OmniaScience

Journal of Technology and Science Education
JOTSE, 2023 – 13(2): 514-531 – Online ISSN: 2013-6374 – Print ISSN: 2014-5349
https://doi.org/10.3926/jotse.1746

MEDIA AND INFORMATION LITERACY IN SECONDARY STUDENTS: DIAGNOSIS AND ASSESSMENT

Osbaldo Turpo-Gebera[1], Mercedes Zea-Urviola[1], Fátima Huamaní-Portilla[1], Milagros Girón-Pizarro[1], Alexandra Pérez-Zea[1], Ignacio Aguaded-Gómez[2]

[1]Universidad Nacional de San Agustín de Arequipa (Peru)
[2]Universidad de Huelva (Spain)

oturpo@unsa.edu.pe, mzeau@unsa.edu.pe, ehuamanipo@unsa.edu.pe, mgironp@unsa.edu.pe, aperezz@unsa.edu.pe, aguaded@uhu.es

Received May 2022
Accepted August 2022

Abstract

In the information and knowledge society, technology and the COVID-19 pandemic have added to the debate on Media and Information Literacy (MIL). In Peru, in spite of the recommendations from international institutions, proper attention has not been given, generating gaps in the study curricula. From this perspective, the study investigates the level of development of MIL in students studying the last cycle of intermediate education. In order to determine this, the AMI-Peru-21 surv-ey was designed and validated, based on the UNESCO proposals. This research is of a quantitative, descriptive and cross-curricular nature, which made it possible to diagnose the relationship of the socioformative factors with the levels of MIL achievement, based on a sample made up by 1250 students from the province of Arequipa. The results evidence the validity and reliability of the instrument (α=0.96) in order to measure the level of MIL, from the perspective of student self-perception, as well as the association of certain socioformative factors with MIL ($p<0.000$), among them, progress with age, i.e., older ages are associated with greater the levels of achievement, and females make more progress than males. It is also verified that access to basic services, such as electricity and the Internet, and the type of educational institution are correlated with higher levels of MIL achievement. From the evidence that is generated, in order to ensure the education of critical, ethical and responsible citizens, a set of initiatives is suggested to further the evolution of MIL in education.

Keywords **–** Media education, Information literacy, Digital competences, Curriculum, Secondary education.

To cite this article:

Turpo-Gebera, O., Zea-Urviola, M., Huamaní-Portilla, F., Girón-Pizarro, M., Pérez-Zea, A., & Aguaded-Gómez, I. (2023). Media and information literacy in secondary students: Diagnosis and assessment. *Journal of Technology and Science Education,* 13(2), 514-531. https://doi.org/10.3926/jotse.1746

---

1. Introduction

In today's information and knowledge society (IKS), communication, like education and technology, is essential in the deployment of digital literacy. In this way, it becomes possible to assume the challenges

when building an inclusive society together. The informational, media and digital competences contribute in a significant manner to this resolve. From this perspective, the Information and Communication Technologies (ICTs) and Media and Information Literacy (MIL) contribute to the education of responsible, critical and decent citizens (Gutiérrez-Martín, Pinedo-González, R., & Gil-Puente, 2022). Therefore, MIL offers a wide range of possibilities for shaping new virtual public spaces (Riva, 2019), and in this way, everyone can "evaluate which information is – and is not – included in media messages, what voices are heard and which are silenced, and who is represented - and how - in the media" (Wilson, 2012: page 18). In this context, the MIL curriculum for teachers (Wilson, Grizzle, Tuazon, Akyempong & Cheung, 2011; Grizzle et al., 2021) makes it possible to make note of their levels of achievement; it also permits establishing a baseline for the training of critical citizens in terms of information and the media.

The greatest challenge for schools in light of the COVID-19 pandemic was accepting that online education means assuming competences related to ICT and means of communication. This challenge proposed a reflection on the digital gaps generated by the lack of connectivity, fake news and citizen misinformation. These practices were accentuated during the pandemic as infodemia, affecting the health and well-being of society (Su, Lee & Xiao, 2022). The above-mentioned factors make up relevant and debatable aspects in the field of education. Based on them, the need emerges to promote MIL, which is lacking in the basic education curriculum in Peru, in spite of the recommendations by experts and world organizations (Cuervo-Sánchez, Martínez-de-Morentin & Medrano-Samaniego, 2022). The current panorama is characterized by the use of information through digital means, given the increasing access, ease of use and immediacy; however, it is difficult to say that today's society is better prepared or has greater knowledge to tackle problems, due to the limited competences with regard to information processing and positioning in the media.

