the different branches of knowledge

Table 5 shows the commission of plagiarism by students of the five branches of knowledge. In general, the results are very similar both in terms of the mean value of each item and the dispersion of the responses. It is worth mentioning, in the five branches of knowledge, a greater appreciation of the item *I have used fragments of the teachers' notes to elaborate some work, without mentioning them* (Social and Juridical Sciences: $M=3.27$; Arts and Humanities: $M=3.28$; Sciences: $M=3.64$; Health Sciences: $M=3.37$ and Engineering and Architecture: $M=3.55$) and a lower valuation of the item *I have delivered as my own complete work downloaded from the Internet, without modifying it* (Social and Legal Sciences: $M=1.37$; Arts and Humanities: $M=1.24$; Sciences: $M=1.22$; Health Sciences: $M=1.23$ and Engineering and Architecture: $M=1.35$).

The Kruskal-Wallis test, based on the ranges of the scores, was applied to verify the existence of differences depending on the branch of knowledge and that "contrasts the hypothesis that the sum of ranges attributed to the set of observations of each group is statistically equal, and it can then be stated that all samples come from the same population or from similar populations as far as averages are concerned" (Weaver & Etxeberria, 2006, p.386).

With a confidence level of 95% statistically significant differences are obtained between students from different branches of knowledge in all the items *I have delivered some work done by others in previous courses* ($\chi^2=78.867$; $p<.001$), *I copied from web pages excerpts of*

text and, without quoting, I incorporated them into the work I had written ($\chi^2=144.784$; $p<.001$), *I have copied excerpts from printed sources (books, newspapers, magazine articles, etc.) and, without quoting them, I have incorporated them into the work I had written* ($\chi^2=113.645$; $p.001$), *I have delivered as my own some complete work downloaded from the Internet, without modifying it* ($\chi^2=40.054$; $p.001$), *I have done entirely some work from fragments literally copied from web pages* ($\chi^2=92.349$; $p.001$), *I have done entirely some work from printed sources, without mentioning the authors* ($\chi^2=59.147$; $p.001$) and *I used excerpts from the teachers' notes to elaborate some work, without mentioning them* ($\chi^2=35.775$; $p<.001$).

The branches of knowledge in which these differences occur, the result of the peer-to-peer analysis of the different comparison groups, through the Mann-Whitney U-test, show in the first place, that the students of Health Sciences value significantly higher than the Social and Legal Sciences the items *I have copied from web pages text fragments and, without quoting, I incorporated them into the work I had written* ($U=1172.500$; $p=.004$) and *I have copied excerpts from printed sources (books, newspapers, magazine articles, etc.) and, without quoting them, I have incorporated them into the work I had written* ($U=1131.080$; $p=.002$), being conversely in the item *I have delivered as my own some complete work downloaded from the Internet, unchanged* ($U=1325.500$; $p=.002$) where students of Social and Legal Sciences get the highest marks.

Table 5. Descriptive statisticians of dimension items Degree by branch of knowledge

