MEDIA AND INFORMATION LITERACY (MIL) AND EMERGING METHODOLOGIES IN EARLY CHILDHOOD EDUCATION AND PRIMARY EDUCATION DEGREES IN ANDALUSIA

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Abstract

Since the 1980s, the growing consumption of media by various segments of the population has been of concern to education experts, who have warned of the need for teacher training to integrate Media and Information Literacy (MIL) in their curricula. In this article we analyse the curricular plans and teaching guides for subjects related to MIL in Early Childhood Education and Primary Education degrees in Andalusia. Through these documents, we seek to identify the presence of AMI in initial teacher training, its characteristics, potential and limits, as well as the emerging methodologies arising from the relationship between technology and education. In methodological terms, we conducted a quantitative analysis, using simple descriptive statistics, combined with a qualitative analysis, using the principles of content analysis, according to Bardin (1991). The data indicate that training for AMI is very uneven across the universities and courses analysed. Moreover, most of the subjects related to AMI are optional and deal mainly with aspects related to the presence of technology as a support for teaching, with little presence of emerging methodologies, which leads to a marginalisation of aesthetic training and critical training of future teachers for and with the media.

Keywords – Media and information literacy, Initial teacher education, Emerging methodologies, Higher education.

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1. Introduction

The advancement of the network society (Castells, 2006) in recent decades has triggered a series of social transformations, including in the field of education and teacher training (Moreno, 2020). This is because the contemporary communicational ecosystem has presented social problems, such as the growth of disinformation, the expansion of communication networks that stimulate terrorist acts, cyberbullying,

going from issues that touch on surveillance and trade of personal data on digital platforms to the ethical and political questioning of the agency of artificial intelligence in different spheres of life. Moreover, after the Covid-19 pandemic, in the years 2020 and 2021, the massive presence of Digital Information and Communication Technologies (DICTs) made itself felt in a dizzying way in educational institutions and in teaching performance.

Aware of the role that individuals and institutions engaged in education and communication can play in understanding and acting together with DICTs and the media on behalf of citizenship and social justice, manifestos and legal frameworks have emerged around the world. These are centred on the need for developing Media and Information Literacy (MIL) (Wilson, Grizzle, Tuazon, Akyempong & Cheung, 2011; Grizzle, Moore, Dezuanni, Asthana, Wilson, Banda et al., 2016; Buckingham, 2019; UNESCO, 2020) as a central pillar to the development of informed and participatory societies.

MIL, according to a 2011 UNESCO proposal (Wilson et al., 2011), is an area of education and research that encompasses the knowledge, skills and attitudes needed to use and interpret information and media content critically and creatively, including the abilities to critically understand media languages and messages and the contemporary media ecosystem, to create and share content from ethical principles of justice and responsible social development (Gutiérrez & Tyner, 2012; Cuervo-Sánchez, S., & Medrano-Samaniego, 2013; Buckingham, 2019; Amat, Piquer, Fabrés & Farné, 2022). This does not mean using the media to support the teaching of other subjects such as mathematics, geography, arts, etc. It means education aimed at teaching and learning about the media, understanding its role in society, its relevance in terms of social mobilisation and democratisation of information (Romero & Morante, 2023).

It involves, therefore, analysing the media themselves, unveiling the ways they represent reality and helping citizens to be more critical of the messages to which they are exposed. Moreover, it is also important to understand that the term "literacy" here presupposes literacy in a broader sense, not in a functional way, but as education for critical inclusiveness in the world, moving in the direction of the educational precepts of Freire and Macedo (1990). This new concept of literacy, related to the space-time of interaction, reception, production and sharing of messages in the communication system, is involved in six key media education competencies: comprehension, critical capacity, creativity, consumption, citizenship and intercultural communication (Frau-Miegs & Torrent, 2009).

Some publications related to the concept of MIL originally date back to the United Nations Educational, Scientific and Cultural Organisation (UNESCO) in the late 1970s and early 1980s (Maddison, Bennett, Kruger, Alvarado, Pedersen, Sirkka et al., 1977; UNESCO, 1982). In these early documents, the general idea of media education and its forms of representation and mediation of reality through technology was referred to as media studies or media education. For some authors (Buckingham, 2019; Mateus, Andrada & Ferrés, 2019), what we call MIL in this article is also known as media education. At the risk of oversimplification, in this paper the term "MIL" and "media education" are considered to be equivalent, even though there may be differences (Aguaded, Jaramillo-Dent & Delgado-Ponce, 2021) and further terminological precision is needed.

Those initial publications have since been taken up and ratified by that institution, especially since the popularisation of the Internet and the development of digital culture (Hjarvard, 2016). In terms of teacher training and the creation and implementation of curricular actions, UNESCO highlights the curriculum project called Media Education: a kit for teachers, students, parents and professionals (Frau-Meigs, 2007) launched in 2006, and subsequently the document named Media and Information Literacy: A Curriculum for Teachers, in 2011 (Wilson et al., 2011). The document showcases the importance of media and information literacy for teachers as a strategy for achieving a multiplier effect in society. According to Wilson et al., (2011), there have been several interesting contributions to this proposal, which are also promoted by UNESCO. Among them, the Alexandria Declaration of 2005 that identifies MIL and lifelong learning as essential for the development of the information society, and calls for its promotion among education professionals. Consideration could also be given to the 2007 Paris Agenda, which addresses different recommendations to strengthen the links between MIL, cultural

diversity and respect for human rights. Once more, reference is made to the integration of MIL in initial teacher training, in the development of pedagogical methods appropriate to their role, and in higher education research.

As a result, in recent years, other documents have emerged on the international scene that are more focused on the competences needed to handle digital technology, whether for informing, communicating, learning and producing knowledge in a digital and hyper-connected society. One example is the European Framework for the Digital Competence of Educators (Redecker & Punie, 2017), also called DigCompEdu, which was published by the European Commission in 2013 and revised in 2017. The latter document, although dedicated to the development of digital competences, according to Amat et al. (2022), is a document aligned with the proposals of MIL. For the authors, digital competency seems to be conceived as if it were a new competency, when in fact "what was new" at the time was technology, in this case, digital technology. Moreover, the approach to digital competencies, in some respects, could seem reductionist in relation to MIL, since it focuses on the instrumental aspects of ICT or on the mastery of digital competences that MIL already included and required in its proposals (Osuna-Acedo, Frau-Meigs & Marta-Lazo, 2018). For example, DigCompEdu does not consider knowledge of the different media languages, nor does it refer to the critical analysis of the content that arrives through digital media. Similarly, MIL does not mention digital security (Amat et al., 2022). Our position is that the development of digital competency should be considered within the framework of MIL, so that the mastery of certain digital competencies transcends the instrumental use of technology. Therefore, being able to add a critical and analytical vision for a more engaged and participatory citizenship, as expressed by González-Rivallo and Gutiérrez-Martín (2017).