1.1. MIL: The Concept and Methodological Development

The United Nations Education, Science and Culture Organization (UNESCO) supports the inevitable unification of Information Literacy (ALFIN) with Media Literacy (ALMED), given the propensity for media and technology convergence (Jenkins, 2006; Solari, 2018, cited in De La Fuente, Lacasa & Martínez-Borda, 2019). In this sense, MIL reveals its holistic and integrative sense, the product of the evolution of the literacies (multiliteracies) and the juxtaposition or integration of focuses (Área & Guarro, 2012). From this comprehension, it is crucial to combine technological skills and abilities in order to locate, organize, evaluate and communication information; this is together with a critical and reflective character when it comes to processing information (Valle-Razo, Torres-Toukoumidis & Romero-Rodríguez, 2020). MIL enables essential competences: (knowledge, skills and attitudes) so that citizens can effectively intervene with the media and information. It thus contributes to an ongoing, competent, democratic, ethical, critical and participatory education (Gutiérrez-Martín et al., 2022; Valle-Razo et al., 2020).

By promoting MIL, UNESCO strives for humans to boost their skills, rights and responsibilities, to take assertive action with regard to the media and information (Aguaded, Jaramillo-Dent & Delgado, 2021). For these purposes, MIL has evolved over the first 20 years of the 21st century (Figure 1), and currently it is headed towards the reinforcement and integration of competences that complement one another, and which are necessary for multiliteracy in society, of both digital natives and immigrants (Frías-Guzmán, 2015; García, 2015; Valle-Razo et al., 2020). The learning of these skills involves concentrating not only on the technical and instrumental sense of technology, but also on its critical positioning; it also involves the environment, which is increasingly more mediatized (Pérez-Rodríguez, 2020), given the family's and the school's involvement in the materialization of MIL (Romero-Rodrigo, Gabarda-Méndez, Cívico-Ariza & Cuevas-Monzonís, 2021).

The integration of MIL focuses its interest on the training of citizens for an IKS, characterized by digital and intercultural aspects, as an "important tool to promote equitable and critical access to information and knowledge, and also for the promotion of independent, free and pluralistic means of communication" (Carias-Pérez, Hernando-Gómez & Marín-Gutiérrez, 2021). By integrating ALFIN, MIL emphasizes the

need to access information, its evaluation and ethical use; by integrating ALMED, it allows us to understand the functions, performance and commitment of the media. For educators, MIL means justice, i.e., the possibility to offer significant or optimal competences that are necessary to get on in life and at work; it also makes them aware of the rights to access and exchange information and the ethical use of technologies. At the same time, these constitute a thematic field, a way of teaching and learning with a critical meaning (Wilson, 2012).

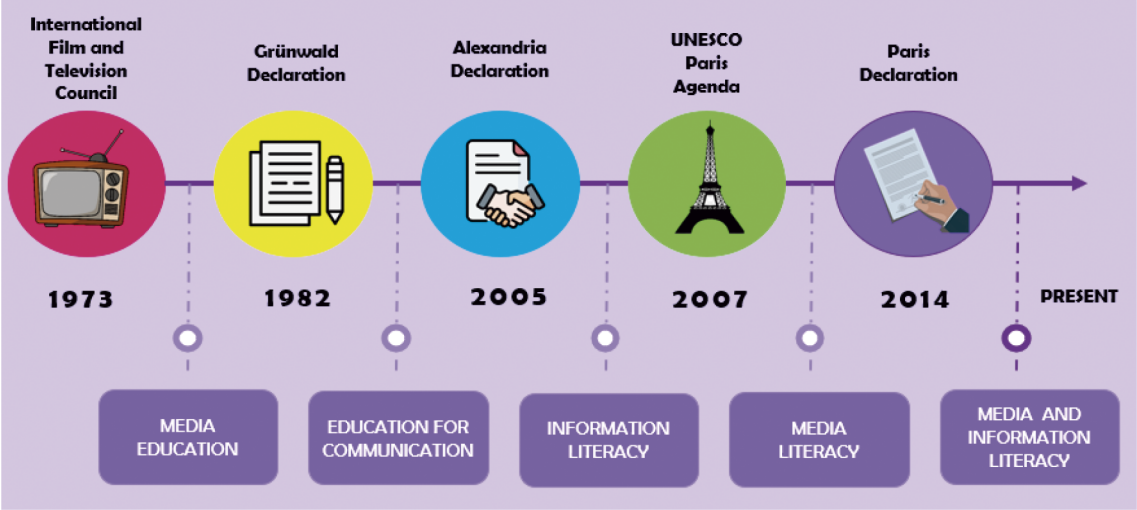

Figure 1. Development of MIL (Aguaded et al., 2021: page 26)