Items Degree	dimension	Social and Legal Sciences	Arts and Humanities	Science	Health Sciences	Engineering and architecture
Item 1C	<i>n</i>	5110	608	826	1483	916
	<i>M</i>	1.91	1.50	1.81	1.94	2.07
	<i>Md</i>	1.00	1.00	1.00	1.00	1.00
	<i>Mo</i>	1	1	1	1	1
	<i>SD</i>	1.69	1.38	1.59	1.72	1.77
Item 2C	<i>n</i>	5110	608	826	1483	916
	<i>M</i>	3.18	2.47	3.07	3.37	3.60
	<i>Md</i>	3.00	2.00	1.00	3.00	3.00
	<i>Mo</i>	1	1	1	1	1
	<i>SD</i>	2.00	1.87	2.02	2.06	2.04
Item 3C	<i>n</i>	5110	608	826	1483	916
	<i>M</i>	2.92	2.24	2.84	3.08	3.14
	<i>Md</i>	2.00	1.00	3.00	2.00	3.00
	<i>Mo</i>	1	1	1	1	1
	<i>SD</i>	1.93	1.77	1.92	2.04	1.97
Item 4C	<i>n</i>	5110	608	826	1483	916
	<i>M</i>	1.37	1.24	1.22	1.23	1.35
	<i>Md</i>	1.00	1.00	2.00	1.00	1.00
	<i>Mo</i>	1	1	1	1	1
	<i>SD</i>	1.15	1.04	.84	.91	1.09
Item 5C	<i>n</i>	5110	608	826	1483	916
	<i>M</i>	2.00	1.62	1.82	2.01	2.27
	<i>Md</i>	1.00	1.00	1.00	1.00	1.00
	<i>Mo</i>	1	1	1	1	1
	<i>SD</i>	1.60	1.34	1.43	1.62	1.72
Item 6C	<i>n</i>	5110	608	826	1483	916
	<i>M</i>	2.00	1.63	1.84	1.96	2.14
	<i>Md</i>	1.00	1.00	1.00	1.00	3.50
	<i>Mo</i>	1	1	1	1	1
	<i>SD</i>	1.58	1.34	1.48	1.58	1.70
Item 7C	<i>n</i>	5110	608	826	1483	916
	<i>M</i>	3.27	3.28	3.64	3.37	3.55
	<i>Md</i>	3.00	3.00	4.00	3.00	3.50
	<i>Mo</i>	1	1	1	1	1
	<i>SD</i>	1.98	2.05	2.02	2.02	2.00

Note: Items of the race dimension with higher and lower score and those of the knowledge branches with higher and lower score are presented in bold.

Among the students of Health Sciences and Engineering and Architecture there are also differences, being the student of Engineering and Architecture the one that shows a higher valuation of the items *I have made entirely some work from fragments literally copied from web pages* ($U=6943.500$; $p=.009$), *I have made entirely some work from printed sources, without mentioning the authors* ($U=7340.000$; $p=.025$) and *I have used excerpts from the teachers' notes to elaborate some work, without mentioning them* ($U=7048.000$; $p=.010$). Similarly, it is the students of Arts and

Humanities who show a higher assessment than the students of Health Sciences of the item *I have delivered as own some complete work downloaded from the Internet, without modifying it* ($U=1740.000$; $p=.004$).

There are also differences between the students of the branches of knowledge of Health Sciences and Sciences in the items *I have copied from web pages text fragments and, without quoting them, I incorporated them into the work I had written* ($U=551966.000$; $p<.001$), *I have copied*

excerpts from printed sources (books, newspapers, magazine articles, etc.) and, without quoting them, I have incorporated them into the work I had written (U=559233.500; p=.010), I have done some work entirely from printed sources, without mentioning the authors (U=571550.000; p=.026) and I have used excerpts from teachers' notes to elaborate some work, without mentioning them (U=559422.000; p=.002). In all items except the latter, the highest scores are in favour of students in Health Sciences.

On the other hand, it is the students of Social and Legal Sciences who score higher than those of Sciences in the items *I have copied from web pages text fragments and, without quoting, I have incorporated them to the work I had written (U=892.500; p=.001), I have copied excerpts from printed sources (books, newspapers, magazine articles, etc.) and, without quoting them, I have incorporated them into the work I had written (U=808.000; p<.001), I have done entirely some work from fragments literally copied from web pages (U=1136.500; p=.049) and I have done some work entirely from printed sources, without mentioning the authors (U=1126.500; p=.040).* It is also this student, compared to the Arts and Humanities, that shows higher ratings in the items *I have copied from web pages text fragments and, without quoting, I incorporated them into the work I had written (U=1536.500; p=.046), I have copied excerpts from printed sources (books, newspapers, magazine articles, etc.) and, without mentioning them, I have incorporated them into my written work (U=1423.000; p=.013).*

On the other hand, the Science students show higher scores in the items *I have copied from web pages text fragments and, without quoting, I incorporated them into the work I had written (U=1398.000; p=.035), I have done entirely some work from fragments literally copied from web pages (U=1418.000; p=.032) and I have used excerpts from teachers' notes to elaborate some work, without mentioning them (U=1167.500 ; p=.002)* with respect to the Arts and Humanities.