As regards the Spanish context, DigcompEdu was translated and edited, in 2017, by the National Institute of Educational Technologies and Teacher Training (INTEF) for the Common Framework for Digital Teaching Competence. Likewise, the document *Integración de las competencias ALFIN/AMI en el sistema educativo: referencias, contexto y propuestas* (2016), by the Ministry of Education, Culture and Sport adds to the governmental efforts to promote MIL within the Spanish context.

Notwithstanding the growing concern for MIL in the world, in Spain, experts warn that the curricula of the current Bachelor's Degree in Early Childhood Education and the Bachelor's Degree in Primary Education, the Master's Degree in Compulsory Secondary Education and Baccalaureate, Vocational Training and Language Teaching, do not reflect these concerns, and contain few or almost no specific subjects on media education (Aguaded & Marzal-Felici, 2021). Ferrés, Masanet and Gómez (2015) conducted an extensive study in which they explored media education offered in university education and communication degrees throughout Spain, from the review of curricula and interviews with teachers to the specific analysis of the dimensions of media competence offered by university education. In their conclusions, the authors demonstrate that the inclusion of media education subjects is quite recent, and prioritises an instrumental approach linked to the use of the media as a didactic resource, to the detriment of others, such as training for aesthetic or critical appreciation, and about the interactions established in and with the media. They also point out that the training of most teachers of this subject has been mainly self-taught.

Despite the important contributions of this investigation, the study of media education in Spanish universities remains a challenge (Prats, 2020; Aguaded & Marzal-Felici, 2021), especially because changes continue to occur in the digital and communication culture, with new technical and social contours, such as the dizzying technological presence interjected in educational institutions during the COVID-19 pandemic. And, also, because it is necessary to study in depth the regional and local characteristics and specificities of the institutions, as well as the characteristics of each institution in order to ensure possibilities for improving university curricula in each of Spain's autonomous communities.

In this context, in addition to the technologies that are gradually being incorporated into the educational environment and teacher training, new forms of teaching are emerging as possibilities for renewing the contemporary educational scenario, usually related to MIL content. These are the so-called emerging

methodologies (Torres, Jácome, Tello, Benítez & Peneida, 2023; Villamarin-Reinoso, Lalaeo-Achachi, Guerrero-Semanate & Lozada-Arías, 2022), which are taking over the modes of educational interaction and socialisation, based on the relationship between digital culture and education.

For Torres et al. (2023), emerging methodologies refer to research and practice approaches that are emerging in response to the new challenges and opportunities of digital culture and that focus on student action in association with digital technologies. The aim of this partnership is to reposition the learner as the protagonist of educational action, encouraging participation, cooperation, autonomy and self-regulation in the teaching-learning process. Students, under the guidance of teachers and in interaction with the context of digital technologies, assume greater responsibility and autonomy in their learning process, reinforcing their sense of self-esteem, interest and motivation (Robledo, Fidalgo, Arias & Álvarez, 2015; Ballesta, Izquierdo & Romero, 2011).

Emergent methodologies have gained relevance in various areas, such as science, technology, education, business and health. They stand out for their emphasis on collaboration, interaction and constant adaptation, which makes them suitable for rapidly changing environments (Beck, 2001, González, Cabrera, Robles & Belmonte, 2020). Among the best known are the flipped classroom (Yarbro, Arfstrom, Mcknight & Mcknight, 2014; Solier-Castro, Guerrero-Alcedo, Sosa-Rojas, Espina-Romero, Diaz-Vallejos & Fernández-Celis, 2022; Quiroz-Saavedra, Ramírez-Fuentes, Gurruchaga-Costa, Reyes-Reyes & Marchant-Ahumada, 2022), design thinking (Brown, 2008; González-Granados, 2022; Barbosa-Quintero & Estupiñán-Ortiz, 2023), gamification (Deterding, Dixon, Khaled & Nacke, 2011; Prieto-Andreu, Gómez-Escalonilla-Torrijos & Said-Hung, 2022), and m-learning (Zambrano, 2009; Balanyà-Rebollo & de Oliveira, 2022; Araiza-Vazquez, Figueroa-Garza & Pedraza-Sánchez, 2023).

Based on this context, we investigate how the universities of the Andalusian autonomous community have planned and offered MIL in curricula, as well as its relationship with the development of emerging methodologies in the Early Childhood Education and Primary Education Degrees. The aim of this article is to reveal the characteristics, needs and shortcomings of MIL and emerging methodologies in the curricula and teaching guides in the aforementioned courses of the Andalusian universities, according to the specific subjects offered, directly and indirectly related to the subject.

To justify this choice, our starting point was the conviction that, in order to optimise the media education of citizens, it would be necessary to focus on the institutions and professionals who are in charge of this type of education, or those who have a direct impact on the participants of this training process. This assumption led us to focus on the university, the place where the future education professionals that will join the education systems are trained.

2. Methodology

To carry out the research, we used quantitative analysis, using simple descriptive statistics, combined with qualitative analysis, using the principles of content analysis, according to Bardin (1991).

As a criterion for selecting the institutions to be investigated, we chose the universities that comprise the Andalusian university system. So, we searched the website of the Andalusian Regional Government – Department of University, Research and Innovation – to find out which universities are part of its system, and came up with eleven universities, ten public and one private. As exclusion criteria, we eliminated from the study those institutions that did not offer degrees in Early Childhood Education and Primary Education. At the end of this first phase, nine universities were selected for the study, eight public and one private, namely: University of Almeria (UAL); University of Cadiz (UCA); University of Cordoba (UCO); University of Granada (UGR); University of Huelva (UHU); University of Jaen (UJA); University of Malaga (UMA); University of Seville (US); Loyola University (UL).

We also investigated the curricula of the nine Andalusian universities that provided data on the presence of specific subjects related to MIL, which allowed us to identify a list of subjects that were selected on the basis of their titles and the list of contents they offered. We checked whether the titles and contents

contained keywords or descriptors such as: media education, AMI/MIL, educommunication; technology(ies); ICT; TDIC; TAC; TEP; technological resources; computer resources; Educational Technology; Multimedia; education and image, visuality, audiovisual, radio, cinema, TV, press, internet, communication.

Finally, the teacher's guides were subjected to a thematic content analysis, as indicated by Bardin (1991), supported by the use of Atlas T.I. software version 23.2.2.27458; Content analysis (CA) is methodologically organised in three stages, according to Bardin (1991): i) Pre-analysis; ii) Exploration of the material; and iii) Processing of the results, inference and interpretation.

In the pre-analysis phase of our study, a careful reading of the teaching guides was carried out to identify the main issues. The exploration phase of the material allowed references through the coding process. This involves the recording of key words which indicate the nuclei of meaning relevant to the study and which are elaborated from the corpus or from a priori conceptual markers. The coding effort totalled 32 codes. Subsequently, the context in which each code was used, referred to in CA as context units, was checked. In ATLAS.ti, context units are called quotations. A total of 159 quotations were associated with the established codes. This made it possible to check the relationships that were established within the code to create categories. It was then possible to organise the codes into groups with a common core of meaning, which in the software are called family and constitute the categories of the analysis.