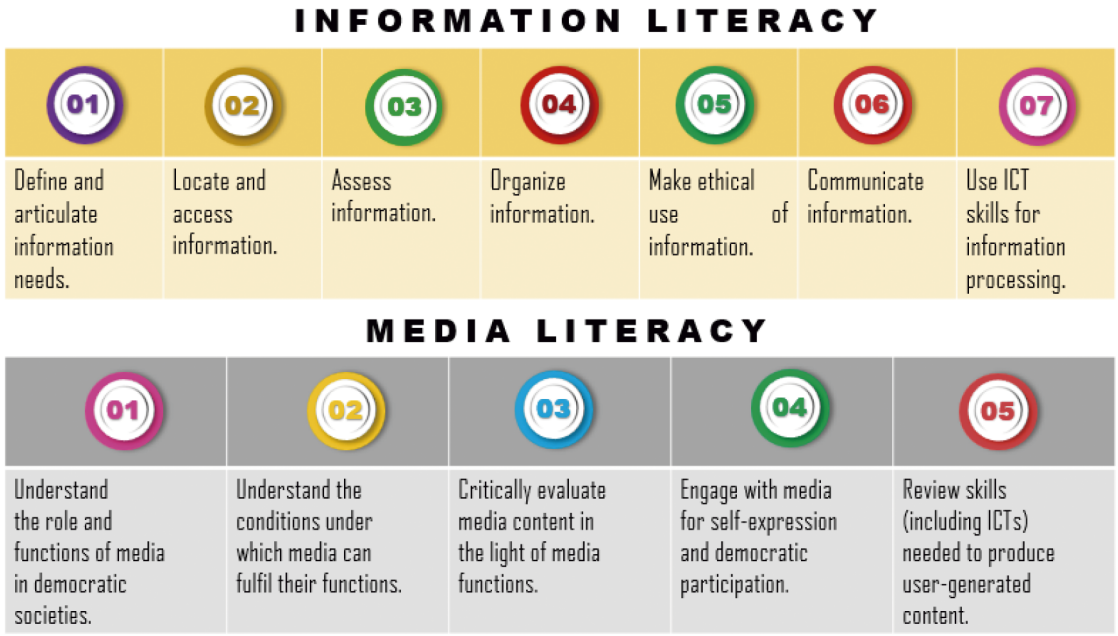

Figure 2. Elements of MIL. (Wilson, Grizzle, Tuazon, Akyempong & Cheung, 2011: page 18)

MIL promotes essential competences in citizens, such as the freedom of expression and access to information (Figure 2). The convergence of technologies blurs the limits between the literacies; seen in a holistic manner, this dilutes the fragmentation and takes a step toward a broad, common framework or focus. Individually, the types of literacy are incorporated and developed in personal, educational, professional and social environments (UNESCO, 2013a). Furthermore, MIL, as an inclusive mode of literacy, incorporates the current multimedia communications scenario (radio, television, cinema, newspapers, physical and online books, the Internet, digital archives, libraries, museums, etc.) and

transmedia phenomena, among them, digitalization, "the affordability and portability of systems and devices for media production; as well as the increasingly greater interoperability among the networks, thanks to the pan-expansion of the Internet, indicating the path to transliteracy" (Santiago del Pino, Goenechea & Romero, 2019: page 1046).

MIL emphasizes the important role of the media in promoting freedom of opinion, expression and life-long learning. Therefore, it is of interest for information suppliers to be integrated into libraries, museums, the Internet, archives, organizations, etc., along with the mass media (Aguaded et al., 2021). For MIL, the contribution by Ferrés (2007) is especially relevant, as his studies on media competence in different areas and contexts have left their mark, becoming a milestone in light of their transcendence. Ferrés (2007) establishes a baseline, while at the same time defining dimensions and indicators, which have been adopted as references in media education. Later, Ferrés and Piscitelli (2012) review media competence and establish six dimensions: languages, technology, processes of interaction, processes of production and dissemination, ideology, values and aesthetics (Mateus, Andrada & Ferrés, 2019) as essential processes for the development of MIL.