Finally, the students of Engineering and Architecture value significantly higher all items compared to the students of Arts and Humanities and Social and Legal Sciences. Its score is higher with respect to the Science students as well as in the items *I have delivered some work done by others in previous courses (U=6198.500; p=.029) and I have delivered as my own some complete work downloaded from the Internet, without modifying it (U=692.000; p=.012).*

Association between the frequency of academic plagiarism commission by university students and that university professors consider it as an evaluation criterion

In order to verify the association between the frequency of the plagiarism commission and the correct citation of documentary sources as the evaluation criterion, the Mann-Whitney U test was again calculated for two independent samples.

The results given in Table 6 lead to the rejection of H_0 , which provides evidence of statistically significant differences between the group of students whose teachers evaluate the correct citation of sources and the group of students whose teachers do not take into account the correct citation of sources in the process of evaluation on all items except the item *I have delivered as my own some complete work downloaded from the Internet, unchanged (U=4567603.500; p=.261).*

The values of the ranges show that marks in the group of students whose faculty assesses the correct citation of sources are lower than the group of students whose faculty does not take into account the correct citation of sources in the evaluation process, which means they commit a lesser degree of plagiarism.

The biggest differences in the average range are presented in actions that have to do with copying fragments, *I have copied from web pages snippets of texts and, without quoting, I incorporated them into the work I had written and I have used excerpts from teachers' notes to elaborate some work, without mentioning them* and the minor differences with actions

relating to copies of total character *I have delivered some work done by others in previous courses* and *I have done entirely some*

work from printed sources, without mentioning the authors.

Table 6. Mann-Whitney U test

Students	Item 1T _a	n	Range	U	Z	p
Item 1C	Yes (>= 3)	7570	4365.72	4392269.500	-3.277	.001
	No (< 3)	1218	4573.37			
Item 2C	Yes (>= 3)	7587	4313.84	3943991.000	-8.370	.000
	No (< 3)	1218	4958.41			
Item 3C	Yes (>= 3)	7569	4321.81	4063142.500	-6.433	.000
	No (< 3)	1209	4813.25			
Item 4C	Yes (>= 3)	7586	4395.61	4567603.500	-1.123	.261
	No (< 3)	1218	4445.42			
Item 5C	Yes (>= 3)	7571	4350.20	4271546.500	-4.463	.000
	No (< 3)	1213	4656.53			
Item 6C	Yes (>= 3)	7579	4357.86	4303780.500	-4.237	.000
	No (< 3)	1216	4648.21			
Item 7C	Yes (>= 3)	7590	4328.86	4048182.500	-6.950	.000
	No (< 3)	1215	4866.16			

Note: a This average was obtained from the analysis of the values between 1 and 7; assigning values equal to or greater than 3 as positive (teachers evaluate the correct citation of sources) and those under 3 as negative (teachers do not evaluate the correct citation of sources).

Table 7 below shows the results of the differences between the two variables in the five branches of knowledge.

The result of the contrast between the students of Arts and Humanities in relation to the evaluation by the teachers of the correct citation of documentary sources in the works reveals the existence of statistically significant differences in three of the seven items of the dimension throughout the degree, *I have delivered some work done by others in previous courses* ($U=13143.000$; $p<.001$), *I have copied data fragments from web pages, and without quoting, I have incorporated them into the work I had written* ($U=12752.500$; $p=.006$) and *I have delivered as my own some complete work downloaded from the Internet, without modifying it* ($U=14192.000$; $p=.001$). In all cases, it is the students whose teachers take the citation from sources into account in the evaluation of academic papers who obtain a lower average rank than those who do not take this criterion into account in the evaluation.

With regard to science students, the differences found are only given in the item *I*

have done some work done entirely by others in previous years ($U=53660.500$; $p=.007$). Unlike in the other branches of knowledge, students, whose teachers do not take into account the citation of sources in the evaluation, obtain a lower average rank.