In this study, we used a priori categories, also called theoretical or deductive categories, taken from the article published by Ferrés and Piscitelli (2012), who defined a set of six dimensions that are divided into various specific indicators (37 indicators of analysis and 22 indicators of expression) to assess the degree of media competency. In order to make the data processing more effective, the data were grouped into the six dimensions proposed by Ferrés and Piscitelli (2012), adjusting them into simplified versions, without the use of specific indicators specified by the authors, which indicate characteristics of analysis and expression. The categorisation is as follows: (i) **Technology** – which corresponded to the instrumental use of ICT and media, i.e., for applied use and didactic support; (ii) **Languages** – relating to the specific characteristics of each media, their forms of narrative and symbolic mobilisation; (iii) **Production and Dissemination** – corresponding to the creation and development of content, the production of information by students, collaborative work based on the use of ICT; iv) **Ideology and Values** – which refers to ideological and social analysis of ICT and the content of mass media messages and digital culture products; v) **Reception and Interaction** – which refers to how consumers consume, appreciate and socialise media content or the forms of communicative interaction that are established through ICT. Finally, category vi) **Aesthetics** – which refers to education for sensitive appreciation and affective education, through the cultural and artistic products of mass media and digital culture.

3. Results

When we searched the websites of the Andalusian institutions for subjects related to MIL and their correlates (also considering, for example, Educational Technologies, Visual Culture subjects, etc.), we located a total of twenty-four (N=24) subjects, twelve (12) of them in the Early Childhood Education Degree and twelve (12) in the Primary Education Degree.

We found a relatively asymmetrical distribution of these curricular components in Andalusian universities. In Early Childhood Education, two universities do not offer any specific subjects on media education or educational technology, whereas only one institution concentrates six (6) subjects (50% of the total number of teaching guides for this degree) related to the use of Information and Communication Technologies or aspects of media education – most of them contained in a specific line of optional subjects called *Mención en Tecnologías de la Comunicación y la Información* (Mention in Communication and Information Technologies). The same is true for the Bachelor's Degree in Primary Education, where one institution does not offer any specific subject in media education or educational technology, and two institutions offer more than one subject. All the other institutions offer only one subject related to MIL in both degrees.

Furthermore, curricula are organised according to subject type: core subjects, compulsory subjects and optional subjects. Core subjects are general subjects in a field of knowledge and are not necessarily programme-specific. Compulsory subjects comprise the content and competencies specific to the degree programme. Elective subjects are chosen by the student from a list of subjects available in the curricula of the corresponding programmes. In the curricula analysed, most MIL-related subjects are electives (45%), although many degree programmes already offer them as core subjects (38%) and few (17%) as compulsory subjects (Figure 1).

Regarding the temporal distribution of these subjects in the curricula (Figure 2), we find that most of them are placed at the end of the degree programmes (45%), in the fourth and final year (4th year). In terms of workload, most (79%) of the subjects have a workload of six (6) ECTS (European Credit Transfer and Accumulation System) credits – corresponding to 150 hours. ECTS credits are the official unit of measurement of academic credits in the European university system and account for the amount of work a student has to do to fulfil the objectives of the study programme. The standard workload is 6-credit subjects, which correspond to most of the curricular subjects in the courses analysed. Only two institutions offer a higher workload in the subjects analysed, with 8 ECTS credits – equivalent to a workload of 200h – and three institutions offer lower workloads of 4 ECTS credits – equivalent to a workload of 80h.
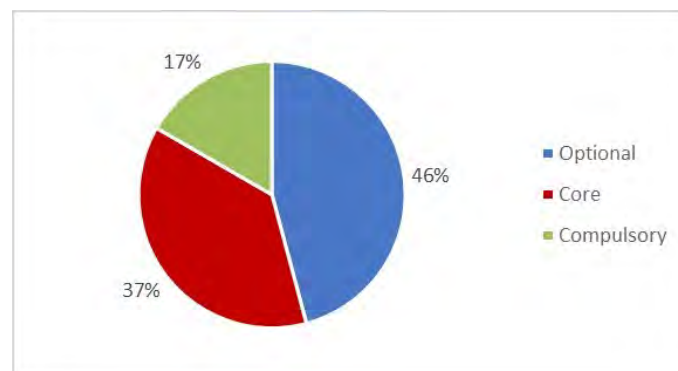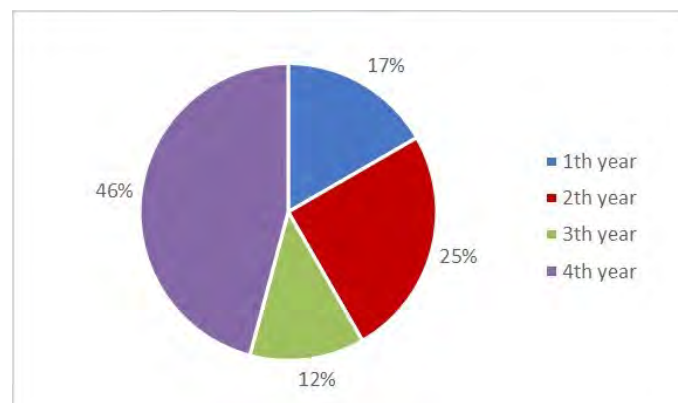

Figure 1. Subject Types

Figure 2. Annual Subject Distribution

With regard to teaching methods, i.e., methodological aspects and the presence of emerging methodologies (EMs), we find (Figure 3) that most subjects (42%) make no reference to EMs. Consequently, the subjects are taught preferably using more traditional teaching methods, with an emphasis on classes separated into "theoretical" modules, while other parts of the content are accomplished through individual or group study activities divided into workloads that the student may

engage in outside class hours. This theoretical-practical approach and the relationship between face-to-face and non-face-to-face workloads are detailed below.

Presently, looking at data about methodologies, it can be seen that around 21% of the teaching guides make some kind of reference to the fact that the classes will be characterised by activities inviting the students to act as protagonists, alluding to terms of the so-called active methodologies (AMs), such as: "it is understood that the students will participate and take the lead in the practical activities", or that "the methodology will be active and participatory on the part of the student." In these cases, the references are generally made to project-based pedagogy, and the guidelines use terms such as "the course proposes a practical project in which they can integrate technology." In these cases, however, there are no emerging methodologies directly related to digital and media culture, such as gamification or mobile learning. Instead, active methodologies that are somewhat more popular in teacher training (Jimeno-Hernández, González-Ortiz & Tornel-Abellán, 2020), such as cooperative work, project work, case studies, etc. In 17% of the cases, we found phrases indicating that students will learn about "new" or "current" methodologies, but there is no specification on what these methodologies may be. These were classified as vague allusions to the offering of EMs or AMs.