1.2. Training of Teachers and Students in MIL

The MIL Curriculum and Framework of Competences for Teachers is based on human rights and inclusive education. Wilson et al. (2011) considers teacher training in these competences to be vital, in order to empower citizens through training in "learning how to learn". For Aguaded, Marín-Gutiérrez and Díaz-Pareja (2015), MIL guides profound transformations in teaching practices, given its nature of continuity and association with social endeavors; the same applies to the implementation of curricula. The shift toward instructional transitions incites renewed competences that make it possible to tackle the current challenges, from research and quality curricula (Santiago del Pino et al., 2019); educational policies, communication and technology, culture and public management (UNESCO, 2013b).

In Latin America, Catrilef-Lerchund and Carias-Pérez (2020) investigated MIL in Chile. They state the need for its implementation, evaluating the contribution to the study curricula and the limited consideration of its foundations and practices in teacher training. Their study reflects the deep lack of knowledge about MIL, which in some cases, leads to it being confused with digital literacy. This demonstrates the need for its curricular integration, along with reconsidering the orientation of new virtual scenarios (Santiago del Pino et al., 2019). On the other hand, Sánchez and Castellanos (2021) considered MIL from the perspective of ICT in Venezuelan education, finding that MIL constitutes a fundamental area that reveals social, political and cultural needs that emerge by understanding ICTs as mediators of knowledge. For teachers, both MIL and ICT constitute useful knowledge, by enabling student interaction with the courses and their environment.

The supposition that students, by growing up with technological means at their disposition, are digital natives may actually be counterproductive and constitute an excuse to ignore the responsibility on the part of the educational system. Social commitment to the mandatory promotion of media education for adolescents and young people is essential, covering everything from ICT to MIL, as an educational resource and its curricular integration (Gutiérrez-Martín et al., 2022). However, being surrounded by information and the media does not guarantee a complex and critical comprehension of the media context, and it is the duty of the schools to provide the reflection on the intercultural values that are transmitted (Carias-Pérez et al., 2021). The key to MIL lies in teachers and students examining the issues related to the media and information, producing media contents, promoting discussions and debating their contributions.

For the purpose of contributing to improving Media and Information Competence (MIC), given the gap in the study curriculum, Cuervo-Sánchez et al. (2022) implement intervention programs for adolescents in Spain and Colombia, which educate them in the use of the media, promoting digital citizens who transform their communicative reality. The results evidence certain favorable differences, according to which Spanish students achieve an immediate impact in Language and Critical Comprehension, whereas

Colombian students improve in terms of Production Processes. On the other hand, Aguilar (2019) emphasizes the value of MIL by preventing bad habits in Catalonian secondary students and reports the good use of ICTs through the responsible consumption of news information on social networks. All of this is intended to counteract "cyberbullying, dependencies and disorders and, on the other hand, misinformation and the lack of critical judgment, given the influence of fake news and misinformation" (Aguilar, 2019: page 103).

With regard to the evaluation of MIL, Cuervo, Foronda, Rodríguez and Medrano (2019), based on an instrument constructed from the dimensions of educommunication, define certain crucial aspects: (i) access to and use of the media, (ii) media language and critical comprehension, (iii) production processes and programming and (iv) transformation of the situation itself with the communication. With each successive application, they demonstrate the reliability and validity of the instrument, with adolescents in Colombia, Ecuador and Spain. The results indicate the effectiveness of the instrument for evaluating MIL. Lopes, Costa, Araujo & Ávila (2018), in a study aimed at verifying the validity of a test on MIL practices and skills, corroborates the presence of good parameters of discrimination and difficulty, given the relevance of the conceptual framework. They also evidence that during the development of MIL, no statistically significant differences are observed between males and females, and there is a positive association between the educational level and achievement of MIL; in other words, lower levels of education correspond to lower levels of literacy.

1.3. The Development of MIL in Peru

For Mateus and Suárez-Guerrero (2017), the presence of the ICT competence, along with other capacities and standards disseminated in the Basic Education curriculum, constitutes the starting point for media education. These interactions make it possible to interact with the media in a critical way, which is uncommon in the Peruvian context. On the other hand, they evidence that "the Peruvian curriculum and ICT competence represent a valuable opportunity to revitalize their development. Even though media competence is not spelled out as such, many of its conceptual proposals are" (Mateus and Suárez-Guerrero: pages 143-144). They stress that, in this country, digitalization policies have been implemented without attention to developing aspects that would allow MIL to promote the formation of reflexive citizens.