In reference to the students of Health Sciences, statistically significant differences are observed in the items *I have copied from web pages data fragments, and without quoting, I have incorporated them to the work I had written* ($U=105114.500$; $p=.004$), *I have copied excerpts from printed sources (books, newspapers, magazine articles, etc.) and without quoting them, I have incorporated them into the work I had written* ($U=109399.500$; $p=.042$), *I have done entirely some work from fragments literally copied from web pages* ($U=108172.000$; $p=.016$) and *I have done some work entirely from printed sources, without mentioning the authors* ($U=105960.500$; $p<.001$), being in all cases the students, whose teachers consider the citation as evaluation criterion, who scores significantly lower in the plagiarism commission.

The results of the Social and Legal Sciences students are in the same vein. In this regard, it should be noted that the differences found are found in the same items as those found in the Health Sciences students, in addition to the item *I have used excerpts from the teachers' notes to elaborate some work, without mentioning them* ($U=1093829.500$; $p<.001$) is again the student whose teacher takes into account in the evaluation the correct of documentary sources, the one who commits less usually dishonest practices in the accomplishment of the academic works.

Finally, in the students of Engineering and Architecture the only differences found are given in the item *I have delivered fragments of the teachers' notes to elaborate some work, without mentioning them* ($U=59594.000$; $p=.007$). In line with the results of the other branches of knowledge, it is the pupils whose teachers take into account in the evaluation the correct citation of documentary sources, the one that scores significantly lower in the plagiarism commission than the one whose teachers do not take it into account when evaluating.

Table 7. Mann-Whitney U-test by branch of knowledge

Branch	Students	Ítem 1T _a	n	Range	U	Z	p
Arts and Humanities	Ítem 1C	Yes (≥ 3)	543	296.20	13143.000	-3.604	.000
		No (< 3)	59	350.24			
	Ítem 2C	Yes (≥ 3)	544	295.94	12752.500	-2.746	.006
		No (< 3)	59	357.86			
	Ítem 4C	Yes (≥ 3)	544	298.14	14192.000	-3.260	.001
		No (< 3)	59	332.46			
Sciences	Ítem 5C	Yes (≥ 3)	602	412.36	53660.500	-2.720	.007
		No (< 3)	200	368.80			
Health Sciences	Ítem 2C	Yes (≥ 3)	1282	723.49	105114.500	-2.878	.004
		No (< 3)	188	817.38			
	Ítem 3C	Yes (≥ 3)	1278	725.10	109399.500	-2.029	.042
		No (< 3)	188	790.59			
	Ítem 5C	Yes (≥ 3)	1279	724.58	108172.000	-2.416	.016
		No (< 3)	187	794.54			
	Ítem 6C	Yes (≥ 3)	1281	723.72	105960.500	-3.195	.001
		No (< 3)	189	815.36			
Social and Legal Sciences	Ítem 2C	Yes (≥ 3)	4460	2568.45	1061269.500	-6.734	.000
		No (< 3)	573	2894.87			
	Ítem 3C	Yes (≥ 3)	4450	2469.37	1085205.500	-5.894	.000
		No (< 3)	572	2839.29			
	Ítem 5C	Yes (≥ 3)	4452	2477.16	1115941.500	-5.409	.000
		No (< 3)	571	2783.64			
	Ítem 6C	Yes (≥ 3)	4455	2493.29	1181884.000	-3.194	.001
		No (< 3)	572	2675.27			
	Ítem 7C	Yes (≥ 3)	4462	2476.64	1093829.500	-5.666	.000
		No (< 3)	572	2836.21			
Engineering and Architecture	Ítem 7C	Yes (≥ 3)	695	433.75	59594.000	-2.711	.007
		No (< 3)	196	489.75			

Note: ^aThis average was obtained from the analysis of the values between 1 and 7; assigning the values equal to or greater than 3 as positive (teachers evaluate the correct citation of sources) and those under 3 as negative (teachers do not evaluate the correct citation of sources).