Only 12% of the subjects explicitly mention the use of emerging methodologies (EMs) in their teaching guides, citing *"flipped classroom"*, appearing 3 times; *"gamificacion"* (gamification), appearing 1 time; and *"m-learning"* (mobile learning), appearing 1 time. Finally, 8% of the guides analysed address emerging methodologies in the thematic blocks taught in the subject, that is, as study content for future teachers. And these are subjects exclusive to the Primary Education Degree, and there are no references to the thematic treatment of emerging methodologies as a subject of study in the Early Childhood Education Degrees in Andalusia.
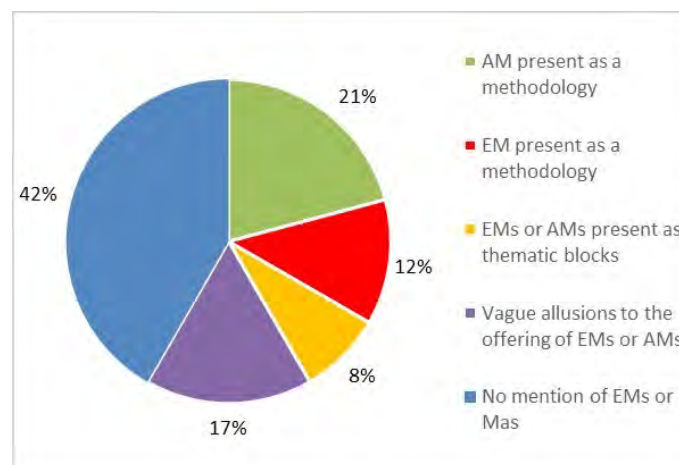

Figure 3. References to Emerging Methodologies in Teaching Guides

Conversely, all the subjects analysed are hybrids, where part of the teaching load is face-to-face and the other non-face-to-face, based on online classes and activities or dedicated to individual or group self-study. Most of the curricular components analysed (79%) dedicate between 26% and 45% of the workload to face-to-face activities, a time reserved to theoretical classes and practical activities performed in smaller groups – Figure 4. Only three subjects devote more than 50% of their workload to face-to-face activities, but they are optional. Another characteristic common to all the subjects analysed, as mentioned above, is the theoretical-practical approach. All the teaching guides analysed contemplate theoretical-practical actions or specific time for implementing practical activities using different ICTs, creating materials or teaching actions based on the use of technological resources and media.

With regard to the competences to be developed by future teachers, the data point at (Figure 5) the prevalence of Technology and Ideology and Values dimensions in the guides, as well as at a scarce emphasis on Languages, Production and Dissemination, Reception and Interaction. And there is almost

no reference to Aesthetics. In Early Childhood Education, the distribution of the dimensions indicates that the focus on knowledge and use of Technology is present in 83% of the documents analysed and in Primary Education in 92% of the documents. The analysis of the Ideology and Values in media messages exists in 75% of the Infant Education Guides and in 93% of the Primary Education corpus.

Conversely, indication to the development of competencies and learning outcomes related to the creation and dissemination of information and media content or the development of processes, materials and resources with ICT appears in slightly less than half (41%) of the guides for Pre-primary and Primary School Education. Media reception is only addressed in 16% of the teaching guides for Pre-school Education and 25% for Primary Education, while the offering of aesthetics training is only mentioned once in each course.
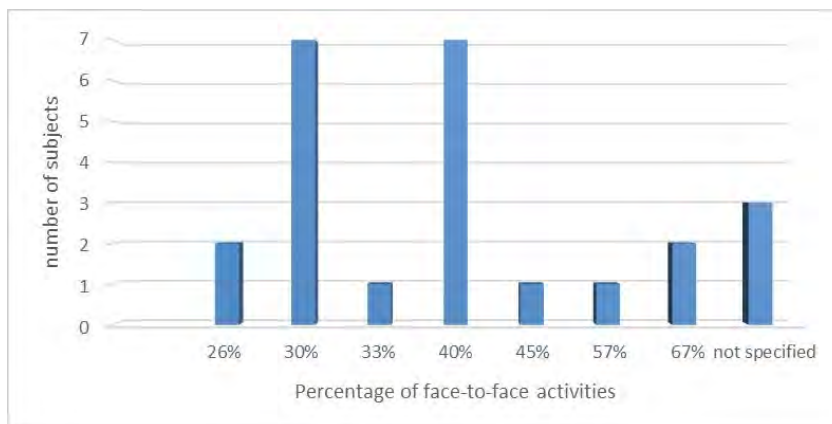

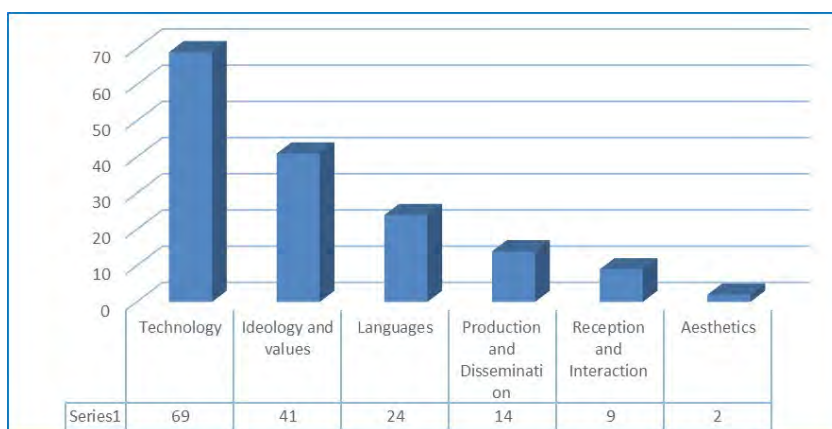Figure 4. Percentage of Face-to-Face Activities per Course

Figure 5. Volume of Quotations Referring to Media Dimension Type

4. Analysis and Discussion

The data show that the vast majority of university degrees in Early Childhood Education and Primary Education in Andalusia offer at least one curricular component focusing directly on IAM or related aspects. However, it is worrying that these subjects often occupy a peripheral place in the curriculum. After all, around 50% of the guides analysed are for optional subjects which are only offered at the end of the academic year. There is at least one public institution in Andalusia (Universidad Pablo de Olavide) that has been excluded from the analytical proposal of this article, because it does not offer a single subject on MIL in the courses analysed. Likewise, there are other universities that do not offer these components in any one of their courses and there are those where the offer is strictly optional. This implies that not all teachers trained by these institutions will have adequate media education competencies. In other words, in terms of training for developing MIL, and thus, for implementing a kind of education that agrees with the

challenges of the present and is oriented towards the future, the graduates from these institutions will be trained but not qualified.

Furthermore, the data also indicate that training for MIL is very uneven across universities and courses, showing courses where there is no specific curricular component on the subject, as well as courses where up to five corresponding curricular components are offered, albeit on an optional basis. This inequality in educational circuits is serious, since the greatest educational challenges in the contemporary world, according to UNESCO (2023), include issues like education quality, equity and inclusiveness, and education systems efficiency.

