Cultura y Educación

Media competencies of university professors and students. Comparison of levels in Spain, Portugal, Brazil and Venezuela

--Manuscript Draft--

Full Title:	Media competencies of university professors and students. Comparison of levels in Spain, Portugal, Brazil and Venezuela
Manuscript Number:	RCYE-2018-0106R1
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Article Type:	Special Issue Paper
Keywords:	Media Competence; digital literacy; university professors; university students
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Response to Reviewers:	As indicated, we have made the following changes: 1. Reference to Digital Literacy and Education: Country Reports is included in different parts of the text, included in the conclusions. 2. Improved graphics 3. An infographics of results is included. 4. Corrected error in sample quantity 5. The percentages are adapted 6. Errata and drafting errors have been corrected 7. Ibero-American is corrected by European and American countries. 8. The term Web 2.0 is changed to Interoperability. 9. The title is modified by removing Fake news and in the text, centering it more on the object of study.
Funding Information:	Ministerio de Economía y Competitividad (EDU2015-64015-C3-1-R) — Not applicable
	European Regional Development Fund (EDU2016-81772-REDT) — Not applicable
Additional Information:	
Question	**Response**

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Acknowledgements

This research forms part of the work carried out by the Alfamed group (EuroAmerican Interuniversity Network for Research on Media Competences for Citizens), with the support of the Coordinated I+D+I Project called “Citizens’ Media Competences in emerging digital media (smartphones and tablets): innovative practices and educommunication strategies in multiple contexts” (EDU2015-64015-C3-1-R) (MINECO/FEDER), and of the “Media Education Network” of the State Program for the Promotion of Excellence in Scientific-Technical Research, the State Subprogram for Knowledge Generation (EDU2016-81772-REDT), financed by FEDER (European Regional Development Fund) and Spain’s Ministry of Economy and Competitiveness.

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Abstract

Media competences are a set of skills that every individual should possess in order to be able to consume and produce media and digital and information products in a critical and analytical way. This exploratory and comparative work analyses the level of media competence among 1,676 university students and 524 professors in Brazil, Spain, Portugal and Venezuela. One of the main results shows that the level of knowledge of technology and interaction –which is linked to digital competences– does not depend solely on age, thus contradicting theories of digital natives and migrants. Our study also found that the general level of media competence is no better than medium-to-low when considering language, technology, interaction, production and dissemination, ideology and values, and aesthetics. These results point to the need to develop transversal actions for instructing both university professors and students in media competences to face an ecosystem dominated by fake news and disinformation, as well as public policies directed at improving these skills among citizens at large.

Keywords

Media competence, digital literacy, university professors, university students

Introduction

The new communication ecosystem characterized by prodigious, omnipresent media and digital consumption has created a new mediatized society (Carlsson, 2011; XXX, 2016) marked by communication paradigms and a blurring of the border between the real and the virtual (Ramírez-García & González-Fernández, 2016). The traditional approach of research on communication is in need of a reset based on the dynamics of mediamorphosis (Area & Pessoa, 2012; XXXX 2016); instead of seeking to measure the power and influence of the media on their audiences and the effect of media on cultures (Hjavard, 2008), it is necessary to refocus investigative efforts on media literacy, especially in warning of the dangers of

inappropriate and disproportionate consumption of media (García-Ruíz, Ramírez-García, & Rodríguez-Rosell, 2014), such as data smog, infoxication, fake news and clickbaiting.

The challenge is to diagnose and understand citizens' habits in their use and consumption of Information and Communication Technologies (ICT) in order to adapt media education as needed (García-Ruíz, Gozálvez-Pérez & Aguaded, 2014), while providing infodiet proposals that promote forms of usage and appropriation of media that are suitable for each prosumer profile, avoiding information oversaturation, bias and a preference for pseudo-information (XXX, 2015). The detailed analysis of media competences has become such an urgent task in promoting critical education (Gutiérrez & Tyner, 2012) that international multilateral bodies such as the UN, UNESCO (1999; 2007; 2011) and the European Commission (2007) have all shown a keen interest in improving access to, and use of, media by strongly supporting the educommunication initiatives.

Being immersed in the information society does not necessarily mean that citizens have acquired the appropriate digital and media competences, and critical consumption of media is by no means guaranteed (XXX, 2014). Control of the technological tools is neither generalized nor homogenous, instead it is obvious that there is an imbalance between an elite that dominates digital interactions and a majority that is incapable of understanding, controlling and making good use of these tools (Ambròs & Breu, 2011). Beyond the phenomenon of the "digital divide" –for reasons that are economic, age-related, generational or to do with access to technologies– there are the "analfanauts", individuals who can use ICT skills but lack a sufficient level of competence to make suitable use of them (XXX, 2016).

These differences are also the result of the geographical setting, as illustrated by the Digital Literacy and Education: Country Reports[1], an outcome of a COST (European Cooperation in Science and Technology) research project, which reveals differences in the levels of media and

[1] Retrieved from: https://www.is1401eln.eu/en/gca/index.php?id=149 (25/09/2018)

digital competence in countries such as Ireland, Italy, Portugal, Serbia, Spain and the United Kingdom.

It is because of this heterogeneity of media use and consumption habits that we could be witnessing a new form of social exclusion that not only demands traditional literacy skills (reading, writing and understanding texts) that are static and generalist, but also to be literate in media, which is more dynamic and complex, in which individuals are capable of accessing and understanding systems and symbolic forms of knowledge transmitted via media (Area, 2012), while also understanding the elasticity of their dimensions of language, aesthetics, technology, interaction, production and dissemination, their values and ideologies (Ferrés & Piscitelli, 2012). Media literacy needs to promote teaching and learning processes that centre not only on the message reception, but also on their "production and emission in a way that is critical, creative, collective and dialogical, conscious and emotional (García-Ruíz, Ramírez-García, & Rodríguez-Rosell, 2014, p. 17).

Literature review and theoretical framework

There have been many studies measuring the levels of media competence in age-based and population-based groups, in particular research on children and teenagers (Buckingham *et al*., 2005; Calvani *et al*., 2011; García-Ruíz, Ramírez-García, & Rodríguez-Rosell, 2014), school teachers (Jimoyiannnis & Gravani, 2011; González-Fernández, Gozálvez-Pérez, & Ramírez-García, 2015; Rivera-Rogel *et al.* 2017), parents of school-aged children (García-Ruíz, Gozálvez-Pérez & Aguaded, 2014), and on adults and seniors (Livingstone *et al*., 2005; Tirado *et al.*, 2012; XXX, 2014; Román-García, Almansa-Martínez, & Cruz-Díaz, 2016).

The study of media competence in university students and professors has been conducted by Cabero-Almenara and Guerra-Liaño (2011) on students studying degrees in Teaching in Spain, and by del-Valle, Denegri and Chávez (2012) in Chile, as well as research by XXX (2016), XXX (2016) and Cortés-Montalvo, XXX (2016) on students of Journalism and university

professors in Latin America, while Martín-Jiménez, Ballesteros-Herencia and Etura-Hernández (2016) have conducted similar studies in Spain. Other studies, by Hanson-Baldauf and Hughes-Hassell (2009), have focused on Library Science students at 79 universities in the USA, and Borroneo (2016) analysed students at the Partido State University in The Philippines; other contributions have come from Fedorov and Levitskaya (2016), in a study of 120 university students in Taganrov (Russia), and de Koc and Barut (2016) on 1,226 students studying at Turkish universities.

However, these studies only analysed subjects on a national basis without comparing media competence levels between the two groups (university students and professors) or between countries; the general objective of our study does precisely this by analysing level of media competence of university students and professors across four countries, two European (Spain and Portugal) and two in Latin America (Brazil and Venezuela[i]), in order to identify their singularities, similarities and differences in prosumer habits, based on the media competence dimensions articulated by Ferrés and Piscitelli (2012) on the use and knowledge of media and Web 2.0, and on teachers' responsibility and their adequate use of technologies.

Media Competence Dimensions

The European Commission (2011) defines media competence as the set of skills needed to receive, analyse and enjoy the power of messages, images, stimuli and sounds emitted by the media in order to satisfy the need for information, communication, education and/or expression.

Ferrés & Piscitelli (2012), reformulating the four competences proposed by Buckingham (2003) and subsequently analysed by Ferrés (2007), articulated a series of six interrelated dimensions each including indicators that enable the researcher to assess and evaluate the

acquisition of these competences in individuals. Our study uses these six dimensions as the initial reference framework for our analysis, which are:

Table 1.

This study takes these proposals for dimensions and indicators as a base to diagnose and ascertain levels of media competence, and also includes the "social media" that are becoming increasingly significant and transcendent in the current communication ecosystem (Ferrés and Masanet, 2016). As well as the six dimensions detailed above, and updated by XXX (2012), two more dimensions were added to the design of the instrument used in the evaluation for this research: i) the use and knowledge of media and Web 2.0 and; ii) responsibility and the correct use of technologies for teaching.

The "use and knowledge of media and Web 2.0" dimension refers to the university professors' media-digital competences and capacities, taking into account the age and generational differences within this group (Bennet *et al*., 2008; Fernández & Fernández, 2016; Pérez-Escoda, Castro-Zubizarreta, & Fandos-Igado, 2016) that might figure in comparison to a younger population (the students), in the traditional use of these tools. The second new dimension, "responsibility and the correct use of technologies in teaching", aims to analyse the degree of importance teaching staff give to media literacy as a transversal issue in the education they impart (McIntyre, 2016).

The results of this study on the levels of media competence in students and professors at universities in Spain, Portugal and Brazil is part of a much wider study carried out in 13 European and American countries that analysed not only these two populations but two other groups of students (primary school students aged 9 to 12, and secondary school students aged

14 to 16), the total sample numbering 13,767 participants. The study also includes data from university professors surveyed in Venezuela, but not from the students.

Material and methods

A questionnaire for university professors

Design. A four-round Delphi analysis was performed in the initial design phase of the data-gathering instrument, in which the participants were selected based on the characteristics of this methodology. Those selected were 10 experts with broad experience in media literacy and a four-person coordinating group formed of researchers from different European and Latin American countries belonging to the XXXXX network (name omitted to guarantee anonymity during peer review).

As previously mentioned, the design was based on the media competence dimensions and indicators devised by Ferrés and Piscitelli (2012), and the two extra dimensions of knowledge and use of media and Web 2.0, and responsibility and correct use of technologies in teaching, to which were added questions relating to sociodemographic profile, giving an instrument composed of 31 items.

The internal consistency analysis of the instrument –the questionnaire– was made by running the Cronbach's alpha coefficient calculator on a pilot sample of 84 university professors from 13 European and American countries (Argentina, Brazil, Bolivia, Chile, Colombia, Cuba, Ecuador, Spain, Italia, Mexico, Peru, Portugal and Venezuela). The Cronbach's alpha coefficient of the dimensions was also calculated to check the reliability of the constructs studied, with the questionnaire tested for validity of content –validated by the experts using a Likert scale– and for validity of the factorial construct –in the pilot sample.

The Cronbach's alpha coefficient for the instrument's reliability and the internal consistency was 0.94 in the pilot sample, and the results of this internal consistence test by dimension to be studied are as follows:

Table 2.

Measuring the validity of the content took into account that the instrument was executed in 13 countries with different languages and cultures. With this in mind, 14 elements were eliminated after the second round leaving 31 questions in the survey of which 8 referred to sociodemographic profile, with means above 0.8, within a cut-off range to be considered definitive or modifiable of between 0.60 and 0.79.

In the final phase to validate the questionnaire, an exploratory factor analysis with multivariate statistical techniques was run to measure the relations between the variables. The Kayser, Meyer and Olkin (KMO) sampling adequacy measure showed that all the values scored ≥0.8, the Bartlett test of sphericity had a significance of ≤0.05 and the VARIMAX rotation test for variance produced 10 factors (Eigenvalues ≥1), which explained the 73.68% in total variance.

Participants. The self-administered data-gathering instrument was applied to a random non-representative sample of 156 university professors in Brazil, 134 in Portugal and 116 in Spain (406 academics in total). The study also included 118 university teaching staff from Venezuela, and the results are presented in this research, however, it was impossible to compare the results for this group with those of university students in the same country given that the political situation in Venezuela prevented us from collecting the minimum number of answered questionnaires from them necessary for this exploratory study.

When selecting the university teaching staff for the questionnaire, the researchers took care to ensure a balanced geographical distribution of professors, as well as from a range of disciplines,

in this case from Social Sciences and Humanities (33,72%), Pure and Experimental Sciences (23,97%), Health Sciences (18,53%) as well as from Engineering and Architecture (23,78%).

Measuring the data for evaluation. As mentioned, the questionnaire consisted of 31 questions, of which the first 6 referred to the participants' sociodemographic background. The following 5 (7-11) were multiple choice questions with Likert scales, and referred to the participants' consumption habits and media-digital use in their daily and academic activities, followed by 2 multiple choice questions on the aesthetic dimension (12-13) and 2 more (14-15) covering language. Questions 16-18 focused on the technological dimension, while items 19-20 corresponded to ideology and values, with responses expressed in multiple choice form and with Likert scales. The production and dissemination dimension had 5 questions (21-25) combining multiple choice and Likert scale responses, while the interaction dimension was measured by questions 26-28 but in multiple choice format only. The extra dimension added, "teachers' responsibility", had 3 questions (29-31) combining multiple choice and Likert scale responses. The questionnaire is available for consultation on XXXXX (name omitted to guarantee anonymity during peer review).

Questionnaire for university students

Design. As in the case of the professors, the instrument designed for the university students derived from a four-round Delphi analysis, and the experts (10) who carried out the test were selected for their specialist knowledge of the field. All expert participants were from different European and Latin American countries belonging to the XXX network.

The questionnaire was formed of the 6 initial dimensions (as explained above) and the sociodemographic profile questions, so the instrument aimed at the students had 32 items, of which 7 were sociodemographic in nature and 25 concerned the reference competences.

The internal consistency analysis of the instrument –the questionnaire– was made by applying the Cronbach alpha coefficient calculator to a pilot sample of 90 students from 9 European and American universities (Brazil, Chile, Colombia, Ecuador, Spain, Mexico, Peru, Portugal and Venezuela). The Cronbach alpha coefficient for the dimensions was analysed to check the reliability of the constructs studied, and the questionnaire was tested for content validity –validated by the experts using a Likert scale– and for factorial construct validity –in the pilot sample. The Cronbach alpha coefficient obtained was 0.982 in the pilot sample. The definitive questionnaire is available for consultation on XXXXX (name omitted to guarantee anonymity during peer review).

Table 3.

Participants. The self-administered data-gathering instrument was applied to a random non-representative sample of 627 Brazilian students, 522 Portuguese students and 527 Spanish students, making a total sample of 1,676 participants. In the case of Venezuela, which also formed part of this study, only 14 questionnaires could be collected, therefore, the results from these surveys were discarded.