Relationship between the plagiarism commission and the correct citation of documentary sources as a criterion for the evaluation of academic works

In order to understand the relationship between the subjects of the career dimension and the citation of documentary sources as a criterion for the evaluation of academic work by teachers, a correlational analysis was carried out, the results of which are presented in Table 8.

The results derived from the application of the Spearman Rho test reveal the existence of statistically significant relationships between the plagiarism commission and the citation of

documentary sources as a criterion for the evaluation of academic works by the teachers in all items.

The ratio obtained is very weak and negative, which means that students whose teaching staff assesses the correct citation of documentary sources in the works, tend to commit less plagiarism when carrying out their work, and vice versa; i.e., Students whose teaching staff does not use the correct citation of documentary sources as a criterion of evaluation tend to commit more dishonest conduct in the performance of their academic work.

Table 8. Coefficient of correlation Rho of Spearman between the items of the dimension career and the item referred to the evaluation of the teaching dimension

	Item 1T	
1. I have delivered some work done by others in previous courses	<i>r</i>	-.088
	<i>p</i>	.000
	<i>n</i>	8788
2. I have copied from web pages excerpts from text and, without quoting, incorporated them into my written work	<i>r</i>	-.145
	<i>p</i>	.000
	<i>n</i>	8805
3. I have copied excerpts from printed sources (books, newspapers, magazine articles, etc.) and, without mentioning them, have incorporated them into my written work	<i>r</i>	-.132
	<i>p</i>	.000
	<i>n</i>	8788
4. I have delivered as my own some complete work downloaded from the Internet, without modifying it	<i>r</i>	-.067
	<i>p</i>	.000
	<i>n</i>	8804
5. I have done some work entirely from fragments literally copied from web pages	<i>r</i>	-.115
	<i>p</i>	.000
	<i>n</i>	8784
6. I have entirely done some work from printed sources, without mentioning the authors	<i>r</i>	-.110
	<i>p</i>	.000
	<i>n</i>	8795
7. I have used excerpts from teachers' notes to elaborate some work, without mentioning them	<i>r</i>	-.093
	<i>p</i>	.000
	<i>n</i>	8805

The correlation analysis performed by branches of knowledge, specified in Table 9, shows, as for the total sample, the existence of statistically significant relationships between the commission of plagiarism and the correct citation of sources as a criterion of evaluation by the teachers in the students of Social and Juridical Sciences and Health Sciences in all

the items, relationship that is very weak and negative.

With regard to the knowledge branch of Arts and Humanities, note that except in the item *I have used excerpts from teachers' notes to elaborate some work, without mentioning them* ($r=-.048$; $p=.238$), where the result of the correlation is not significant, In the rest of the items the results show a similar trend to those

indicated for Social and Legal Sciences and Health Sciences.

In the specific case of the knowledge branch of science, the existence of statistically significant relationships between the correct citation of sources as a criterion of evaluation by teachers and four of the seven items of the career dimension is verified: three of them referred to the partial copy of fragments, that is, *I have copied from web pages text fragments and, without quoting, I incorporated them into the work I had written* ($r=-.073$; $p=.037$), *I have copied excerpts from printed sources (books, newspapers, magazine articles, etc.) and, without mentioning them, I have incorporated them into the work I had written* ($r=-.086$; $p=.015$), *I have used excerpts from teachers' notes to elaborate some work, without mentioning them* ($r=-.099$; $p=.005$) and one to copy the total sources, *I have done some work entirely from printed sources,*

without mentioning the authors ($r=-.070$; $p=.047$). Again, the results show a low and negative relationship that shows the tendency to commit less dishonest practices in cases where teachers take into account the correct citation of documentary sources in the evaluation of academic works.

Finally, we have to note that the results corresponding to the knowledge branch of Engineering and Architecture show that there is no relation between the item *I have delivered as own some complete work downloaded from the Internet, unchanged* and the item *Evaluates the correct citation of documentary sources* ($r=-.025$; $p=.461$) for a 95% confidence level. In the rest of the items of the career dimension the relationship is significant, low and negative, in the same line as the results obtained for the rest of branches of knowledge in which the existence of relationship is given.