The report in question deals specifically with the challenges of technology in education, with a particular emphasis on its limits and critical factors. If there is inequality in the provision of curricular components that address MIL in teacher education, training institutions contribute to it being reproduced in school systems. As the UNESCO report (2023) points out, teachers who do not know how to deal with media and technology in terms of critical and creative media and information literacy tend not to work with technologies, media, their languages and representations in a way that favours digital citizenship and its challenges.

The inequality that exists among the teaching subjects analysed is also evident in terms of the media competencies that the university institutions have selected and emphasised. Although the teaching guides do not accurately represent what happens when the curriculum is actually implemented, and therefore, do not constitute the entire teacher training activity, it is also true that they are a material indication of what is held as educational values, or as an educational project. Thus, they specify the teleological sense of the curriculum that each teacher puts into practice.

As for the analysis of the methodologies adopted, the data show that, although some of the teaching guides mention "activity", "protagonism" and "student collaboration", invoking aspects of active methodologies (Asunción, 2019; Lobato & Madinabeitia, 2011) in the interaction with the planned contents, what is observed is that the emerging methodologies (EMs) more directly related to digital culture are practically non-existent in these subjects, neither as a teaching method used by the teaching staff, nor as an object of study offered to the students.

Another important finding is that the teaching guides analysed do not elucidate the thematisation of MIL's own methodologies centred on the development of processes of analysis of media products and information processes, or on the development of ethical and aesthetic modes of expression based on digital culture. References to MIL's own methodologies appear in the documents only indirectly, addressed mainly by the verbs "to analyse", associated with the media and their content, or with audiovisual content. Or they focus only on the possibilities of instrumental application of technologies, which is also the case when reference is made to emerging methodologies, with their different structures and formats (flipped classrooms, gamification, mobile learning).

It is paradoxical, since technologies and digital media are discursively addressed in the normative documents about global education, and the Spanish educational panorama, as relevant elements to update pedagogy in the face of the contemporary world and its future. However, most methods used for teaching these subjects echo the past, as they still maintain the fragmentation between theory and practice and high loads of "expository" activities.

The data on these methodologies are concerning, because only three (3) subjects assessed at all levels of Early Childhood Education and Primary Education in the Autonomous Community of Andalusia mention them in their teaching guides. In the case of Early Childhood Education, none of the subjects analysed have thematic blocks on emerging methodologies and two of them use these methodologies as a means of putting into action student activities involving technologies. As for Primary Education, only one subject in the teaching guide states that it uses inverted classroom methodology in its development, and four others use project-based pedagogy. Here, only two subjects describe emerging methodologies as

thematic content to be studied, highlighting mobile learning (*m-learning*) and "active methodologies for training with technology."

Despite this consistent lack of direct references to emerging methodologies and just a few references to active methodologies, it is possible to maintain that most of the methodological descriptions adopted refer to elements that point to methodological aspects that emphasise students as active players throughout the teaching-learning process; be it through the action of applied projects and large non-face-to-face workloads in which concepts such as self-training, collaborative training by means of online interactions or through digital platforms. However, it remains to be seen to what extent these activities have or have not contributed effectively to novice teacher trainees receiving continuous training to incorporate both the technologies and the teaching methodologies that arise in such context into their actual classroom work, once they have completed their courses.

Finally, with regard to media and information competences, the emphasis has been placed on technological competence, to the detriment of aesthetic, relational and creative training using digital technological resources and mass media. In other words, the approach specified by the institutions focuses on the knowledge and use of technological resources to support teaching. This is similar to what was pointed out by Ferrés et al. (2015) in their study of the Spanish system as a whole around a decade ago. For the authors, the incorporation of media education materials not only is quite recent, but comes from what has been historically known as "Educational Technology". It is not surprising, therefore, that an instrumental approach to the use of media is prioritised, or that the technological dimension is preferred to others, such as aesthetics, as stated by the authors.

However, if on the one hand this helps to explain the historical reason for this prevalence, on the other, it reveals that MIL remains predominantly rhetorical in the documents of institutions such as UNESCO and the European Parliament, and little more than legal compliance with what is required for teacher training curricula in Spanish universities and in many parts of the world today. This leads us to agree with Prats (2020: page 11) that teaching *for* and *with* technology in Spanish universities – and in this regard Andalusia once again mirrors the national scenario – is not the only way to achieve this goal, "we fall into what we could call technology fetishism: considering that technology alone guarantees communicative effectiveness, that it is enough to integrate technology to empower citizens."

If we analyse the other dimensions, the frequency of references (41% of the teaching guides) to Ideology and Values stands out. This category grouped together quotes like "to carry out a critical analysis of the messages", "to create critical awareness in teachers about new technologies; to know their social, cultural and ideological implications". The verbs most frequently used were "analyse" and "reflect". Also common to the Spanish university system, in addition to the emphasis on technological applicability, is the link between media education and critical thinking training (Ferrés, Masanet & Mateus, 2018; Prats, 2020). As these studies point out, critical thinking education is associated with reasoning, thought, rather than with attitudes, conduct, behaviour, or a critical stance towards and together with the media. The semantic analysis of the data shows that in 100% of the quotations in which codes or subcodes of the Ideology and Values category were used, the expressions used correspond to the cognitive semantic field and not to the attitudinal one.

Hence the importance of having teacher training institutions in Andalusia, as well as their agents, in order to assess whether the competencies and learning objectives related to the development of critical thinking are sufficient even without the adequate development of a critical attitude towards the media, or whether this would not imply a "toothless critique", to use the metaphor employed by Bauman (2006). At this point, it is important to address the idea of critical thinking education as formulated by the Brazilian pedagogue Freire (2000, 2014, 2017), as his principles constitute part of the basic principle underlying MIL in the UNESCO approach (Wilson et al., 2011). In Freire´s critical pedagogy, the crucial difference between critical thinking and action lies in the shift from understanding to practice engaged with reality. While critical thinking is the starting point, critical action is the subsequent step that empowers individuals to become agents of change in their own lives and in their communities. For Freire (2017), education in

general – and this applies to contemporary media education, according to Buckingham (2019) – is that which inspires not only reflection, but also transformative action.

Another aspect that stands out in relation to the descriptions of critical training for and with the media in the teachers' guides analysed is the strong link between critical analysis related to mass media and audiovisual content. However, there is an almost total absence of descriptors related to critical performance in digital culture and the new performativities emerging from this context, such as hoaxes and cyberbullying, economics, data mining and colonialism, among others that have more recently been brought up by international bodies (UNESCO, 2020). While media analysis focusing on mass media and audiovisual content remains relevant as an objective of MIL, it is also necessary to integrate this content into the contemporary media ecology and its constitutive features.

Similarly, the codes that delimit the Ideology and Values dimension, as well as Reception and Interaction, do not refer to self-criticism, only to heterocriticism (learning to criticise messages, products, information or news, among others). Therefore, the documents show that there may not be space for teacher trainees to exercise their media and information consumption practices, or for moments of dialogue and reflection between the social practices established between them as future teachers and the media ecosystem to which they are linked. Consequently, issues related to the production of identity and teaching identity in digital culture, as well as the feeling of belonging (Martín-Barbero, 2014) to digital culture, do not seem to be among the priorities expressed in the documents analysed.