As in the instrument applied to the university professors, great care was taken to ensure a balanced geographical distribution, as well as including students from a range of disciplines, such as Social Sciences and Humanities, Pure and Experimental Sciences, Health Sciences, and Engineering and Architecture.

Statistical analysis. The statistical analysis was carried out using the SPSS® (v. 23) software package for a descriptive analysis to determine the sample characteristics –deviations, significances, percentages. The intergroup comparison was obtained using the x^2 test since all

the variables were quantitative. The *k* (Cohen's kappa) coefficient was calculated for each group.

Findings

The main objective of this research is to compare the level of media competence among university professors with that of university students. The results of the questionnaires for university professors in Spain, Portugal, Brazil and Venezuela by dimension, and those for the students in Spain, Portugal and Brazil, are presented below. The results for Venezuela were excluded as it was impossible to obtain a sufficiently representative sample.

Three grades of media competence, Advanced, Medium and Basic, were defined for the professors and the students in order to evaluate the results. To present the comparison between the two groups in the form of graphs, the results were tested for statistical correction. The following graphs show the results for students and teachers in each dimension (Advanced, Medium and Basic).

Comparison of the results between university professors and students

Dimension 1: Language

This dimension aimed to define the capacity of professors and students to understand various media language codes, and their skills in interpreting and assessing the resources of representation, and in analysing and evaluating the messages from the perspective of their meaning and narrative structure, and in establishing intertextual relations (see Table 1). As figure 1 shows, the Portuguese and Brazilian students had a higher level of competence than the other collectives, scoring 43.90% and 46% respectively, which corresponds to an advanced level of competence. The Spanish students were ranked medium in this dimension (an average

of 39.9%, correlating to 19.95% after considering the statistical correction factor), which points to a lack of ability for expression via systems of representation and signification.

Figure 1.

It was the university professors from Portugal who scored highest in this dimension (averaging 79.69%, readjusted to 38.35% after applying the statistical correction factor) but no country's university teachers, including the Portuguese, are advanced level for this dimension, medium being the norm among those professors polled (Spain: 66.67%; Brazil: 55.12% and Venezuela: 56.78%). The results show that, as in the case of the students, the level of media competence for this dimension among professors and students is medium.

Dimension 2: Ideology and values

This dimension is key for determining the level of citizens' media competence, and it evaluates the user's ability to understand how the media construct realities and to assess the reliability of news sources, as well as to search for, organize, contrast, prioritize and synthesize information, and their capacity to detect the underlying intentions and interests in media products. This dimension also enables researchers to know ethical attitudes regarding the downloading of news products, and the skills needed to understand the emotional content in media (see Table 1). As figure 2 shows, the data are evident especially in the case of university students. In all the countries surveyed, the level for this group is no more than basic, and the figures speak for themselves: Portugal 70.8%, Spain 79.20% and Brazil 66.30%. These data contrast with those for university professors, especially in Brazil, where the level is advanced, at more than 60%. In Venezuela (55.08% with a correction factor of 27.54%), Spain (52.14% with a 26.07% correction factor) and Portugal (55.64% with a 27.82% correction factor), they barely reach medium level which, given the vital importance of this dimension, shows evident deficiencies

in both students' and professors' media literacy skills and indicates a need for further education in this issue.

Figure 2.

Dimension 3: Technology

The indicators for this dimension enabled the researchers to evaluate citizens' capacity to manage multimedia and multimodal communication tools, and adapt technological tools to their communication objectives, and to know if they are capable of producing and controlling sounds and images based on an awareness of constructing realities. Graph 3 shows that it is the university professors in all four countries surveyed who score highest, reaching the medium level (Spain: 63.25%, Portugal 64.66%, Brazil 64.74% and Venezuela 67.80%). In contrast, the university students do not even qualify for the basic level (Spain: 44%, Portugal: 41.4% and Brazil: 42.69%).

Figure 3.

What surprises about the graph above is that it seems to contradict the presupposition that the younger you are, the greater your instrumental and technological competence. However, we should not confuse knowledge of how to use certain tools effectively with using, and being totally aware of, media and ICT in a way that goes far beyond merely relating to others and entertainment; in other words, achieving objectives related to interaction with, and integration of, technological innovations that fit the aims established by the user. In this case, it could be that the university professors have made greater efforts to learn and adapt themselves to technological changes in order to achieve specific goals adapted to their needs, and so they succeed in understanding holistically the technological potential of these instruments.

Dimension 4: Production and dissemination

Although university professors in all four countries have a greater knowledge of the technologies used by the media, as we see in graph 3, when it comes to using them to produce and disseminate messages their level of competence is no more than basic in all cases, with Venezuela standing out for its professors limited capacities in this respect (55.93%, reduced to 13.98% with factor correction). In Spain, university professors reach 51.28% (17.09% factor corrected), Portugal scores 51.13% (17.04% following factor correction) and in Brazil 75% (25% correlated), all at basic level. However, the students' level is advanced in this dimension with very similar scores across the board, as the data in the following graph show:

Figure 4.

The indicators for this dimension (see Table 1) embrace knowledge of the phases of the production process and infrastructure, accessing the appropriate media equipment, the user's capacity to work collaboratively in producing multimedia and multimodal products, and the ability to select, appropriate and transform meaningful messages, as well as the capacity to share and disseminate information through conventional and digital media. It also analyses the user's capacity to manage his/her own on and offline identity and a responsible attitude towards the control of private data or those of others, as well as knowing the concepts of individual and/or collective authorship, and the different types of copyright and Creative Commons licences. It also takes into account the capacity to generate collaboration networks and feed them.

As the graph shows, the university students have a much higher level than the professors in this dimension; this contrasts sharply with the data for the previous dimension, which is closely linked to this one.

Dimension 5: Interaction

This dimension analyses whether the users display an active critical attitude in their interventions with media, and possess the capacity to carry out collaborative work through platforms provided by the social networks, and interact with people or collectives in various media environments. It also covers knowledge of the legal actions to denounce non-compliance with communication regulations. As figure 5 demonstrates, it is the Spanish professors (100%) and their Brazilian colleagues (63.46%) who register the highest levels of competence (advanced) while the Portuguese and Venezuelan academics qualify as medium (both scoring 100% but adjusted to 50% after factor correction). Therefore, considering the dimensions reviewed so far, we can say that the professors are more competent or critical (the graph shows clear differences between countries) in interacting with media than in producing and disseminating their own messages. On the other hand, the students in all the countries surveyed scored no more than basic for this dimension (Portugal: 52.4%, Spain: 52% and Brazil: 42.69%; the definitive results adjusted for factor correction are shown in figure 5), which once again alerts us to the lack of competence in fundamental dimensions, such as this one, which hampers the development of a critically healthy citizenry.

Figure 5.

Dimension 6: Aesthetics

To be aware of the aesthetic tools applied by the media to exert influence, generate emotion and translate a message in order to make it more believable and attention-seeking is fundamental for a good level of competence in this area. This dimension also analyses users' ability to gain pleasure from the formal aspects, not just from what is communicated but also from the form in which it is communicated, and if they have sufficient sensitivity to recognize a media production's aesthetic quality, and can relate media productions to other artistic output

(see Table 1). Graph 6 shows that competence in this area is more or less equal, although only the Brazilian academics (43.91%) reach advanced level. Portuguese students (39%-19.59% factor corrected) and Spain (40.82%-20.41% factor corrected) qualify for medium level, as does all the group of professors surveyed (Portugal: 73.68%, Spain: 63.25%, Brazil 87.82% and Venezuela 78.82% before factor correction).

Figure 6.

Dimension 7. "Responsibility and use of technologies in teaching; Dimension 8. "Use and knowledge of media and Interoperability"

This section presents the results of the analysis of responses given by professors to questions that covered the responsible use of teaching technologies in the lecture room (questions 29-31) and if they did so with sufficient knowledge of media and interoperability (questions 7-11). As already mentioned, these two dimensions examine whether the professor's objective is to transmit a more didactic message using technological tools or if the professor considers it important, or takes into consideration, to improve students' level of media competence. The graph shows that the Brazilian and Venezuelan professors excel far more than their European counterparts to reach an advanced level in the section on responsibility in teaching. Portugal (48.12%) and Spain (41.88%) achieve a medium level. In the case of teachers' use of technology and interoperability, only the Spanish professors (58.12% and the Brazilians (53.21%) achieve a medium level of competence while Portugal (69.17%) and Venezuela (69.49%) are no more than basic. In short, most of the professors surveyed lack sufficient media competence in these two dimensions, making training in this area vital since professors can be the prime movers in helping to raise students' levels of media literacy and, by extension, those of young people as a whole in their respective countries.

Figure 7.

To conclude this results section and to make a general interpretation of the data obtained for the first six dimensions which compared competences between professors and students, we can state that the professors have a higher level of media competence in Interaction, Technology and Ideology and values than the students, while students are superior in Production and dissemination and Language. Both groups are similarly medium in Aesthetics. This is not to say that the students and professors are truly media competent since the most frequent levels recorded are medium and basic.

In the two extra dimensions added (Responsibility and Teachers' use of technology), except in the case of Brazil and Venezuela in the first of these, the professors are lacking in this area and only reach medium and basic levels.

In conclusion, this study underlines irrefutably the urgent need for both groups to avail themselves of more and better media education.

Figure 8.

Discussion and conclusions

To begin with, the levels of media competence –even in the dimensions of technology and interaction– are not directly related to any specific age group. Contrary to Prensky (2001), later supported by Bennet *et al*. (2008); Fernández & Fernández (2016), Pérez-Escoda, Castro-Zubizarreta & Fandos-Igado (2016), the concepts of "digital natives" and "digital migrants" could indeed make sense in terms of instrumental access to platforms and interfaces –and even of digital skills– when the level of media literacy and competence in the correct use of these instruments does not correspond to, or is or differentiated by, the age of the subject; in other words, along the lines of XXX (2014), immersion in the information society does not mean

that the citizen possesses a sufficient level of media competence to be able to consume media from a critical perspective (Ambrós & Bren, 2011).

The low levels of media competence among university students, especially in the dimension of interaction (figure 5) –with an average of 17.04%– and for the university professors in production and dissemination (graph 4) –averaging 24.37%– underlines the presence of those "analfanaut" characteristics described by XXX (2016), indicating that this type of user has acquired digital competences but lacks the capacity to analyse, filter and codify information in order to act as critical prosumers. Deficiencies in the students' level of interaction can be attributed to consumer habits more inclined to infotainment and pseudo-information, as explained by XXX (2015), while the professors' lack of knowledge of certain platforms affects their competence in production and dissemination.

The problem with "analfanauts" is that, as opposed to what happens in cases of traditional and functional illiteracy, a static diagnosis of the competences to be bolstered is difficult in that the communication ecosystem dynamic is in a state of permanent change and mediamorphosis (Area & Pessoa, 2012; XXX 2016), so, the design of any media or digital infodiet ecology risks becoming quickly obsolete. The key would seem to be to continue with education in communication in order to counteract the self-inflicted culture of infoxication, oversaturation, erroneous patterns of behaviour and consumption habits affecting citizens that had not been foreseen earlier, and the subsequent culture of prosumption, in which fake news prevails. This means that rather than acquiring the tools necessary for handling information it is necessary to establish competences that the user can learn how to adjust to each changing context, supported by technological platforms that are increasingly intuitive and more accessible (XXX, 2016; Brites, 2018). In this regard, actions are being developed to equip teachers and students with these competences in the form of courses (https://miriadax.net/web/educar-para-los-nuevos-medios-competencia-mediatica-para-docentes) or materials. (XXX).

With the exception of the "ideology and values" dimension, there are no significant differences between the countries in the survey, with the subjects–the cluster– of the analysis (the students and professors) themselves being the determining factors. The university professors generally showed greater competence than the students in ideology and values (graph 2), technology (graph 3), aesthetics (graph 6) and interaction (graph 5) –the latter by a wide margin– as they demonstrated greater capacity for critical understanding and better digital consumption and infodiet habits, as well as a capacity for the production and dissemination of messages that were critical and dialogical, and which expressed awareness and emotion; these results match those in the study by García-Ruíz, Ramírez-García & Rodríguez Rosell (2014).

The university students scored better in competences related to language (figure 1) and production and dissemination (figure 4). In the former, they showed greater grasp of the resources used in linguistic and transmedia representation, and their intertextual relations and narratives –visual, verbal and musical codes, etc.– even demonstrating an analytical understanding of the importance of colours, typographies and subliminal messages in the texts. In the dimension of production and dissemination, the students excel in their capacity to acquire knowledge of the phases of the production process of media-digital content, the corresponding collaborative platforms and to function as prosumers (recipients, decoders, recorders and re-disseminators) of online content, even when their results were mediocre for the technology dimension –which is, of course, closely linked to the production and dissemination dimension.

In "Responsibility and use of technologies for teaching" and "Use and knowledge of media and Interoperability", which was intended only for the university professors, the survey examined the use of technological tools to enable them to present and transmit a more didactic message, as well as the time professors dedicated to using their classes in a transversal way to teach their students media literacy and a critical awareness of media. All the professors were

lacking in this capacity except in Brazil, where teaching staff admitted they felt a responsibility to instruct their students in media and digital consumption (figure 7).

Our survey shows that the university context is not exempt from the social exclusion generated by a lack of media, digital or informational skills. We concur with the Spanish results in the Digital Literacy and Education: Country Reports, concerning the need to reduce the digital divide. This can only be remediated by the appropriate form of education in media in which individuals –meaning both professors and students– can have access to, and understand, the systems and symbolic forms of knowledge transmitted by media (Area, 2012). To this end, it is essential to develop a media literacy curriculum and promote media education content and skills in order to convey them to citizens.

Finally, it is worth noting that this study has certain limitations, such as that of the instrument itself, given that the dimensions and indicators used should be adjusted to reflect the rapid transformation of the technological and social realities and to adapt it to new research involving new competences.

Notes

In the case of Venezuela, it was only possible to survey the university professors, who numbered 118, as we could not make contact with the students. During the questionnaire phase (01/02/2017 to 31/05/2017), the public and private universities in that country were shut down, on strike or were involved in demonstrations. The university authorities, under instruction from the Ministry of Popular Power for University Education in Venezuela, could not send us databases containing students' email addresses in order for us to carry out the study.