Table 9. Coefficient of correlation Rho de Spearman between the items of the dimension career and the item referred to the evaluation of the dimension teacher by branch of knowledge

Items	Evaluate the correct citation of documentary sources					
	Social and Legal Sciences	Arts and Humanities	Science	Health Sciences	Engineering and architecture	
Item 1C	<i>r</i>	-.088	-.143	-.041	-.119	-.077
	<i>p</i>	.000	.000	.250	.000	.021
	<i>n</i>	5015	602	807	1472	892
Item 2C	<i>r</i>	-.137	-.233	-.073	-.135	-.136
	<i>p</i>	.000	.000	.037	.000	.000
	<i>n</i>	5033	603	806	1470	893
Item 3C	<i>r</i>	-.129	-.199	-.086	-.157	-.088
	<i>p</i>	.000	.000	.015	.000	.009
	<i>n</i>	5022	603	798	1466	889
Item 4C	<i>r</i>	-.085	-.164	.016	-.108	-.025
	<i>p</i>	.000	.000	.647	.000	.461
	<i>n</i>	5028	602	807	1466	894
Item 5C	<i>r</i>	-.121	-.153	.035	-.163	-.072
	<i>p</i>	.000	.000	.319	.000	.032
	<i>n</i>	5023	602	802	1466	891
Item 6C	<i>r</i>	-.108	-.134	-.070	-.150	-.073
	<i>p</i>	.000	.001	.047	.000	.030
	<i>n</i>	5027	602	803	1470	893
Item 7C	<i>r</i>	-.083	-.048	-.099	-.087	-.084
	<i>p</i>	.000	.238	.005	.001	.012
	<i>n</i>	5034	602	805	1473	891

Note: Items with statistically significant differences are presented in bold.

Discussion

This study has made it possible to achieve the objective set, so that it has been possible to know the perception of the Galician university students about the commission of plagiarism and to verify its relation with the evaluation made by their teachers of the citation of documentary sources in their academic works.

In general terms, it is shown that the participating university students do not commit plagiarism in their academic work, as well as the almost widespread perception that the faculty takes into account the academic fraud committed when evaluating their work. However, although the tendency towards the commission of plagiarism on the part of the students is negative, in the case of the copy of fragments (of texts, of printed sources or of notes of the teachers) the tendency reaches intermediate values, as established in other studies (Comas, Sureda, Casero, & Morey, 2011; Comas-Forgas & Sureda-Negre, 2016; Guerrero et al., 2017; Morey-López, Sureda-Negre, Oliver-Trobat, & Comas-Forgas, 2013; Sureda, Comas, & Morey, 2009; Sureda-Negre, Comas-Forgas, & Oliver-Trobat, 2015).

Analysis by branch of knowledge shows a similar trend to general opinion; total copying of works remains an unusual practice among students of the different degrees, while the use of text fragments is a more recurrent practice.

It should be noted that the students of the Engineering and Architecture degree courses have higher values in all the items referred to the Plagiarism Commission compared to the Arts and Humanities Commission which have the lowest. This suggests that the type of work requested by the teaching staff of the different degrees may condition the performance of this type of internship by students and, therefore, preventive actions should take into account the academic work that is required of this student as well as the type of evaluation that is carried out on them. Flores, Franco, Quiñónez & Reyna (2019), in relation to the Engineering branch, stress the importance of coordinating

actions between the faculty of the Applied Engineering areas and the faculty of the areas that have the preparation of academic disciplinary writings, in order to benefit students and faculty of the Engineering branch in the improvement of reports.

As it can be seen, the lowest values are found among students in the Arts and Humanities and Sciences. These results have been compared with other studies carried out at the University of the Balearic Islands, which indicate, however, that, in relation to the delivery of complete works carried out by other colleagues in previous courses, it is the students of the Social and Legal Sciences branch who commit the most plagiarism, followed by the students of Sciences and Engineering and Architecture, the Arts and Humanities and, finally, the Health Sciences (Sureda et al., 2013).