As far as the Language dimension is concerned, we note that it is presented in a limited way. In quantitative terms, its frequency in the teaching guides is only 15%. In qualitative terms, this dimension is mainly associated with codes such as "television language", "cinema" or "audiovisual". Given that "audiovisual" is an adjective, the teaching guides do not specify exactly what type of audiovisual they are referring to, which makes it difficult to understand what exactly they are talking about in terms of this specific jargon.

Finally, the absence of codes associated with the Aesthetic dimension once again alludes to a similarity with the findings of Ferrés et al. (2015), the most marginalised. As Prats (2020) points out, this implies that someone may be considered competent in the media without displaying any capacity linked to sensitivity and artistic and creative appreciation. After all, it is through awareness of the world's dramas, including those of the techno-world or contemporary media ecology, that action and reflection on and with the media universe can be achieved.

Despite the similarities with the nationwide context identified by Ferrés et al. (2015), as well as the observation of the absences highlighted in this discussion, it is also possible to say that within the disciplines analysed there are institutions and subjects that stand out in terms of the powerful educational media they possess. After all, although exceptionally, some institutions and university subjects presented teaching guides that were strongly committed to the premises of MIL, covering all the media competences analysed, presenting a coherent relationship between these and the contents and activities planned, as well as in their assessment processes.

5. Final Considerations

This study has found data that show that media and information education in Andalusian universities is only minimally integrated into the curricular proposals of Bachelor's Degrees in Early Childhood and Primary Education. However, this integration is extremely uneven across institutions, as not all courses include this kind of training, and in a large part of the curricula it occupies a marginal position, usually among the optional subjects and in the final year. Unlike in other parts of the world (Livingstone, 2018; Buckingham, 2019; Kellner & Share, 2019), the organisational characteristic of these curricular components in Andalusia, for the most part, does not seem to be based on the development of a critical and creative body of knowledge in relation to media content and narratives (traditional or even digital culture), nor on any concern for their effects on sociability and digital citizenship, but instead on the need to integrate technology into Primary Education curricula.

However, given the centrality of the phenomenon of communication, and its presence and mediation by digital culture, it should be a subject matter of absolute importance in teacher training curricula (UNESCO, 2023). Firstly, because according to legal requirements (European Parliament, 2008), primary and secondary schools are obliged to do so, and therefore teachers at these educational levels must be prepared for the challenge. Secondly, because the degree of media competence of Spanish citizens in recent decades has not been exemplary in the world (Aguaded & Cruz-Díaz, 2014). Finally, because teachers in different parts of the world, including Spanish teachers (Rodríguez, Rodríguez & Arias, 2020), have shown deficiencies in their media training and low levels of media competence.

In this sense, when we look at the teaching guides and course plans, we realise that in the Andalusian context, like in the Spanish overall context, there seems to be, still, a deeply rooted use of technology as didactic support rather than as a communicative, cultural and political phenomenon of our time. The corpus analysed leaves no room for doubting that the work developed in these subjects still requires students to apply practical skills in a digital medium or application and to use it in didactic situations. Features mentioning critical thinking in media and information education aimed at the development of active communicative behaviours to promote digital citizenship and ethics based on sharing and production of socially relevant content (Buckingham, 2019; Castañeda, Esteve & Adell, 2018; Feltrero, Hernando & Acosta-Sznajderman, 2023) are scarcely described in the teaching guides. Moreover, when they are mentioned, these features are almost always focused on "audiovisual" content or "mass media ideology". Although we recognise that audiovisual contents are extremely relevant in contemporary media ecology, in the documents analysed they are associated with mass media, such as television and cinema. We must acknowledge that in the structure of networked communication, audiovisual contents expand beyond the classical forms of mass media representation and that the current communicative ecosystem is also consolidated on the basis of new configurations resulting from datification, platforming and algorithmic performativities of communication (Guerra, 2023), which scarcely appear, or not at all, in the teaching guides analysed and, consequently, in the current training of Andalusian teachers.

In short, our data show, firstly, that the MIL model adopted in Bachelor's Degrees in Early Childhood and Primary Education at the universities investigated does not explicitly start from a model of critical or holistic technological training and implicitly reduces the role of curricular components to training for classroom work, ignoring aspects such as the social and political training of teachers or the role of the school in community development through communication and digital culture. Secondly, the teaching guides are based on an instrumentalist view of technology as a value-neutral tool and do little to explore the relationship between technology and society. Moreover, when the teaching guides analysed mention MIL, they seem to start from a taxonomic view of the concept of media or digital competences, ignoring the complexity of MIL in terms of the different contexts in which these competences can be put into action, in terms of aesthetic training, the interaction between youth culture and school culture, as well as the role of technology and media in the construction of the teacher's identity.

As regards the teaching of these subjects, we tried to see if emerging methodologies (EMs) arising from the context of digital culture and technologies were present in the MIL environment. Among the results, we found few references to emerging methodologies (EMs) derived from the digital culture, such as the flipped classroom, gamification, mobile learning, and only a few allusions to active methodologies (AM), particularly those that evoke the centrality of the student, their autonomy and their agency and experimentalism in the educational process (Asunción, 2019; Lobato & Madinabeitia, 2011). However, this is a scant presence that does not seem to help students to innovate using the learning technologies they are subjected to in terms of innovative pedagogy, i.e., they are not developers of intelligent and interesting designs to associate the technological with the pedagogical.

Finally, we also believe that this study has limitations in its approach to teaching guides and curricula, in the sense that these documents merely point at the values and educational practices expected for teacher training, but that do not necessarily reflect reality or what takes place in the teaching action field. Therefore, it is important to conduct more studies, especially *immersive* ones, ethnographic and collaborative studies with

the teachers who teach these subjects; studies based on observation of their classes, as well as on research focused on teachers' and students' narratives about their practices and experiences vis-à-vis these curricular components, also based on attentive and in-depth listening to these agents, in order to effectively delve into the curriculum as it is put into practice and not just an idealised curriculum.

Based on our research, we consider that there is still an important challenge regarding the training of teachers of Infant and Primary Education in Andalusia, if we are to address the intersection between communication and education based on parameters that integrate technological appropriation in a more or less equitable way in terms of its aesthetic, creative, political, ideological and pedagogical potential. Thus, we realise that it is necessary to move from a technonormative to a technopoietic model of media and information literacy training. That is to say, rather than focusing on a technological approach, with too much emphasis on the technologies of the moment or "fashionable" ones, the subjects dedicated to MIL or technological appropriation in teacher training courses should focus on modes of production and affective-creative appreciation, and of critical understanding and interaction with the media.