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Media competencies of university professors and students. Comparison of levels in Spain, Portugal, Brazil and Venezuela

TABLES & FIGURES LEYENDS

1º) Table 1. Dimensions and indicators of media competence, as defined by Ferrés & Piscitelli (2012)

2º) **Table 2.** Cronbach's alpha coefficient for the dimensions in the questionnaire for university professors

3º) **Table 3.** Cronbach's alpha coefficient for the dimensions in the questionnaire for university students

4º) **Figure 1.** Dimension 1: Language

5º) **Figure 2.** Dimension 2: Ideology and values

6º) **Figure 3.** Dimension 3: Technology

7º) **Figure 4.** Dimension 4: Production and dissemination

8º) **Figure 5.** Dimension 5: Interaction

9º) **Figure 6.** Dimension 6: Aesthetics

10º) Figure 7. Dimension 7. "Responsibility and use of technologies in teaching; Dimension 8. "Use and knowledge of media and Interoperability"

11º) Figura 8. Infographics of results

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Table 1.

Dimension	Area of analysis	Indicators
Languages	Skills to interpret and evaluate different codes of representation, to analyse and evaluate messages from the perspective of their meaning and of their narrative structure, as well as establishing intertextual relations.	Capacity to express oneself through systems of representation and signification
		Capacity to choose between different representation systems and styles according to the communicative situation.
		Capacity to modify existing products, conferring on them new value and meaning.
Technology	Level of effectiveness in the use of, and interaction with, ICT, and in competences for integrating technological innovations in the goals set by the user, and in the management of hypermedia, transmedia and multimodal settings.	Capacity to manage multimedia and multimodal communication tools.
		Capacity to adjust technological tools to the user's communicative objectives.
		Capacity to produce and transform sounds and images based on an awareness of the construction of realities.
Interaction	Skills for selecting, reviewing and self-assessing the media diet, and understanding consumption preferences and the needs that satisfy each communication product. Capacity to evaluate the cognitive effects of the emotions generated by media. A basic understanding of the management of leisure media and user-medium interactions.	An active, critical attitude in interactions with media.
		Capacity to undertake a collaborative task through platforms facilitated by the social networks.
		Capacity to interact with people and collectives in a range of media environments.
		Knowledge of the legal actions that can be taken in case of non-compliance with communication regulations.
Production and dissemination	Skills to differentiate between individual, collective, corporate and popular, public and private productions. Knowledge of the socioeconomic factors that interest the media, and understanding of the systems of production and mechanisms of dissemination.	Knowledge of the phases of the production and infrastructure process, and of the equipment necessary.
		Capacity to work collaboratively to produce multimedia and multimodal products.
		Capacity to select, appropriate and transform meaningful messages.
		Capacity to share and disseminate information through the various digital and conventional media.
		Capacity to manage one's own identity on and offline, and to have a responsible attitude regarding control of private data.
		Understand the concepts of individual and/or collective authorship, and the different types of copyright and Creative Commons licences.
		Capacity to generate collaboration networks and feed them.
Ideology and values	Ability to understand how the media construct socialized realities. Skills to measure the reliability of a news source, and to search for, organize, contrast, prioritize and synthesize information. Capacity to detect the underlying intentions or interests in media products. An ethical attitude towards downloading news products, and the ability to understand the emotional content of media output.	Capacity to use communication tools to transmit values.
		Capacity to produce products and to modify existing ones in order to question the values and stereotypes presented in media products.
		Capacity to make the best use of the tools available in the communication environment in order to reinforce an individual's commitment to culture and society as a citizen.
Aesthetics	Ability to get enjoyment from the formal aspects, not only from what is communicated but how it is communicated. To possess sufficient sensitivity to recognize a media product that has an aesthetic quality, and to relate media productions to other artistic creations.	Capacity to produce elemental messages that are comprehensible and which foment personal or collective levels of creativity, originality and sensitivity.
		Capacity to appropriate and transform artistic output, thus boosting creativity, innovation, experimentation and aesthetic sensitivity.

Source: Produced by the authors based on the postulates of Ferrés & Piscitelli (2012).

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Table 2.

Dimension	Cronbach α
Languages	0.777
Technology	0.830
Interaction	0.830
Production and dissemination	0.809
Ideology and values	0.889
Aesthetics	0.889
Knowledge and use of media	0.885
Teachers' responsibilities	0.820

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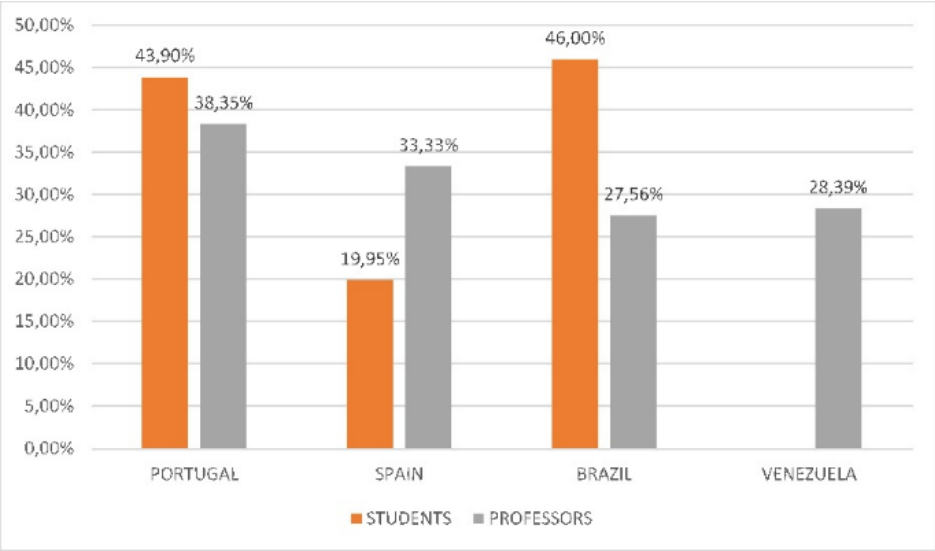
Table 3.

Dimension	Cronbach α
Languages	0.822
Technology	0.798
Interaction	0.811
Production and dissemination	0.809
Ideology and values	0.853
Aesthetics	0.896

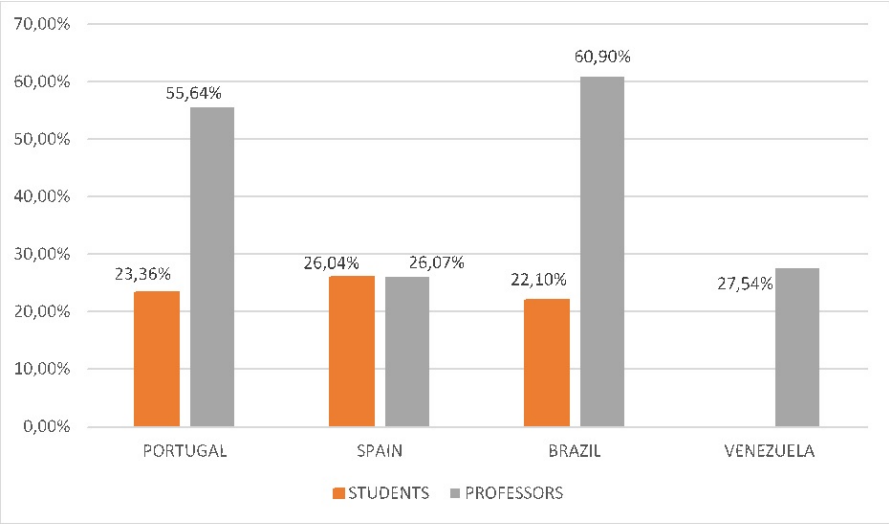
Media competencies of university professors and students. Comparison of levels in Spain, Portugal, Brazil and Venezuela

Figure 1.



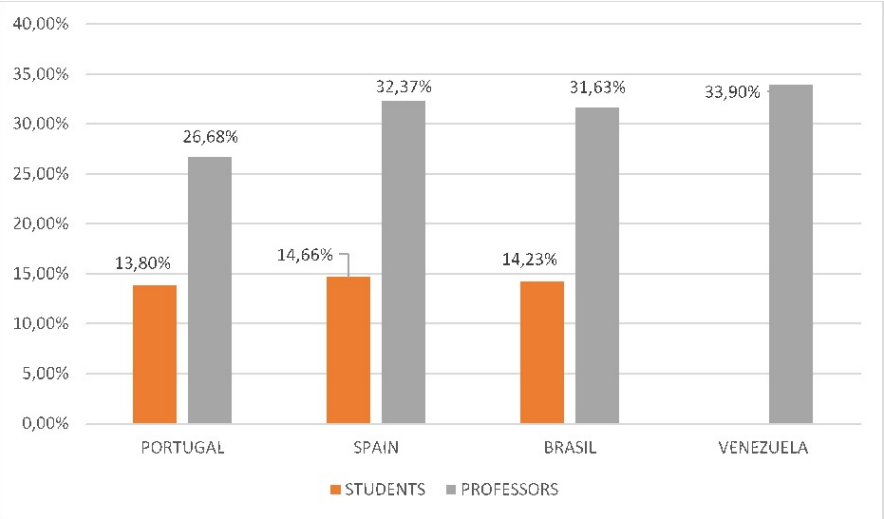
Media competencies of university professors and students. Comparison of levels in Spain, Portugal, Brazil and Venezuela

Figure 2.



Media competencies of university professors and students. Comparison of levels in Spain, Portugal, Brazil and Venezuela

Figure 3.



Media competencies of university professors and students. Comparison of levels in Spain, Portugal, Brazil and Venezuela

Figure 4.

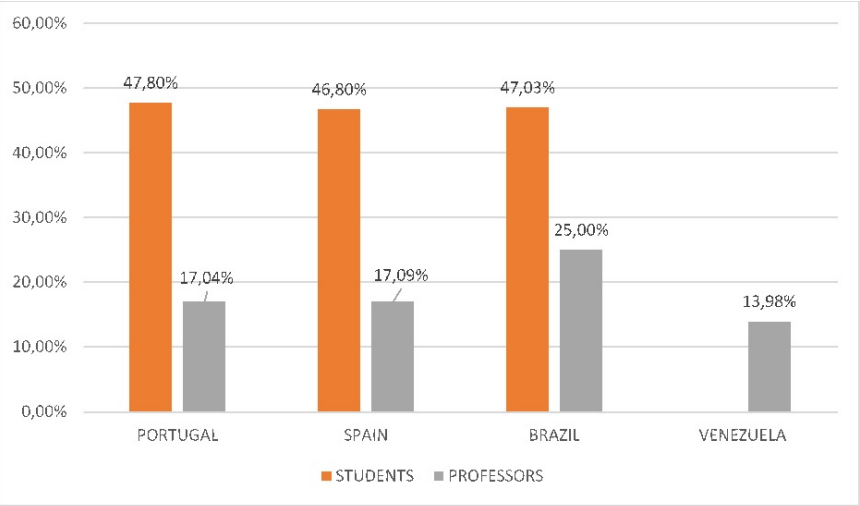


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Figure 5.

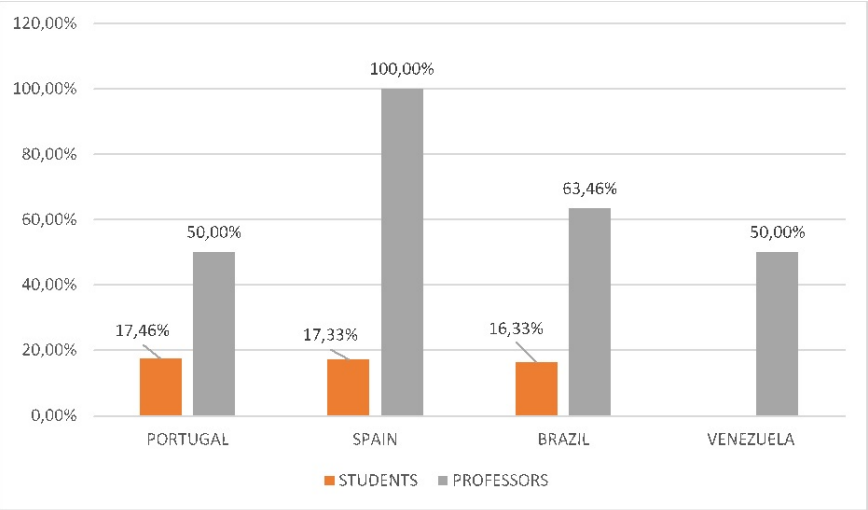

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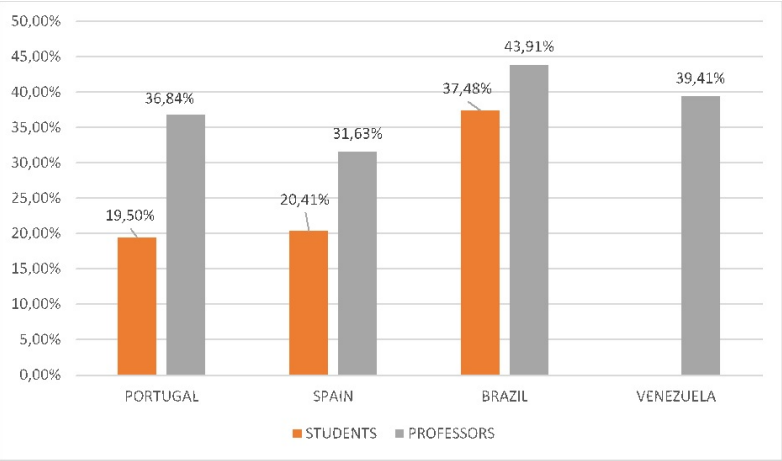
Figure 6.



Media competencies of university professors and students. Comparison of levels in Spain, Portugal, Brazil and Venezuela

Figure 7.