Mejía et al. (2019) anticipated the difficulty of establishing a relationship between the causes and effects that influence plagiarism, as well as between academic fraud and corrupt practices of professional practice. However, they concluded that when, the assessment process itself is not understood, it influences the decision of the student. The results obtained in the study show statistically significant differences between the group of students whose teachers evaluate the correct citation from sources and the group of students whose teachers do not take it into account. As indicated in the introduction to this paper, Guerrero et al. (2017) pointed out the significant positive links between the two variables and Fernando & Lucía (2004) indicated that the evaluation process is predictor of the plagiarism committed; results consistent with those obtained in this study.

To the previous statement it is necessary to add as an exception the item that refers to deliver a complete work downloaded from the Internet, issue, moreover, related to the obtained results, since the greater differences in the not commission of plagiarism, depending on the assessment of their teaching staff, are found in cases where students opt for copies of fragments of work.

The relationship between the two variables according to the different branches of knowledge (weak and negative) indicates that students whose teachers evaluate the correct citation of documentary sources, tend to commit less plagiarism when carrying out their work and vice versa (Fernando & Lucía, 2004; Guerrero et al., 2017).

Combating dishonesty in evaluations is a challenge for university institutions. To this end, training arrangements (courses, seminars) have been put in place to enable pupils to acquire the skills, abilities and knowledge which help them to avoid incurring them; detection (through technological tools) to detect, mainly, cases of plagiarism; and of a normative nature (through regulations and sanctions) (Sureda-Negre, Cerdà-Navarro, Calvo-Sastre, & Comas-Forgas, 2020).

This study opens up a greater need for research into the characteristics of the assessment systems used by teachers and, consequently, also into the characteristics of the teaching process-learning on which the evaluation process depends, as pointed out by Fernando & Lucía (2004), since the type of assessment carried out by the teachers has been found to influence the degree of plagiarism commission. A greater emphasis must therefore be placed on how it is produced, bearing in mind that it must offer scope for improvement.

The characteristics of the assessment process must therefore be implemented, first of all, from the design of the subjects, incorporating in the teaching guides negative evaluation criteria in case of academic dishonesty and facilitating the rules to be followed in the event of plagiarism being detected (López-Gil & Sevillano, 2020).

Secondly, during the teaching-learning process, teachers, in a transversal way, must choose activities that accustom and require students to cite and refer correctly. Even in this sense, it would be important to include the idea of Lafuente et al. (2019) who point out the importance for higher education institutions, to have guides for the preparation of academic

writing documents in order to guide students and to alleviate the practice of dishonest behaviour.

Thirdly, during the assessment process, teachers have to take time to thoroughly review students' academic work, paying attention to what is evaluated and not allowing fraud, thus giving them a negative response (Cebrián, 2019; Hu & Sun, 2016; Moreno, 1999; Sanvicén & Molina, 2015; Zenteno, 2019).

Fourthly, and in order for the whole process to lead to improvement, feedback on evaluations must be provided to pupils (Cebrián-Robles et al., 2018a; Ramírez, 2019); in this way, it can be passed on "to evaluation as a feedback mechanism, full of meaning for those who learn and for those who guide and support", as pointed out by Lucía et al. (2006, p. 42). Thus, there are works such as Diaz-Arce, Brito-González, Nieto-Trelles and Muñoz-Arévalo (2019) that have studied the effects of feedback on high school students, with positive results. The seriousness of this problem is reduced by employing a training process and subsequent feedback, which, in his opinion, could be transformed into an appropriate strategy to combat this infringement in the different institutions by correcting the problems of citation and references.

Some authors have found that throughout this process there are teachers who have relaxed their moral position on plagiarism due to certain causes (Hu & Sun, 2016), but based on the results of this study, it is found that individual efforts to stop it should not be abandoned.

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