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References

Aguaded, I., Jaramillo-Dent, D., & Delgado-Ponce, Á. (2021). *Currículum Alfamed de formación de profesores en educación mediática MIL (Media and Information Literacy) en la era pos-COVID-19*. Octaedro

Aguaded, I., & Marzal-Felici, J. (2021). *La Educomunicación en España: Un reto urgente para la sociedad digital*. Edu-comunicaciones.es. Available at: https://www.edu-comunicacion.es/declaracion/

Aguaded, I., & Cruz-Díaz, R. (2014). O grau de competencia em comunicação audiovisual entre os cidadãos da Andaluzia (Espanha). *Comunicação & Educação*, 19(1), 67-72. https://doi.org/10.11606/issn.2316-9125.v19i1p67-72

Amat, A., Piquer, M., Fabrés, G., & Farné, A. (2022). La alfabetización mediática e informacional en la educación formal: un reto necesario. *Espejo De Monografías De Comunicación Social*, 9, 13-33. https://doi.org/10.52495/c1.emcs.9.p95

Araiza-Vázquez, M.J., Figueroa-Garza, F.G., & Pedraza-Sánchez, E.Y. (2023). Estimación del rendimiento de los estudiantes en una experiencia de aprendizaje móvil. *Formación Universitaria*, 16(1), 33-44. https://doi.org/10.4067/s0718-50062023000100033

Asunción, S. (2019). Metodologías Activas: Herramientas para el empoderamiento docente. *Revista Docentes 2.0*, 7(1), 65-80. https://doi.org/10.37843/rted.v7i1.27

Balanyà-Rebollo, J., & de Oliveira, J.M. (2022). Los elementos didácticos del aprendizaje móvil: condiciones en que el uso de la tecnología puede apoyar los procesos de enseñanza y aprendizaje. *Edutec Revista Electrónica de Tecnología Educativa*, 80. https://doi.org/10.21556/edutec.2022.80.2415

Ballesta, F., Izquierdo, T., & Romero, B. (2011). Percepción del alumnado de Pedagogía ante el uso de metodologías activas. *Educatio Siglo XXI*, 29(2), 353-368. Available at: https://revistas.um.es/educatio/article/view/133101

Barbosa-Quintero, G.M., & Estupiñán-Ortiz, B.L. (2023). La metodología activa Design Thinking para mejorar y transformar los procesos de enseñanza y aprendizaje. *Ibero-American Journal of Education & Society Research*, 3(1), 74-82. https://doi.org/10.56183/iberoeds.v3i1.600

Bardin, L. (1991). *Análisis de contenido* (89). Ediciones Akal.

Bauman, Z. (2006). *Modernidad líquida*. Fondo de Cultura Económica.

Beck, K. (2001). *Manifesto for Agile Software Development*. Agile Alliance.

Brown, T. (2008). Design Thinking. *Harvard Business Review*, 86(6), 84-92. Available at: https://readings.design/PDF/Tim%20Brown,%20Design%20Thinking.pdf

Buckingham, D. (2019). *The media education manifesto*. John Wiley & Sons.

Castañeda, L., Esteve, F., & Adell, J. (2018). ¿Por qué es necesario repensar la competencia docente para el mundo digital? *Revista de Educación a Distancia (RED)*, 18(56). Available at: https://revistas.um.es/red/article/view/321581

Castells, M. (2006). *La sociedad red: una visión global*. Alianza Editorial.

Cuervo-Sánchez, S., & Medrano-Samaniego, C. (2013). Alfabetizar en los medios de comunicación: más allá del desarrollo de competencias. Teoría de la Educación. *Revista Interuniversitaria*, 25(2), 111-131. Available at: https://revistas.usal.es/tres/index.php/1130-3743/article/view/11577/11997

Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: defining "gamification". In *Proceedings of the 15th international academic MindTrek conference: Envisioning future media environments* (9-15). https://doi.org/10.1145/2181037.2181040

European Parliament (2008). *Resolución del Parlamento Europeo de 16 de diciembre de 2008*. *Alfabetización de los medios de comunicación en un mundo digital*. Europa.eu. Available at: https://www.europarl.europa.eu/doceo/document/TA-6-2008-0598_ES.pdf

Feltrero, R., Hernando, S., & Acosta-Sznajderman, L. (2023). Educomunicación contra las fake news: una experiencia en Smooc para el desarrollo de la alfabetización mediática crítica. *Revista Mediterránea de Comunicación*, 14(2), 181-194. https://doi.org/10.14198/MEDCOM.24635

Ferrés, J., & Piscitelli, A. (2012). La competencia mediática: propuesta articulada de dimensiones e indicadores. *Comunicar*, 19(38), 75-82. https://doi.org/10.3916/C38-2012-02-08

Ferrés, J., Masanet, M., & Gómez, M. (2015). *La educación mediática en la universidad española*. Gedisa.

Ferrés, J., Masanet, M., & Mateus, J. (2018). Three paradoxes in the approach to educational technology in the education studies of the Spanish universities. *International Journal of Educational Technology in Higher Education*, 15(1), 1-14. https://doi.org/10.1186/s41239-018-0097-y

Frau-Meigs, D. (2007). *Media Education: A Kit for Teachers, Students, Parents, and Professionals*. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000149278

Frau-Meigs, D., & Torrent, J. (2009). Políticas de educación en medios: Hacia una propuesta global. *Comunicar*, 32, 10-14. https://doi.org/10.3916/c32-2009-01-001

Freire, P. (2000). *Pedagogía del oprimido*. WW Norton & Company.

Freire, P. (2014). *La educación como práctica de la libertad*. Siglo XXI.

Freire, P. (2017). *Pedagogía de la esperanza: un reencuentro con la pedagogía del oprimido*. Siglo XXI.

Freire, P., & Macedo, D. (1990). *Alfabetização: leitura do mundo, leitura da palavra*. Paz e Terra.

González, M.E.P., Cabrera, A.F., Robles, A.S., & Belmonte, J.L. (2020). *Metodologías emergentes para la innovación en la práctica docente*. Ediciones Octaedro.

González-Granados, J.E. (2022). Pensamiento de diseño como agente de transformación en los procesos formativos. *Kepes*, 19(26), 633-672. https://doi.org/10.17151/kepes.2022.19.26.20

González-Rivallo, R., & Gutiérrez-Martín, A. (2017). Competencias mediática y digital del profesorado e integración curricular de las tecnologías digitales. *Revista Fuentes,* 19(2), 57-67. Available at: https://revistascientificas.us.es/index.php/fuentes/article/view/4028

Grizzle, A., Moore, P., Dezuanni, M., Asthana, S., Wilson, C., Banda, F. et al. (2016). *Alfabetização midiática e informacional: diretrizes para a formulação de políticas e estratégias*. UNESCO. Available at: https://unesdoc.unesco.org/ark:/48223/pf0000246421/PDF/246421por.pdf.multi

Guerra, P.C. (2023). Gobernanza algorítmica, explicación por diseño y justicia por diseño. *Anales de la Cátedra Francisco Suárez*, 57. https://doi.org/10.30827/acfs.v57i.25976

Gutiérrez, A. & Tyner, K. (2012). Educación para los medios, alfabetización mediática y competencia digital. *Comunicar*, 19, 38, 31-39. https://doi.org/10.3916/C38-2012-02-03

Hjarvard, S. (2016). Mediatización: La lógica mediática de las dinámicas cambiantes de la interacción social. *La Trama de la Comunicación*, 20(1), 235-252. Available at: http://www.scielo.org.ar/scielo.php?script=sci_arttext&pid=S1668-56282016000100013

Jiménez-Hernández, D., González-Ortiz, J.J., & Tornel-Abellán, M. (2020). Metodologías activas en la universidad y su relación con los enfoques de enseñanza. *Profesorado, Revista de currículum y formación del profesorado*, 24(1), 76-94. https://doi.org/10.30827/profesorado.v24i1.8173

Kellner, D., & Share, J. (2019). *The critical media literacy guide: engaging media and transforming education*. Brill Sense.