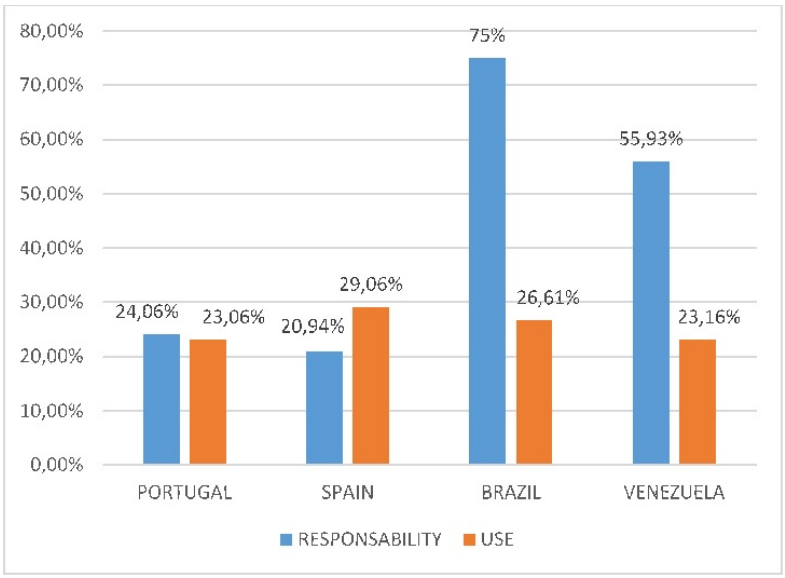


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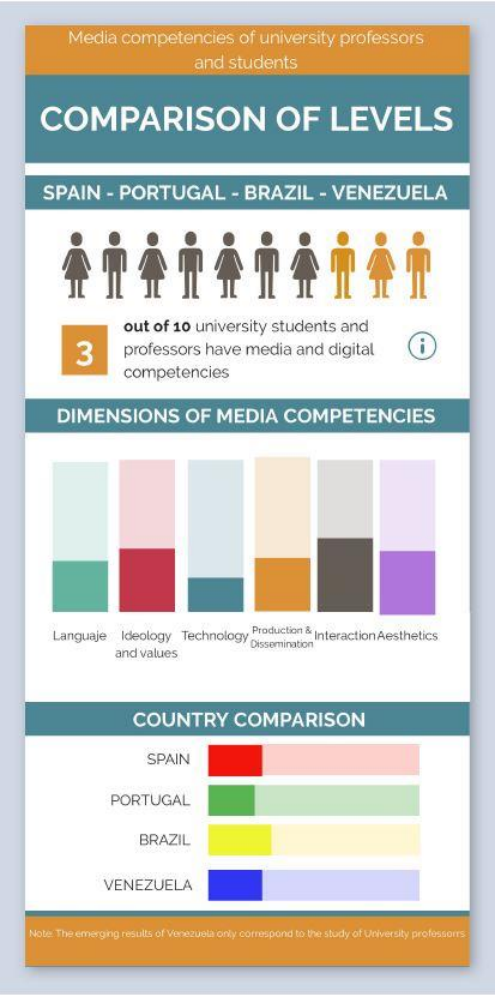
Figure 8.



Media competencies of university professors and students. Comparison of levels in Spain, Portugal, Brazil and Venezuela

Media competencies of university professors and students. Comparison of levels in Spain, Portugal, Brazil and Venezuela

Abstract

Media competences are a set of skills that every individual should possess in order to be able to consume and produce media and digital and information products in a critical and analytical way. This exploratory and comparative work analyses the level of media competence among 1,676 university students and 524 professors in Brazil, Spain, Portugal and Venezuela. One of the main results shows that the level of knowledge of technology and interaction –which is linked to digital competences– does not depend solely on age, thus contradicting theories of digital natives and migrants. Our study also found that the general level of media competence is no better than medium-to-low when considering language, technology, interaction, production and dissemination, ideology and values, and aesthetics. These results point to the need to develop transversal actions for instructing both university professors and students in media competences to face an ecosystem dominated by fake news and disinformation, as well as public policies directed at improving these skills among citizens at large.

Keywords

Media competence, digital literacy, university professors, university students

Introduction

The new communication ecosystem characterized by prodigious, omnipresent media and digital consumption has created a new mediatized society (Carlsson, 2011; XXX, 2016) marked by communication paradigms and a blurring of the border between the real and the virtual (Ramírez-García & González-Fernández, 2016). The traditional approach of research on communication is in need of a reset based on the dynamics of mediamorphosis (Area & Pessoa, 2012; XXXX 2016); instead of seeking to measure the power and influence of the media on their audiences and the effect of media on cultures (Hjavard, 2008), it is necessary to refocus investigative efforts on media literacy, especially in warning of the dangers of

inappropriate and disproportionate consumption of media (García-Ruíz, Ramírez-García, & Rodríguez-Rosell, 2014), such as data smog, infoxication, fake news and clickbaiting.

The challenge is to diagnose and understand citizens' habits in their use and consumption of Information and Communication Technologies (ICT) in order to adapt media education as needed (García-Ruíz, Gozálvez-Pérez & Aguaded, 2014), while providing infodiet proposals that promote forms of usage and appropriation of media that are suitable for each prosumer profile, avoiding information oversaturation, bias and a preference for pseudo-information (XXX, 2015). The detailed analysis of media competences has become such an urgent task in promoting critical education (Gutiérrez & Tyner, 2012) that international multilateral bodies such as the UN, UNESCO (1999; 2007; 2011) and the European Commission (2007) have all shown a keen interest in improving access to, and use of, media by strongly supporting the educommunication initiatives.

Being immersed in the information society does not necessarily mean that citizens have acquired the appropriate digital and media competences, and critical consumption of media is by no means guaranteed (XXX, 2014). Control of the technological tools is neither generalized nor homogenous, instead it is obvious that there is an imbalance between an elite that dominates digital interactions and a majority that is incapable of understanding, controlling and making good use of these tools (Ambròs & Breu, 2011). Beyond the phenomenon of the "digital divide" –for reasons that are economic, age-related, generational or to do with access to technologies– there are the "analfanauts", individuals who can use ICT skills but lack a sufficient level of competence to make suitable use of them (XXX, 2016).

These differences are also the result of the geographical setting, as illustrated by the Digital Literacy and Education: Country Reports[1], an outcome of a COST (European Cooperation in

[1] Retrieved from: https://www.is1401eln.eu/en/gca/index.php?id=149 (25/09/2018)

Science and Technology) research project, which reveals differences in the levels of media and digital competence in countries such as Ireland, Italy, Portugal, Serbia, Spain and the United Kingdom.

It is because of this heterogeneity of media use and consumption habits that we could be witnessing a new form of social exclusion that not only demands traditional literacy skills (reading, writing and understanding texts) that are static and generalist, but also to be literate in media, which is more dynamic and complex, in which individuals are capable of accessing and understanding systems and symbolic forms of knowledge transmitted via media (Area, 2012), while also understanding the elasticity of their dimensions of language, aesthetics, technology, interaction, production and dissemination, their values and ideologies (Ferrés & Piscitelli, 2012). Media literacy needs to promote teaching and learning processes that centre not only on the message reception, but also on their "production and emission in a way that is critical, creative, collective and dialogical, conscious and emotional (García-Ruíz, Ramírez-García, & Rodríguez-Rosell, 2014, p. 17).

Literature review and theoretical framework

There have been many studies measuring the levels of media competence in age-based and population-based groups, in particular research on children and teenagers (Buckingham *et al*., 2005; Calvani *et al*., 2011; García-Ruíz, Ramírez-García, & Rodríguez-Rosell, 2014), school teachers (Jimoyiannnis & Gravani, 2011; González-Fernández, Gozálvez-Pérez, & Ramírez-García, 2015; Rivera-Rogel *et al.* 2017), parents of school-aged children (García-Ruíz, Gozálvez-Pérez & Aguaded, 2014), and on adults and seniors (Livingstone *et al*., 2005; Tirado *et al.*, 2012; XXX, 2014; Román-García, Almansa-Martínez, & Cruz-Díaz, 2016).

The study of media competence in university students and professors has been conducted by Cabero-Almenara and Guerra-Liaño (2011) on students studying degrees in Teaching in Spain, and by del-Valle, Denegri and Chávez (2012) in Chile, as well as research by XXX

(2016), XXX (2016) and Cortés-Montalvo, XXX (2016) on students of Journalism and university professors in Latin America, while Martín-Jiménez, Ballesteros-Herencia and Etura-Hernández (2016) have conducted similar studies in Spain. Other studies, by Hanson-Baldauf and Hughes-Hassell (2009), have focused on Library Science students at 79 universities in the USA, and Borroneo (2016) analysed students at the Partido State University in The Philippines; other contributions have come from Fedorov and Levitskaya (2016), in a study of 120 university students in Taganrov (Russia), and de Koc and Barut (2016) on 1,226 students studying at Turkish universities.

However, these studies only analysed subjects on a national basis without comparing media competence levels between the two groups (university students and professors) or between countries; the general objective of our study does precisely this by analysing level of media competence of university students and professors across four countries, two European (Spain and Portugal) and two in Latin America (Brazil and Venezuela[i]), in order to identify their singularities, similarities and differences in prosumer habits, based on the media competence dimensions articulated by Ferrés and Piscitelli (2012) on the use and knowledge of media and Web 2.0, and on teachers' responsibility and their adequate use of technologies.

Media Competence Dimensions

The European Commission (2011) defines media competence as the set of skills needed to receive, analyse and enjoy the power of messages, images, stimuli and sounds emitted by the media in order to satisfy the need for information, communication, education and/or expression.

Ferrés & Piscitelli (2012), reformulating the four competences proposed by Buckingham (2003) and subsequently analysed by Ferrés (2007), articulated a series of six interrelated dimensions each including indicators that enable the researcher to assess and evaluate the

acquisition of these competences in individuals. Our study uses these six dimensions as the initial reference framework for our analysis, which are:

Table 1.

This study takes these proposals for dimensions and indicators as a base to diagnose and ascertain levels of media competence, and also includes the "social media" that are becoming increasingly significant and transcendent in the current communication ecosystem (Ferrés and Masanet, 2016). As well as the six dimensions detailed above, and updated by XXX (2012), two more dimensions were added to the design of the instrument used in the evaluation for this research: i) the use and knowledge of media and Web 2.0 and; ii) responsibility and the correct use of technologies for teaching.

The "use and knowledge of media and Web 2.0" dimension refers to the university professors' media-digital competences and capacities, taking into account the age and generational differences within this group (Bennet *et al*., 2008; Fernández & Fernández, 2016; Pérez-Escoda, Castro-Zubizarreta, & Fandos-Igado, 2016) that might figure in comparison to a younger population (the students), in the traditional use of these tools. The second new dimension, "responsibility and the correct use of technologies in teaching", aims to analyse the degree of importance teaching staff give to media literacy as a transversal issue in the education they impart (McIntyre, 2016).

The results of this study on the levels of media competence in students and professors at universities in Spain, Portugal and Brazil is part of a much wider study carried out in 13 European and American countries that analysed not only these two populations but two other groups of students (primary school students aged 9 to 12, and secondary school students aged

14 to 16), the total sample numbering 13,767 participants. The study also includes data from university professors surveyed in Venezuela, but not from the students.

Material and methods

A questionnaire for university professors

Design. A four-round Delphi analysis was performed in the initial design phase of the data-gathering instrument, in which the participants were selected based on the characteristics of this methodology. Those selected were 10 experts with broad experience in media literacy and a four-person coordinating group formed of researchers from different European and Latin American countries belonging to the XXXXX network (name omitted to guarantee anonymity during peer review).

As previously mentioned, the design was based on the media competence dimensions and indicators devised by Ferrés and Piscitelli (2012), and the two extra dimensions of knowledge and use of media and Web 2.0, and responsibility and correct use of technologies in teaching, to which were added questions relating to sociodemographic profile, giving an instrument composed of 31 items.

The internal consistency analysis of the instrument –the questionnaire– was made by running the Cronbach's alpha coefficient calculator on a pilot sample of 84 university professors from 13 European and American countries (Argentina, Brazil, Bolivia, Chile, Colombia, Cuba, Ecuador, Spain, Italia, Mexico, Peru, Portugal and Venezuela). The Cronbach's alpha coefficient of the dimensions was also calculated to check the reliability of the constructs studied, with the questionnaire tested for validity of content –validated by the experts using a Likert scale– and for validity of the factorial construct –in the pilot sample.

The Cronbach's alpha coefficient for the instrument's reliability and the internal consistency was 0.94 in the pilot sample, and the results of this internal consistence test by dimension to be studied are as follows:

Table 2.

Measuring the validity of the content took into account that the instrument was executed in 13 countries with different languages and cultures. With this in mind, 14 elements were eliminated after the second round leaving 31 questions in the survey of which 8 referred to sociodemographic profile, with means above 0.8, within a cut-off range to be considered definitive or modifiable of between 0.60 and 0.79.

In the final phase to validate the questionnaire, an exploratory factor analysis with multivariate statistical techniques was run to measure the relations between the variables. The Kayser, Meyer and Olkin (KMO) sampling adequacy measure showed that all the values scored ≥0.8, the Bartlett test of sphericity had a significance of ≤0.05 and the VARIMAX rotation test for variance produced 10 factors (Eigenvalues ≥1), which explained the 73.68% in total variance.

Participants. The self-administered data-gathering instrument was applied to a random non-representative sample of 156 university professors in Brazil, 134 in Portugal and 116 in Spain (406 academics in total). The study also included 118 university teaching staff from Venezuela, and the results are presented in this research, however, it was impossible to compare the results for this group with those of university students in the same country given that the political situation in Venezuela prevented us from collecting the minimum number of answered questionnaires from them necessary for this exploratory study.

When selecting the university teaching staff for the questionnaire, the researchers took care to ensure a balanced geographical distribution of professors, as well as from a range of

disciplines, in this case from Social Sciences and Humanities (33,72%), Pure and Experimental Sciences (23,97%), Health Sciences (18,53%) as well as from Engineering and Architecture (23,78%).

Measuring the data for evaluation. As mentioned, the questionnaire consisted of 31 questions, of which the first 6 referred to the participants' sociodemographic background. The following 5 (7-11) were multiple choice questions with Likert scales, and referred to the participants' consumption habits and media-digital use in their daily and academic activities, followed by 2 multiple choice questions on the aesthetic dimension (12-13) and 2 more (14-15) covering language. Questions 16-18 focused on the technological dimension, while items 19-20 corresponded to ideology and values, with responses expressed in multiple choice form and with Likert scales. The production and dissemination dimension had 5 questions (21-25) combining multiple choice and Likert scale responses, while the interaction dimension was measured by questions 26-28 but in multiple choice format only. The extra dimension added, "teachers' responsibility", had 3 questions (29-31) combining multiple choice and Likert scale responses. The questionnaire is available for consultation on XXXXX (name omitted to guarantee anonymity during peer review).

Questionnaire for university students

Design. As in the case of the professors, the instrument designed for the university students derived from a four-round Delphi analysis, and the experts (10) who carried out the test were selected for their specialist knowledge of the field. All expert participants were from different European and Latin American countries belonging to the XXX network.

The questionnaire was formed of the 6 initial dimensions (as explained above) and the sociodemographic profile questions, so the instrument aimed at the students had 32 items, of which 7 were sociodemographic in nature and 25 concerned the reference competences.

The internal consistency analysis of the instrument –the questionnaire– was made by applying the Cronbach alpha coefficient calculator to a pilot sample of 90 students from 9 European and American universities (Brazil, Chile, Colombia, Ecuador, Spain, Mexico, Peru, Portugal and Venezuela). The Cronbach alpha coefficient for the dimensions was analysed to check the reliability of the constructs studied, and the questionnaire was tested for content validity –validated by the experts using a Likert scale– and for factorial construct validity –in the pilot sample. The Cronbach alpha coefficient obtained was 0.982 in the pilot sample. The definitive questionnaire is available for consultation on XXXXX (name omitted to guarantee anonymity during peer review).

Table 3.