Livingstone, S. (2018). *Youth, new media, and the politics of learning*. Fictitious Publishing.

Lobato, C., & Madinabeitia, A. (2011). Perfiles Motivacionales del Profesorado ante la Formación en Metodologías Activas en la Universidad. *Formación universitaria*, 4(1), 37-48. https://doi.org/10.4067/S0718-50062011000100006

Maddison, J., Bennett, S., Kruger, G., Alvarado, M., Pedersen, J., Sirkka, M. et al. (1977). *Media studies in education*. UNESCO. Available at: https://unesdoc.unesco.org/ark:/48223/pf0000023803

Martín-Barbero, J. (2014). Pensar la comunicación en Latinoamérica. *Redes.com: Revista de Estudios para el Desarrollo Social de la Comunicación*, 10, 21-39. Available at: https://plataformarevistascomunicacion.org/2014/12/pensar-la-comunicacion-en-latinoamerica/

Mateus, J.-C., Andrada, P., & Ferrés, J. (2019). Evaluar la competencia mediática: una aproximación crítica desde las perspectivas pedagógica, política y metodológica. *Revista De Comunicación*, 18(2), 287-301. https://doi.org/10.26441/RC18.2-2019-A14

Moreno, H. (2020). Aprender y enseñar en la cultura digital. *Revista Iberoamericana de Tecnología en Educación y Educación en Tecnología*, 25, e11. https://doi.org/10.24215/18509959.25.e11

Osuna-Acedo, S., Frau-Meigs, D., & Marta-Lazo, C. (2018). Educación Mediática y Formación del Profesorado. Educomunicación más allá de la Alfabetización Digital. *Revista Interuniversitaria de Formación del Profesorado*, 9(32.1). Available at: https://www.redalyc.org/journal/274/27454937003/html/

Prats, J. (2020). Grandes carencias de la educación mediática. *Temas de comunicación*, 41, 8-18. Available at: https://revistasenlinea.saber.ucab.edu.ve/index.php/temas/article/view/4726

Prieto-Andreu, J.M., Gómez-Escalonilla-Torrijos, J.D., & Said-Hung, E. (2022). Gamificación, motivación y rendimiento en educación: Una revisión sistemática. *Revista Electrónica Educare*, 26(1), 1-23. https://doi.org/10.15359/ree.26-1.14

Quiroz-Saavedra, R., Ramírez-Fuentes, T., Gurruchaga-Costa, J., Reyes-Reyes, F., & Marchant-Ahumada, N. (2022). Evaluación exploratoria de la participación de estudiantes universitarios en Clase Invertida en modalidad en línea. *Revista de estudios y experiencias en educación*, 21(47), 133-148. https://doi.org/10.21703/0718-5162202202102147007

Redecker, C., & Punie, Y. (2017). *European framework for the digital competence of educators: DigCompEdu*. Publications Office of the European Union. https://data.europa.eu/doi/10.2760/159770

Robledo, P., Fidalgo, R., Arias, O., & Álvarez, M. (2015). Percepción de los estudiantes sobre el desarrollo de competencias a través de diferentes metodologías activas. *Revista de Investigación Educativa*, 33(2), 369-383. https://doi.org/10.6018/rie.33.2.201381

Rodríguez, Á., Rodríguez, J., & Arias, E. (2020). El profesorado universitario novel en schock: Propuestas de mejora. Revisión sistemática. *Revista Educare*, 24(1), 245-269. https://doi.org/10.46498/reduipb.v24i1.1245

Romero, W., & Morante, C. (2023). Retos actuales de la alfabetización mediática y tendencias para la formulación de propuestas pedagógicas: Una revisión bibliográfica. *Academia y virtualidad*, 16(1), 49-67. https://doi.org/10.18359/ravi.5748

Solier-Castro, Y., Guerrero-Alcedo, J.M., Sosa-Rojas, H.M., Espina-Romero, L.C., Diaz-Vallejos, D.N., & Fernández-Celis, M. (2022). Aula invertida en la educación superior: implicaciones y retos. *Horizontes. Revista de Investigación en Ciencias de la Educación*, 6(25), 1443-1453. https://doi.org/10.33996/revistahorizontes.v6i25.425

Torres, Á.F.R., Jácome, D.C.B., Tello, N.B.F., Benítez, E.P.A., & Peneida, L.E.C. (2023). Metodologías emergentes para la enseñanza universitaria. *Domino de las Ciencias*, *9*(3), 1155-1178. https://doi.org/10.23857/dc.v9i3.3493

UNESCO (1982). *Grünwald declaration on media education*. UNESCO. Available at: https://bit.ly/3GnPMnP

UNESCO (2020). *Seoul declaration on media and information literacy for everyone and by everyone: A defence against disinfodemics preamble*. (2020). Unesco. Available at: https://en.unesco.org/sites/default/files/seoul_declaration_mil_disinfodemic_en.pdf

UNESCO (2023). *Resumen del Informe de seguimiento de la educación en el mundo 2023: Tecnología en la educación: ¿Una herramienta en los términos de quién?* GEM Report UNESCO. https://doi.org/10.54676/BSEH4562

Villamarín-Reinoso, J.V., Lalaeo-Achachi, D.F., Guerrero-Semanate, N.F., & Lozada-Arías, B.N. (2022). Tecnologías emergentes (TEs) en el contexto del surgimiento de pedagogías para fortalecer el aprendizaje en la Educación Superior. *Dominio de las Ciencias*, 8(2), 1417-1433. https://doi.org/10.23857/dc.v8i2.2713

Wilson, C., Grizzle, A., Tuazon, R., Akyempong, K., & Cheung, C.K. (2011). *Alfabetización mediática e informacional: Curriculum para para profesores*. UNESCO. Available at: https://bit.ly/2UKHJcG

Yarbro, J., Arfstrom, K., Mcknight, K., & Mcknight, P. (2014). *Extension of a review of flipped learning*. Flipped Learning. Available at: https://flippedlearning.org/wp-content/uploads/2016/07/Extension-of-FLipped-Learning-LIt-Review-June-2014.pdf

Zambrano, J. (2009). Aprendizaje móvil (m-learning). *Inventum*, 4(7), 38-41. https://doi.org/10.26620/uniminuto.inventum.4.7.2009.38-41