Participants. The self-administered data-gathering instrument was applied to a random non-representative sample of 627 Brazilian students, 522 Portuguese students and 527 Spanish students, making a total sample of 1,676 participants. In the case of Venezuela, which also formed part of this study, only 14 questionnaires could be collected, therefore, the results from these surveys were discarded.

As in the instrument applied to the university professors, great care was taken to ensure a balanced geographical distribution, as well as including students from a range of disciplines, such as Social Sciences and Humanities, Pure and Experimental Sciences, Health Sciences, and Engineering and Architecture.

Statistical analysis. The statistical analysis was carried out using the SPSS® (v. 23) software package for a descriptive analysis to determine the sample characteristics –deviations, significances, percentages. The intergroup comparison was obtained using the x^2 test since all the variables were quantitative. The *k* (Cohen's kappa) coefficient was calculated for each group.

Findings

The main objective of this research is to compare the level of media competence among university professors with that of university students. The results of the questionnaires for university professors in Spain, Portugal, Brazil and Venezuela by dimension, and those for the students in Spain, Portugal and Brazil, are presented below. The results for Venezuela were excluded as it was impossible to obtain a sufficiently representative sample.

Three grades of media competence, Advanced, Medium and Basic, were defined for the professors and the students in order to evaluate the results. To present the comparison between the two groups in the form of graphs, the results were tested for statistical correction. The following graphs show the results for students and teachers in each dimension (Advanced, Medium and Basic).

Comparison of the results between university professors and students

Dimension 1: Language

This dimension aimed to define the capacity of professors and students to understand various media language codes, and their skills in interpreting and assessing the resources of representation, and in analysing and evaluating the messages from the perspective of their meaning and narrative structure, and in establishing intertextual relations (see Table 1). As figure 1 shows, the Portuguese and Brazilian students had a higher level of competence than

the other collectives, scoring 43.90% and 46% respectively, which corresponds to an advanced level of competence. The Spanish students were ranked medium in this dimension (an average of 39.9%, correlating to 19.95% after considering the statistical correction factor), which points to a lack of ability for expression via systems of representation and signification.

Figure 1.

It was the university professors from Portugal who scored highest in this dimension (averaging 79.69%, readjusted to 38.35% after applying the statistical correction factor) but no country's university teachers, including the Portuguese, are advanced level for this dimension, medium being the norm among those professors polled (Spain: 66.67%; Brazil: 55.12% and Venezuela: 56.78%). The results show that, as in the case of the students, the level of media competence for this dimension among professors and students is medium.

Dimension 2: Ideology and values

This dimension is key for determining the level of citizens' media competence, and it evaluates the user's ability to understand how the media construct realities and to assess the reliability of news sources, as well as to search for, organize, contrast, prioritize and synthesize information, and their capacity to detect the underlying intentions and interests in media products. This dimension also enables researchers to know ethical attitudes regarding the downloading of news products, and the skills needed to understand the emotional content in media (see Table 1). As figure 2 shows, the data are evident especially in the case of university students. In all the countries surveyed, the level for this group is no more than basic, and the figures speak for themselves: Portugal 70.8%, Spain 79.20% and Brazil 66.30%. These data contrast with those for university professors, especially in Brazil, where

the level is advanced, at more than 60%. In Venezuela (55.08% with a correction factor of 27.54%), Spain (52.14% with a 26.07% correction factor) and Portugal (55.64% with a 27.82% correction factor), they barely reach medium level which, given the vital importance of this dimension, shows evident deficiencies in both students' and professors' media literacy skills and indicates a need for further education in this issue.

Figure 2.

Dimension 3: Technology

The indicators for this dimension enabled the researchers to evaluate citizens' capacity to manage multimedia and multimodal communication tools, and adapt technological tools to their communication objectives, and to know if they are capable of producing and controlling sounds and images based on an awareness of constructing realities. Graph 3 shows that it is the university professors in all four countries surveyed who score highest, reaching the medium level (Spain: 63.25%, Portugal 64.66%, Brazil 64.74% and Venezuela 67.80%). In contrast, the university students do not even qualify for the basic level (Spain: 44%, Portugal: 41.4% and Brazil: 42.69%).

Figure 3.

What surprises about the graph above is that it seems to contradict the presupposition that the younger you are, the greater your instrumental and technological competence. However, we should not confuse knowledge of how to use certain tools effectively with using, and being totally aware of, media and ICT in a way that goes far beyond merely relating to others and entertainment; in other words, achieving objectives related to interaction with, and integration of, technological innovations that fit the aims established by the user. In this case, it could be that the university professors have made greater efforts to learn and adapt themselves to

technological changes in order to achieve specific goals adapted to their needs, and so they succeed in understanding holistically the technological potential of these instruments.

Dimension 4: Production and dissemination

Although university professors in all four countries have a greater knowledge of the technologies used by the media, as we see in graph 3, when it comes to using them to produce and disseminate messages their level of competence is no more than basic in all cases, with Venezuela standing out for its professors limited capacities in this respect (55.93%, reduced to 13.98% with factor correction). In Spain, university professors reach 51.28% (17.09% factor corrected), Portugal scores 51.13% (17.04% following factor correction) and in Brazil 75% (25% correlated), all at basic level. However, the students' level is advanced in this dimension with very similar scores across the board, as the data in the following graph show:

Figure 4.

The indicators for this dimension (see Table 1) embrace knowledge of the phases of the production process and infrastructure, accessing the appropriate media equipment, the user's capacity to work collaboratively in producing multimedia and multimodal products, and the ability to select, appropriate and transform meaningful messages, as well as the capacity to share and disseminate information through conventional and digital media. It also analyses the user's capacity to manage his/her own on and offline identity and a responsible attitude towards the control of private data or those of others, as well as knowing the concepts of individual and/or collective authorship, and the different types of copyright and Creative Commons licences. It also takes into account the capacity to generate collaboration networks and feed them.

As the graph shows, the university students have a much higher level than the professors in this dimension; this contrasts sharply with the data for the previous dimension, which is closely linked to this one.

Dimension 5: Interaction

This dimension analyses whether the users display an active critical attitude in their interventions with media, and possess the capacity to carry out collaborative work through platforms provided by the social networks, and interact with people or collectives in various media environments. It also covers knowledge of the legal actions to denounce non-compliance with communication regulations. As figure 5 demonstrates, it is the Spanish professors (100%) and their Brazilian colleagues (63.46%) who register the highest levels of competence (advanced) while the Portuguese and Venezuelan academics qualify as medium (both scoring 100% but adjusted to 50% after factor correction). Therefore, considering the dimensions reviewed so far, we can say that the professors are more competent or critical (the graph shows clear differences between countries) in interacting with media than in producing and disseminating their own messages. On the other hand, the students in all the countries surveyed scored no more than basic for this dimension (Portugal: 52.4%, Spain: 52% and Brazil: 42.69%; the definitive results adjusted for factor correction are shown in figure 5), which once again alerts us to the lack of competence in fundamental dimensions, such as this one, which hampers the development of a critically healthy citizenry.

Figure 5.

Dimension 6: Aesthetics

To be aware of the aesthetic tools applied by the media to exert influence, generate emotion and translate a message in order to make it more believable and attention-seeking is

fundamental for a good level of competence in this area. This dimension also analyses users' ability to gain pleasure from the formal aspects, not just from what is communicated but also from the form in which it is communicated, and if they have sufficient sensitivity to recognize a media production's aesthetic quality, and can relate media productions to other artistic output (see Table 1). Graph 6 shows that competence in this area is more or less equal, although only the Brazilian academics (43.91%) reach advanced level. Portuguese students (39%-19.59% factor corrected) and Spain (40.82%-20.41% factor corrected) qualify for medium level, as does all the group of professors surveyed (Portugal: 73.68%, Spain: 63.25%, Brazil 87.82% and Venezuela 78.82% before factor correction).

Figure 6.

Dimension 7. "Responsibility and use of technologies in teaching; Dimension 8. "Use and knowledge of media and Interoperability"

This section presents the results of the analysis of responses given by professors to questions that covered the responsible use of teaching technologies in the lecture room (questions 29-31) and if they did so with sufficient knowledge of media and interoperability (questions 7-11). As already mentioned, these two dimensions examine whether the professor's objective is to transmit a more didactic message using technological tools or if the professor considers it important, or takes into consideration, to improve students' level of media competence. The graph shows that the Brazilian and Venezuelan professors excel far more than their European counterparts to reach an advanced level in the section on responsibility in teaching. Portugal (48.12%) and Spain (41.88%) achieve a medium level. In the case of teachers' use of technology and interoperability, only the Spanish professors (58.12% and the Brazilians (53.21%) achieve a medium level of competence while Portugal (69.17%) and Venezuela (69.49%) are no more than basic. In short, most of the professors surveyed lack sufficient

media competence in these two dimensions, making training in this area vital since professors can be the prime movers in helping to raise students' levels of media literacy and, by extension, those of young people as a whole in their respective countries.

Figure 7.

To conclude this results section and to make a general interpretation of the data obtained for the first six dimensions which compared competences between professors and students, we can state that the professors have a higher level of media competence in Interaction, Technology and Ideology and values than the students, while students are superior in Production and dissemination and Language. Both groups are similarly medium in Aesthetics. This is not to say that the students and professors are truly media competent since the most frequent levels recorded are medium and basic.

In the two extra dimensions added (Responsibility and Teachers' use of technology), except in the case of Brazil and Venezuela in the first of these, the professors are lacking in this area and only reach medium and basic levels.

In conclusion, this study underlines irrefutably the urgent need for both groups to avail themselves of more and better media education.

Figure 8

Discussion and conclusions

To begin with, the levels of media competence –even in the dimensions of technology and interaction– are not directly related to any specific age group. Contrary to Prensky (2001), later supported by Bennet *et al*. (2008); Fernández & Fernández (2016), Pérez-Escoda, Castro-Zubizarreta & Fandos-Igado (2016), the concepts of "digital natives" and "digital migrants" could indeed make sense in terms of instrumental access to platforms and

interfaces –and even of digital skills– when the level of media literacy and competence in the correct use of these instruments does not correspond to, or is or differentiated by, the age of the subject; in other words, along the lines of XXX (2014), immersion in the information society does not mean that the citizen possesses a sufficient level of media competence to be able to consume media from a critical perspective (Ambrós & Bren, 2011).

The low levels of media competence among university students, especially in the dimension of interaction (figure 5) –with an average of 17.04%– and for the university professors in production and dissemination (graph 4) –averaging 24.37%– underlines the presence of those "analfanaut" characteristics described by XXX (2016), indicating that this type of user has acquired digital competences but lacks the capacity to analyse, filter and codify information in order to act as critical prosumers. Deficiencies in the students' level of interaction can be attributed to consumer habits more inclined to infotainment and pseudo-information, as explained by XXX (2015), while the professors' lack of knowledge of certain platforms affects their competence in production and dissemination.

The problem with "analfanauts" is that, as opposed to what happens in cases of traditional and functional illiteracy, a static diagnosis of the competences to be bolstered is difficult in that the communication ecosystem dynamic is in a state of permanent change and mediamorphosis (Area & Pessoa, 2012; XXX 2016), so, the design of any media or digital infodiet ecology risks becoming quickly obsolete. The key would seem to be to continue with education in communication in order to counteract the self-inflicted culture of infoxication, oversaturation, erroneous patterns of behaviour and consumption habits affecting citizens that had not been foreseen earlier, and the subsequent culture of prosumption, in which fake news prevails. This means that rather than acquiring the tools necessary for handling information it is necessary to establish competences that the user can learn how to adjust to each changing context, supported by technological platforms that are increasingly intuitive and more

accessible (XXX, 2016; Brites, 2018). In this regard, actions are being developed to equip teachers and students with these competences in the form of courses (https://miriadax.net/web/educar-para-los-nuevos-medios-competencia-mediatica-para-docentes) or materials. (XXX).

With the exception of the "ideology and values" dimension, there are no significant differences between the countries in the survey, with the subjects–the cluster– of the analysis (the students and professors) themselves being the determining factors. The university professors generally showed greater competence than the students in ideology and values (graph 2), technology (graph 3), aesthetics (graph 6) and interaction (graph 5) –the latter by a wide margin– as they demonstrated greater capacity for critical understanding and better digital consumption and infodiet habits, as well as a capacity for the production and dissemination of messages that were critical and dialogical, and which expressed awareness and emotion; these results match those in the study by García-Ruíz, Ramírez-García & Rodríguez Rosell (2014).

The university students scored better in competences related to language (figure 1) and production and dissemination (figure 4). In the former, they showed greater grasp of the resources used in linguistic and transmedia representation, and their intertextual relations and narratives –visual, verbal and musical codes, etc.– even demonstrating an analytical understanding of the importance of colours, typographies and subliminal messages in the texts. In the dimension of production and dissemination, the students excel in their capacity to acquire knowledge of the phases of the production process of media-digital content, the corresponding collaborative platforms and to function as prosumers (recipients, decoders, recorders and re-disseminators) of online content, even when their results were mediocre for the technology dimension –which is, of course, closely linked to the production and dissemination dimension.

In "Responsibility and use of technologies for teaching" and "Use and knowledge of media and Interoperability", which was intended only for the university professors, the survey examined the use of technological tools to enable them to present and transmit a more didactic message, as well as the time professors dedicated to using their classes in a transversal way to teach their students media literacy and a critical awareness of media. All the professors were lacking in this capacity except in Brazil, where teaching staff admitted they felt a responsibility to instruct their students in media and digital consumption (figure 7).

Our survey shows that the university context is not exempt from the social exclusion generated by a lack of media, digital or informational skills. We concur with the Spanish results in the Digital Literacy and Education: Country Reports, concerning the need to reduce the digital divide. This can only be remediated by the appropriate form of education in media in which individuals –meaning both professors and students– can have access to, and understand, the systems and symbolic forms of knowledge transmitted by media (Area, 2012). To this end, it is essential to develop a media literacy curriculum and promote media education content and skills in order to convey them to citizens.

Finally, it is worth noting that this study has certain limitations, such as that of the instrument itself, given that the dimensions and indicators used should be adjusted to reflect the rapid transformation of the technological and social realities and to adapt it to new research involving new competences.

Notes

In the case of Venezuela, it was only possible to survey the university professors, who numbered 118, as we could not make contact with the students. During the questionnaire phase (01/02/2017 to 31/05/2017), the public and private universities in that country were

shut down, on strike or were involved in demonstrations. The university authorities, under instruction from the Ministry of Popular Power for University Education in Venezuela, could not send us databases containing students' email addresses in order for us to carry out the study.

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Media competencies of university professors and students. Comparison of levels in Spain, Portugal, Brazil and Venezuela

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Media competencies of university professors and students. Comparison of levels in Spain, Portugal, Brazil and Venezuela

Table 1.

Dimension	Area of analysis	Indicators
Languages	Skills to interpret and evaluate different codes of representation, to analyse and evaluate messages from the perspective of their meaning and of their narrative structure, as well as establishing intertextual relations.	Capacity to express oneself through systems of representation and signification
		Capacity to choose between different representation systems and styles according to the communicative situation.
		Capacity to modify existing products, conferring on them new value and meaning.
Technology	Level of effectiveness in the use of, and interaction with, ICT, and in competences for integrating technological innovations in the goals set by the user, and in the management of hypermedia, transmedia and multimodal settings.	Capacity to manage multimedia and multimodal communication tools.
		Capacity to adjust technological tools to the user's communicative objectives.
		Capacity to produce and transform sounds and images based on an awareness of the construction of realities.
Interaction	Skills for selecting, reviewing and self-assessing the media diet, and understanding consumption preferences and the needs that satisfy each communication product. Capacity to evaluate the cognitive effects of the emotions generated by media. A basic understanding of the management of leisure media and user-medium interactions.	An active, critical attitude in interactions with media.
		Capacity to undertake a collaborative task through platforms facilitated by the social networks.
		Capacity to interact with people and collectives in a range of media environments.
		Knowledge of the legal actions that can be taken in case of non-compliance with communication regulations.
Production and dissemination	Skills to differentiate between individual, collective, corporate and popular, public and private productions. Knowledge of the socioeconomic factors that interest the media, and understanding of the systems of production and mechanisms of dissemination.	Knowledge of the phases of the production and infrastructure process, and of the equipment necessary.
		Capacity to work collaboratively to produce multimedia and multimodal products.
		Capacity to select, appropriate and transform meaningful messages.
		Capacity to share and disseminate information through the various digital and conventional media.
		Capacity to manage one's own identity on and offline, and to have a responsible attitude regarding control of private data.
		Understand the concepts of individual and/or collective authorship, and the different types of copyright and Creative Commons licences.
		Capacity to generate collaboration networks and feed them.
Ideology and values	Ability to understand how the media construct socialized realities. Skills to measure the reliability of a news source, and to search for, organize, contrast, prioritize and synthesize information. Capacity to detect the underlying intentions or interests in media products. An ethical attitude towards downloading news products, and the ability to understand the emotional content of media output.	Capacity to use communication tools to transmit values.
		Capacity to produce products and to modify existing ones in order to question the values and stereotypes presented in media products.
		Capacity to make the best use of the tools available in the communication environment in order to reinforce an individual's commitment to culture and society as a citizen.
Aesthetics	Ability to get enjoyment from the formal aspects, not only from what is communicated but how it is communicated. To possess sufficient sensitivity to recognize a media product that has an aesthetic quality, and to relate media productions to other artistic creations.	Capacity to produce elemental messages that are comprehensible and which foment personal or collective levels of creativity, originality and sensitivity.
		Capacity to appropriate and transform artistic output, thus boosting creativity, innovation, experimentation and aesthetic sensitivity.

Source: Produced by the authors based on the postulates of Ferrés & Piscitelli (2012).

Media competencies of university professors and students. Comparison of levels in Spain, Portugal, Brazil and Venezuela

Table 2.

Dimension	Cronbach α
Languages	0.777
Technology	0.830
Interaction	0.830
Production and dissemination	0.809
Ideology and values	0.889
Aesthetics	0.889
Knowledge and use of media	0.885
Teachers' responsibilities	0.820

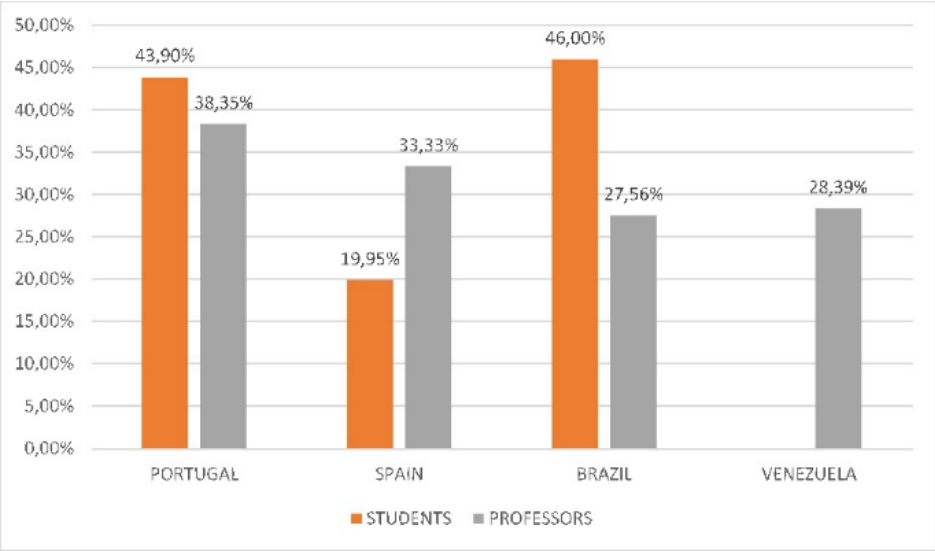
Media competencies of university professors and students. Comparison of levels in Spain, Portugal, Brazil and Venezuela

Table 3.

Dimension	Cronbach α
Languages	0.822
Technology	0.798
Interaction	0.811
Production and dissemination	0.809
Ideology and values	0.853
Aesthetics	0.896

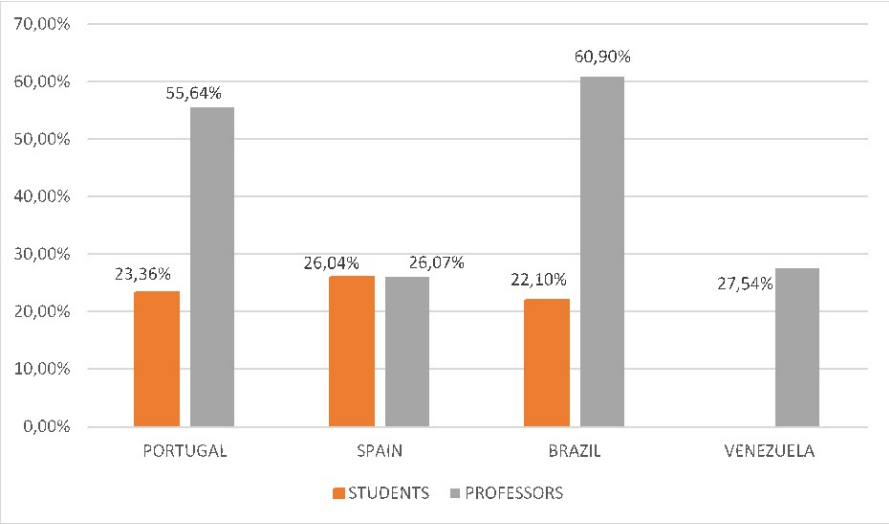
Media competencies of university professors and students. Comparison of levels in Spain, Portugal, Brazil and Venezuela

Figure 1.



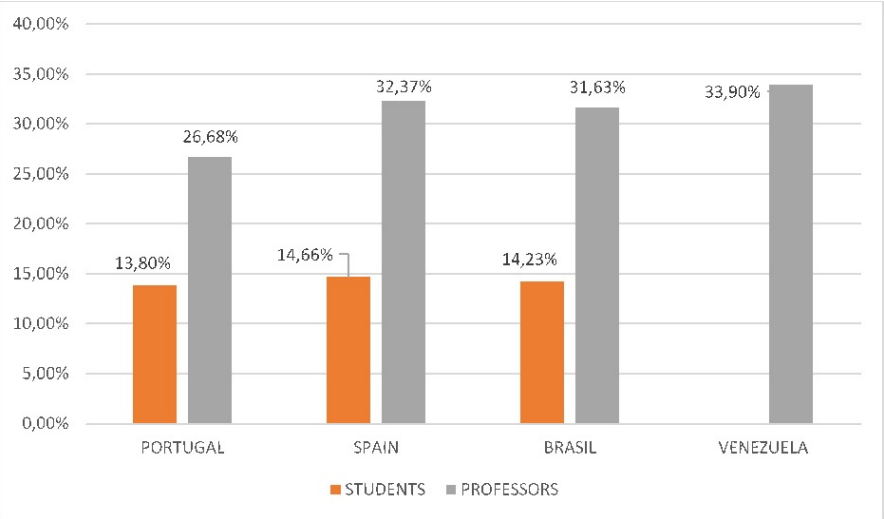
Media competencies of university professors and students. Comparison of levels in Spain, Portugal, Brazil and Venezuela

Figure 2.



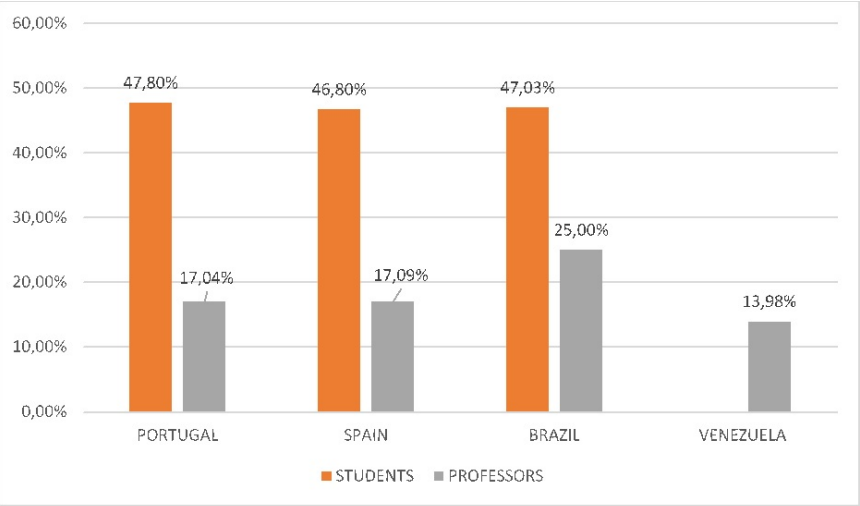
Media competencies of university professors and students. Comparison of levels in Spain, Portugal, Brazil and Venezuela

Figure 3.



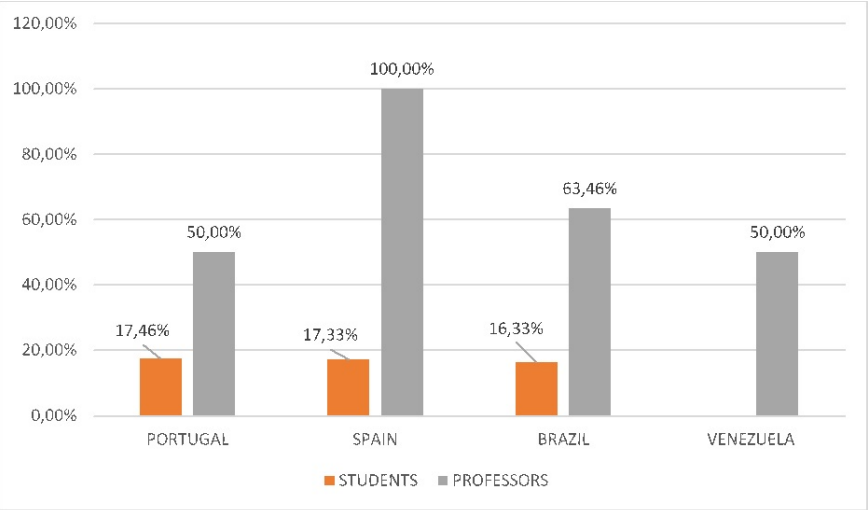
Media competencies of university professors and students. Comparison of levels in Spain, Portugal, Brazil and Venezuela

Figure 4.



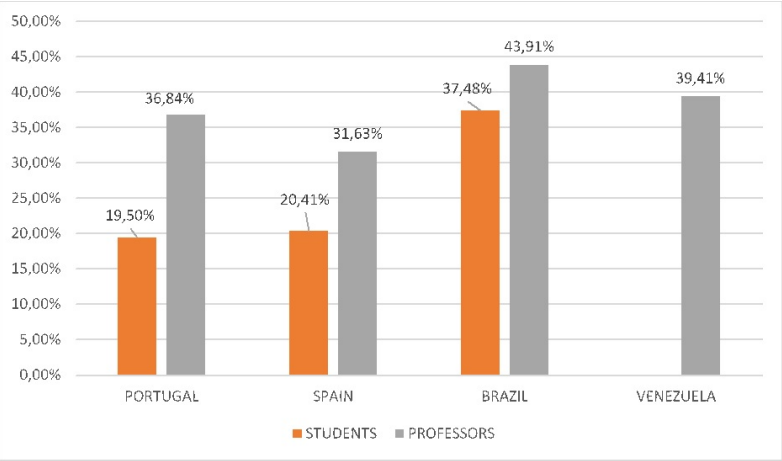
Media competencies of university professors and students. Comparison of levels in Spain, Portugal, Brazil and Venezuela

Figure 5.



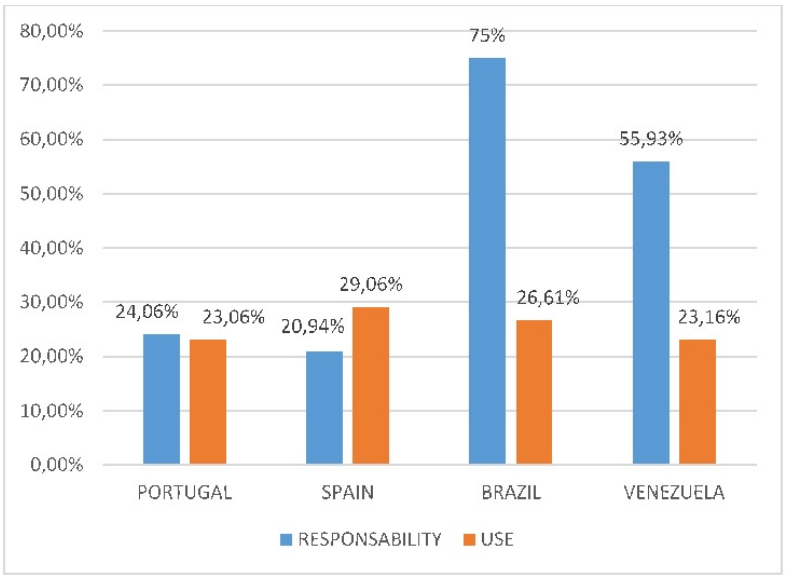
Media competencies of university professors and students. Comparison of levels in Spain, Portugal, Brazil and Venezuela

Figure 6.



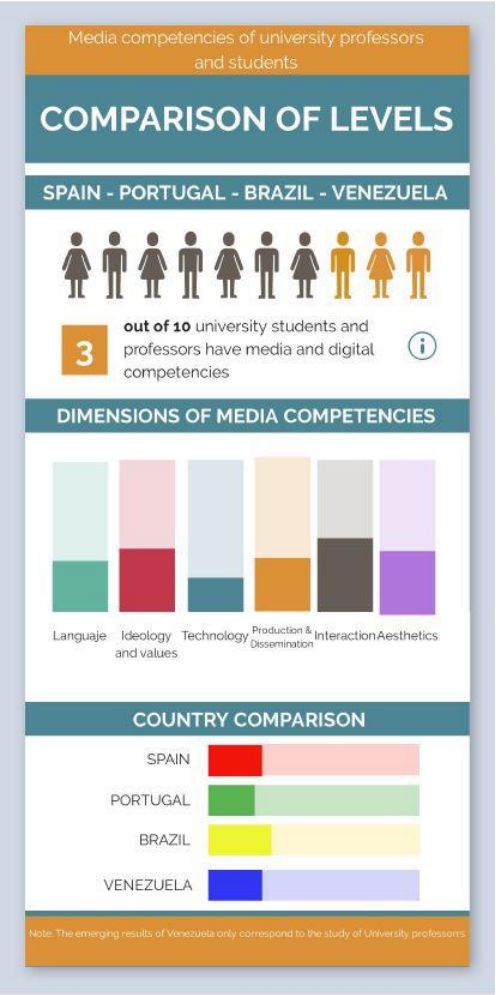
Media competencies of university professors and students. Comparison of levels in Spain, Portugal, Brazil and Venezuela

Figure 7.



Media competencies of university professors and students. Comparison of levels in Spain, Portugal, Brazil and Venezuela

Figure 8.



Dimensions and indicators of media competence, as defined by Ferrés & Piscitelli (2012)

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Dimension	Area of analysis	Indicators
Languages	Skills to interpret and evaluate different codes of representation, to analyse and evaluate messages from the perspective of their meaning and of their narrative structure, as well as establishing intertextual relations.	Capacity to express oneself through systems of representation and signification
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		Capacity to work collaboratively to produce multimedia and multimodal products.
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Dimension	Cronbach α
Languages	0.822
Technology	0.798
Interaction	0.811
Production and dissemination	0.809
Ideology and values	0.853
Aesthetics	0.896

Figure 1. Dimension 1: Language

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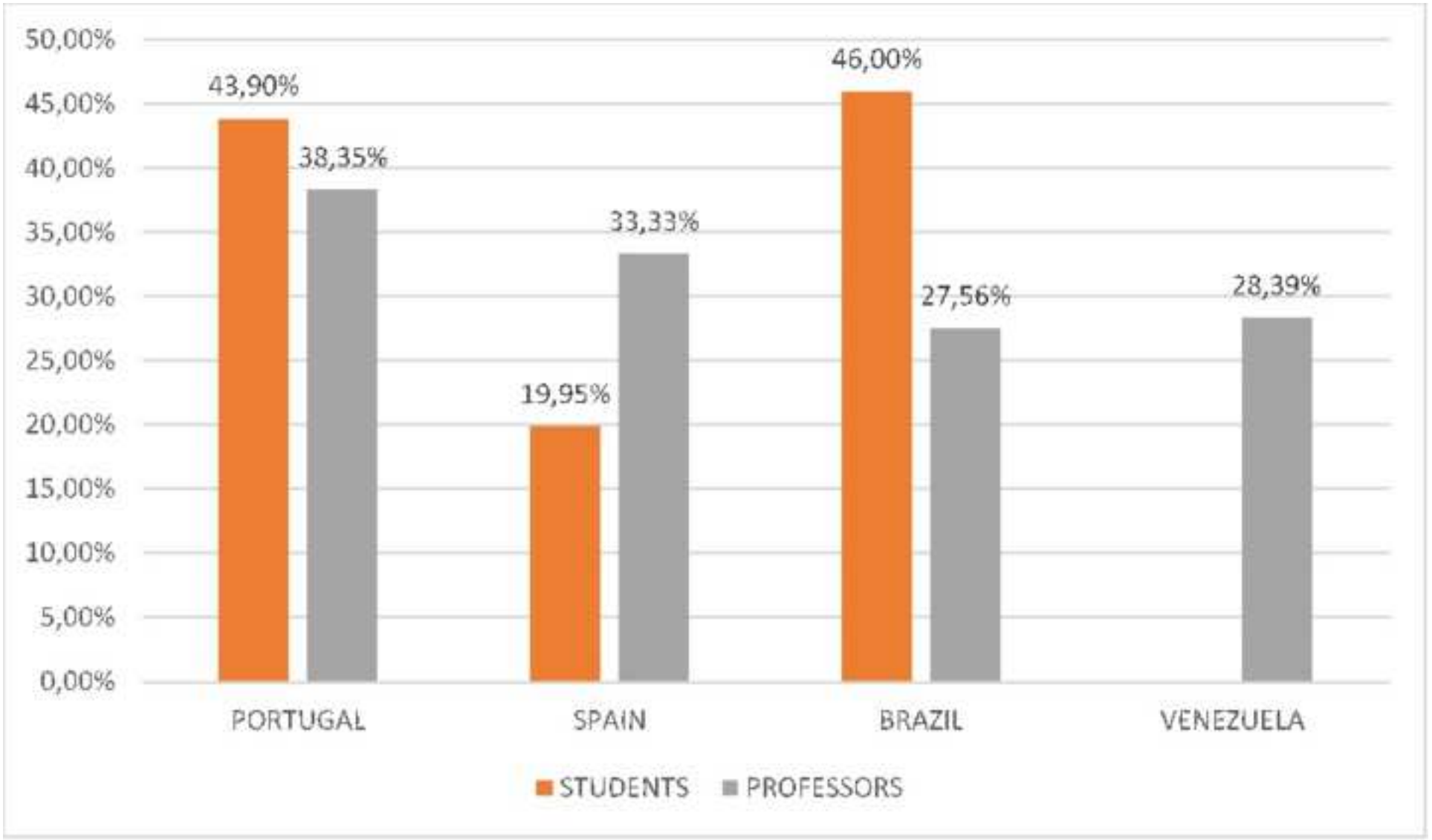

Figure 2. Dimension 2: Ideology and values

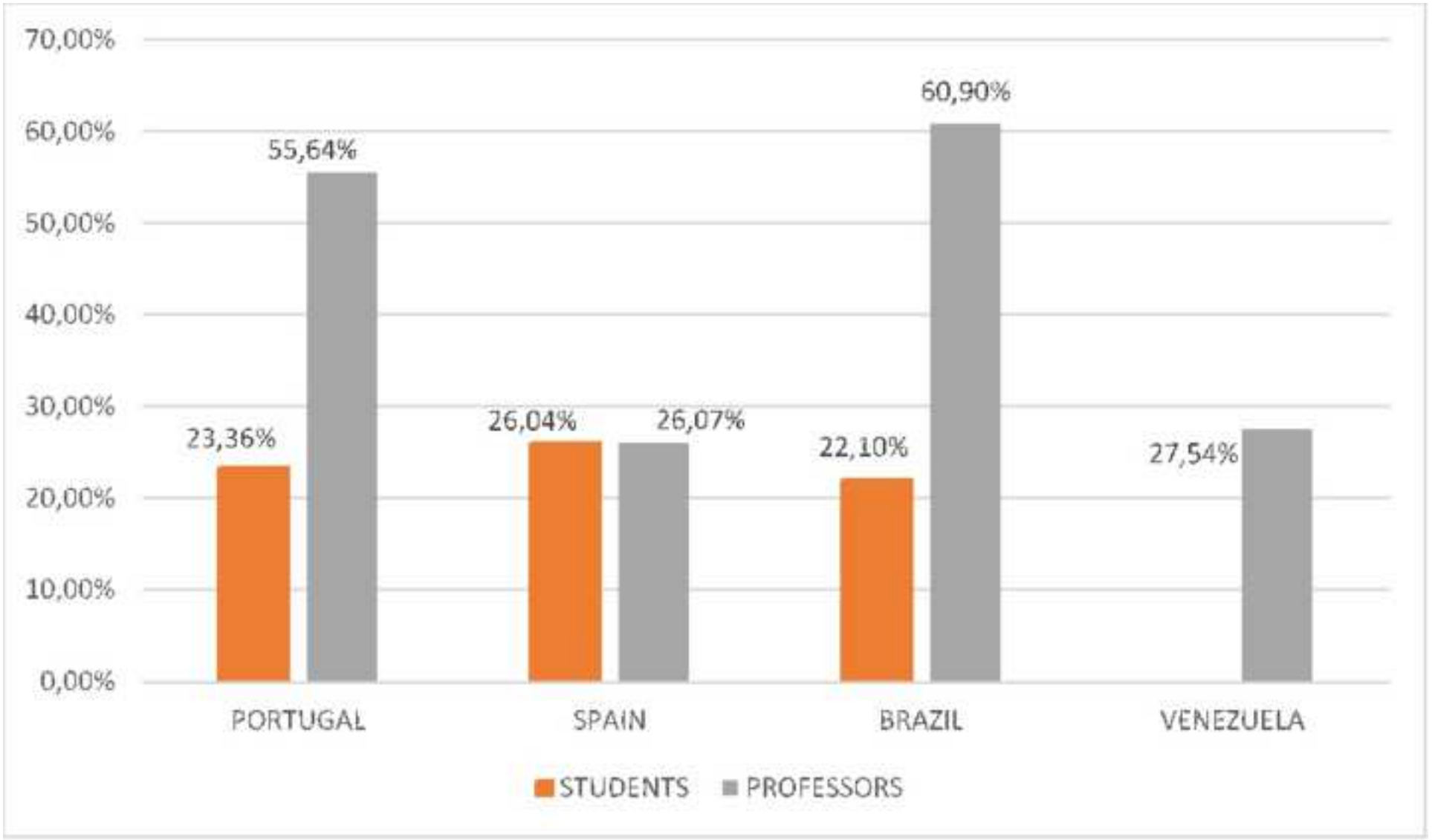

Figure 3. Dimension 3: Technology

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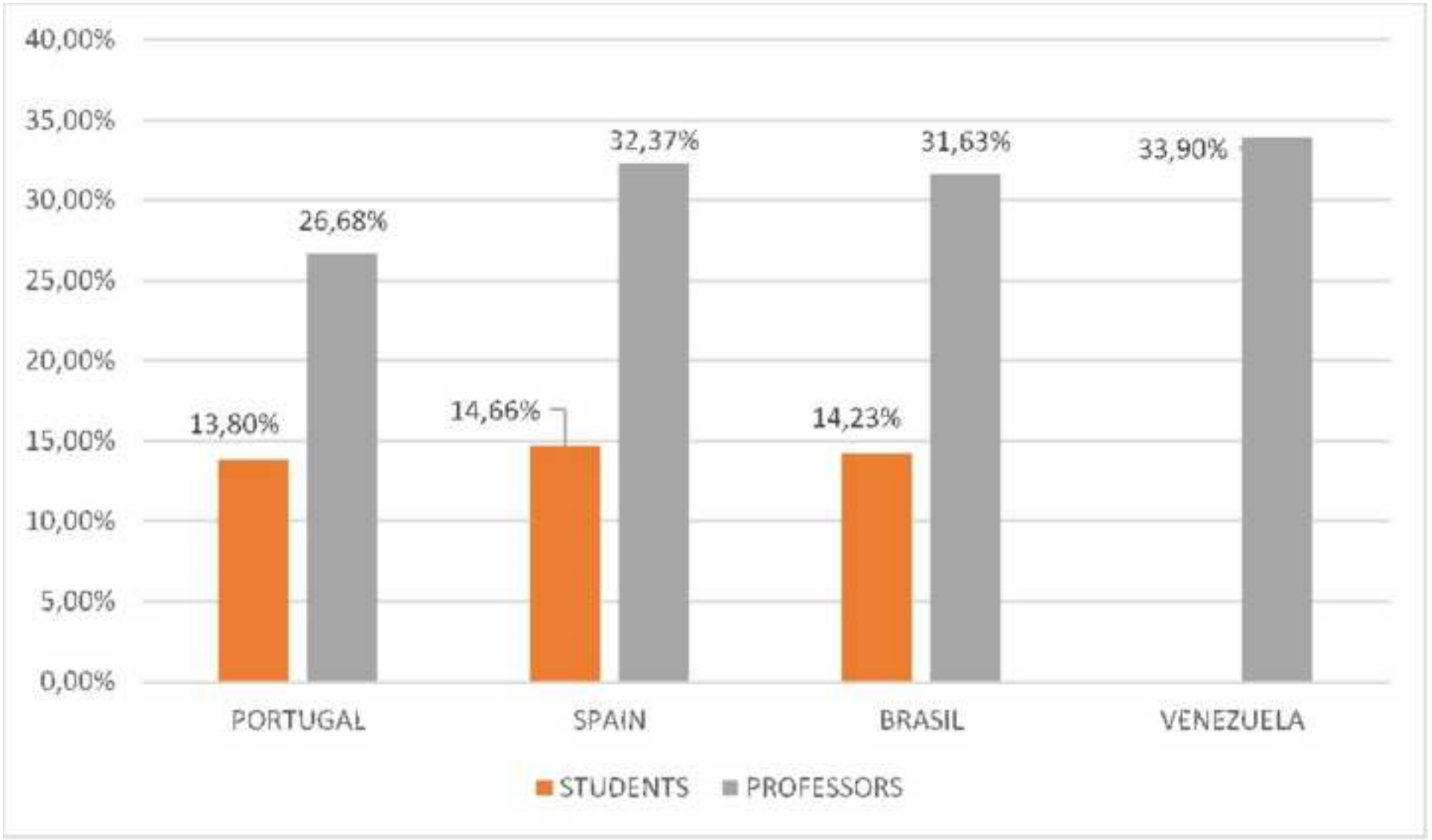

Figure 4. Dimension 4: Production and dissemination

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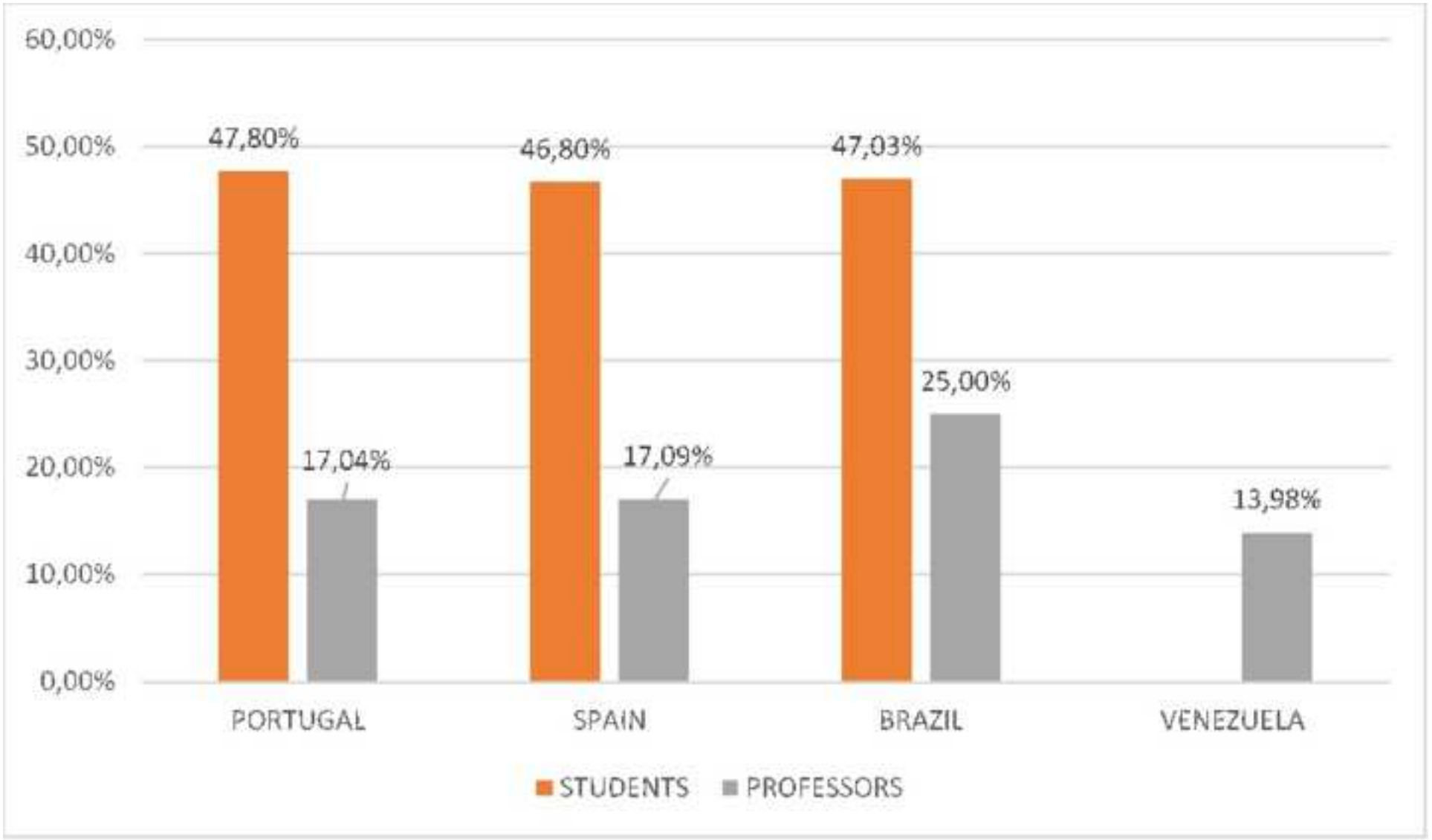

Figure 5. Dimension 5: Interaction

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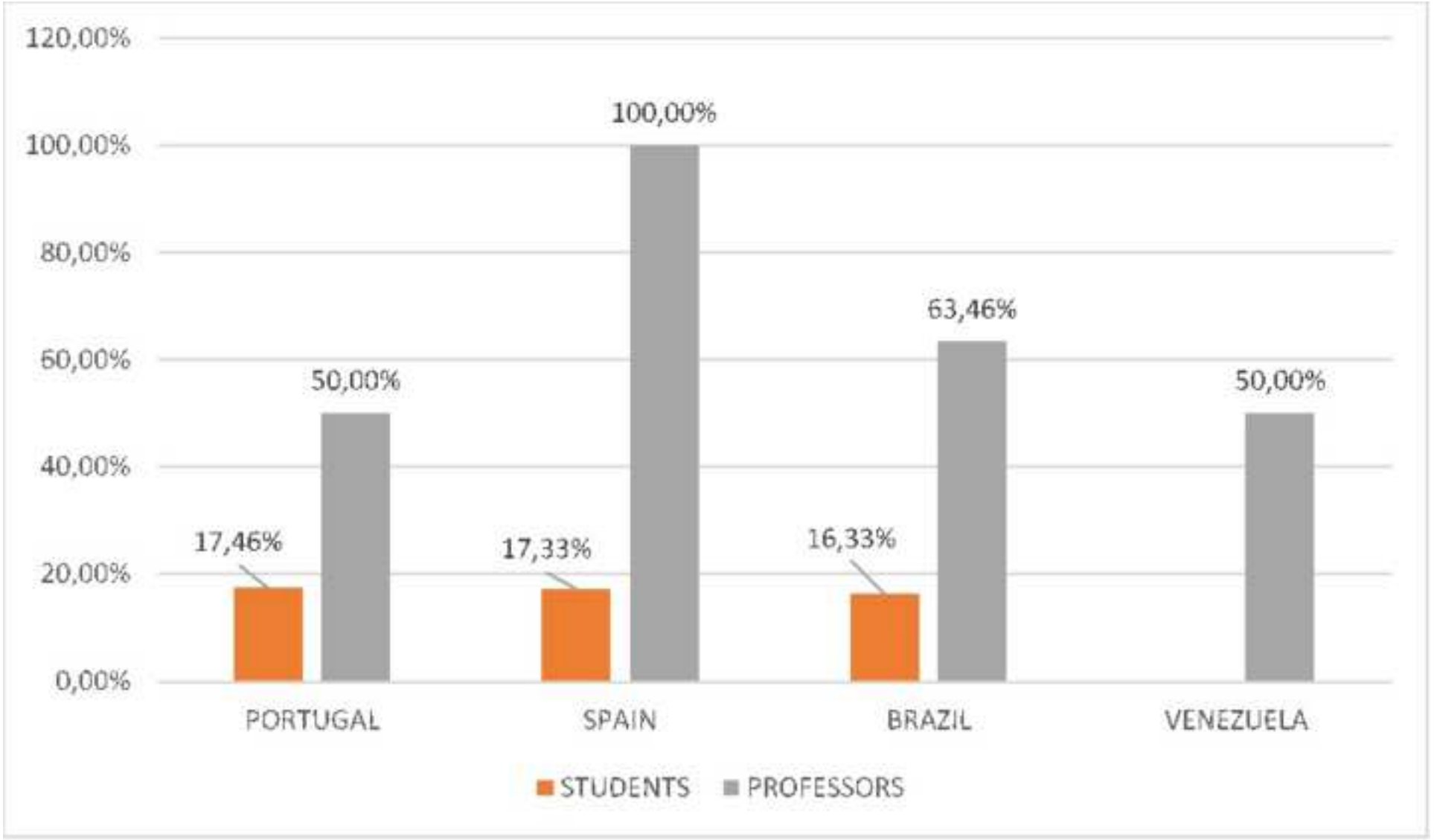

Figure 6. Dimension 6: Aesthetics

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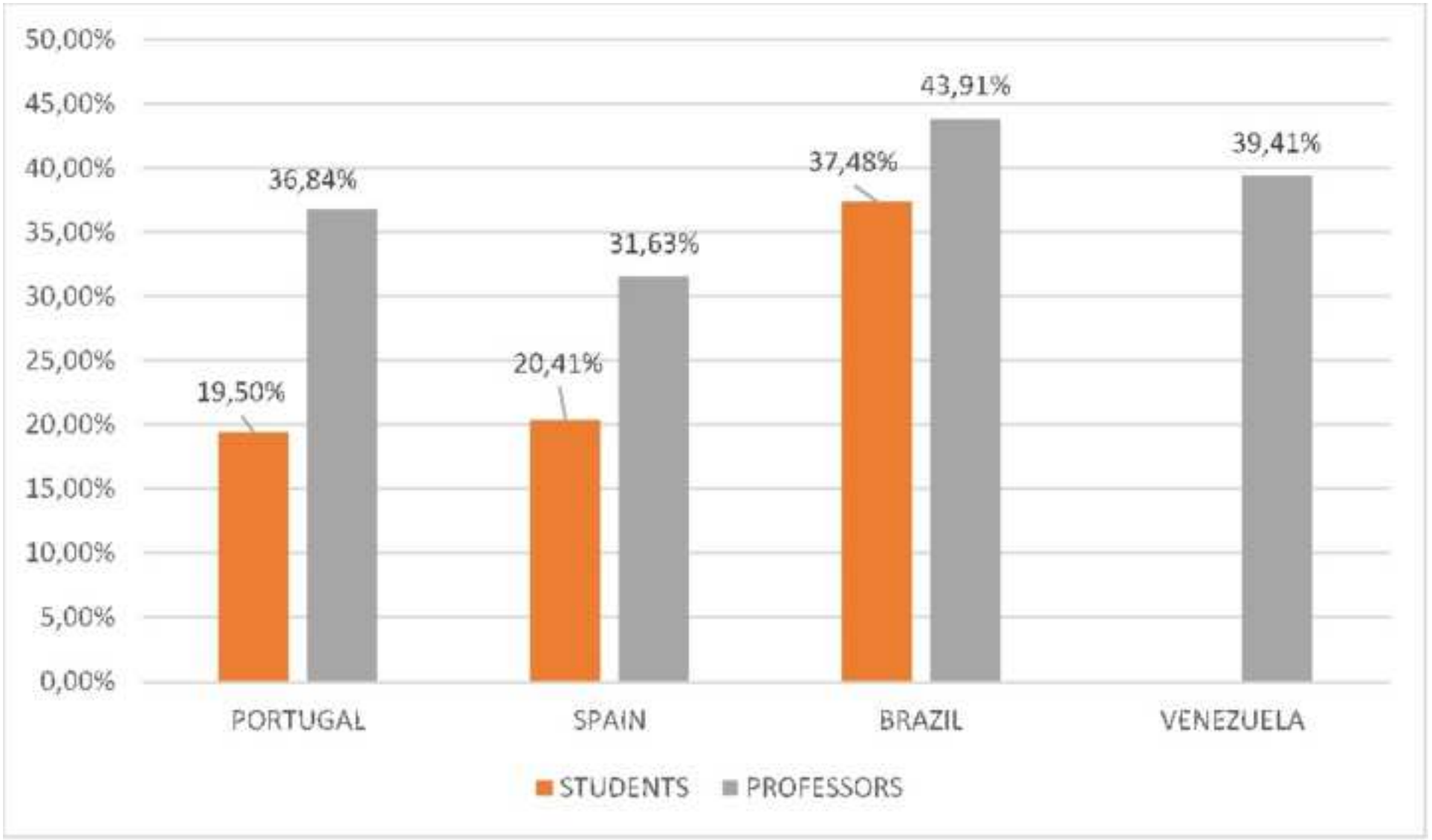

Figure 7. Dimension 7. “Responsibility and use of technologies in teaching; Dimension 8. “Use and knowledge of media and Interoperability”

Pulse aquí para acceder/descargar;Figure (Figuras);FIGURA 7-300DPI-TIFF.tiff

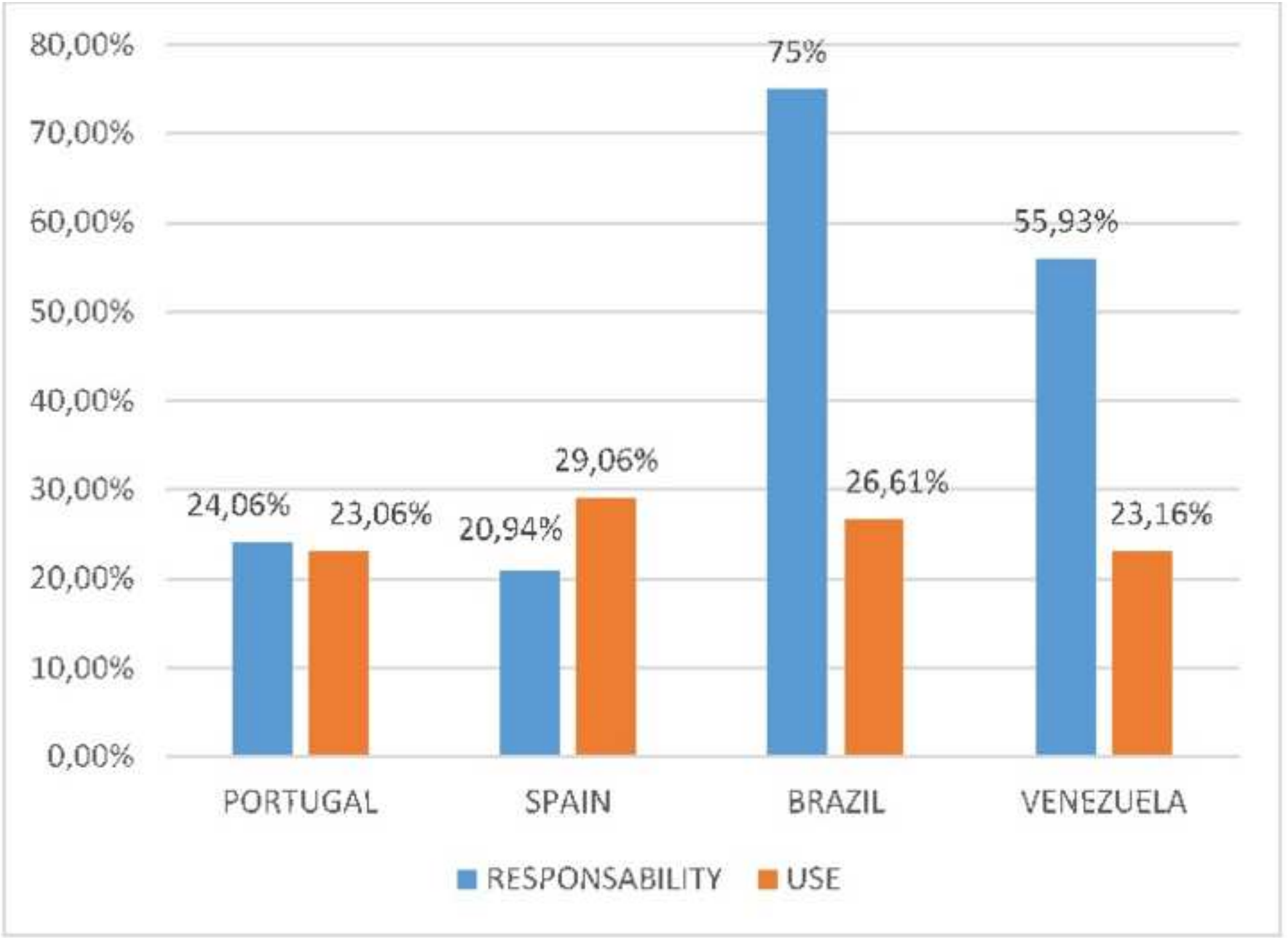

Figure 8. Infographics of results

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