In higher education, specifically, in teacher training, Turpo-Gebera (2020) shows that MIL shapes an emerging line of research. In this study, according to the analysis of university theses, MIL is conceived as a non-integrated construct, where the main focus is on ALFIN; essentially, on continuous teacher training. It also shows that there is little research focus on ALMED. With regard to MIL, national researchers prioritize components of a functional nature, i.e., operationalization, and dedicate less attention to aspects related to critical use, content generation, and ethics for harmonious and democratic coexistence.

In the research by Gonzales-Miñán, Turpo-Gebera and Suárez-Guerrero (2020), by recognizing levels of self-perception of media competence and its relation to the sociodemographic variables of the teaching staff in Lima, they show primarily low to medium levels of results for media competence. In a study aimed at recognizing the self-perception of ALFIN in art school students, Espinoza-Salazar and Tamariz-Nunjar (2021) found that the results show an intermediate level, with male students reporting more difficulties in accessing, using and evaluating information, as opposed to female students who obtain better results.

Research on MIL in Peru is characterized by the lack of studies and their consideration as independent or separate literacies that are thus not integrated. While their transcendence and the need for their integration has been stressed, the lack of training in ICT from a sociocultural perspective considers them from an instrumental, but not integrating perspective (Mateus & Quiroz-Velasco, 2021). MIL emerges and is gradually being established as a line of research, essentially for the intensification of digital literacy, the curricular integration of the ICTs, the penetration of the Internet, public e-governance policies and the virtualization of public services (Turpo-Gebera, Hurtado-Mazeyra, Díaz-Zavala & Zarate-Yepez, 2021). In

Peru, the integration of MIL in educational processes is crucial for the appropriate use and critical and ethical positioning with regard to information, and for media proficiency and the increasing misinformation present in today's society.

Given the trajectory of MIL, in both the national and international context and its gravitating importance in personal and social development, its measurement and evaluation are worthy of attention. For this purpose, the study objective considers the design and validation of a questionnaire, based on the UNESCO proposal (Figure 2), in order to measure the self-perceived performance by secondary students in the 7th cycle (9th, 10th and 11th grades), in order to determine the associativity of the factors (family-related, educational and social) with the levels of MIL achievement. In this way, the correlations of the MIL dimensions are evidenced with the determining factors. In essence, the diagnostic evaluation contributes to the knowledge of the levels of appropriation and performance of MIL in the school setting, thus making it possible to develop proposals that incorporate it as a cross-curricular axis in the educational process and/or integrated contents in some curricular areas, as well as in the design and implementation of programs of educational intervention.

2. Methodology

The development and validation of the AMI-Peru-21 questionnaire is framed within a quantitative, non-experimental and descriptive design, with a cross-curricular scope. It begins with the construction of the instrument, followed by its validation by experts and finally, its confirmation by means of an empirical study. The measurement of MIL is performed by means of self-reporting and perceived self-efficacy by the students who respond to the questionnaires. The research contribution seeks to provide the educational and scientific community with a tool for the analysis of self-perceived MIL in Peruvian secondary school students and, based on this, the creation of educational proposals.

2.1. Instrument Design

To develop the questionnaire, a comprehensive review of the bibliography was carried out on the state of MIL knowledge over the last decade, as well as the instruments most commonly used to measure ALFIN and ALMED. The questionnaire is structured around the MIL Curriculum dimensions and indicators for teachers 2011, proposed by UNESCO (Figure 2) and curricular aspects proposed by UNESCO (Grizzle, Wilson, Tuazon, Cheung, Lau, Fischer et al., 2021). Based on the theoretical considerations of the (Wilson et al., 2011; Grizzle et al., 2021), the items were organized that were used to evaluate and measure AMI (79 items). The resulting instrument considers the following variables:

Socioformative (16 items): i) Personal (age, gender); ii) Social/family (items related to cohabitation in the home, persons with whom the home is shared, type of dwelling, basic services, number of computers in the home, ownership of a mobile telephone, Internet access) and iii) Educational (educational institution, management type, level of studies, extracurricular activities) factors.

For the ALFIN variable, the 7 elements proposed by UNESCO were used to formulate 44 items, distributed into these dimensions; meanwhile, for the ALMED variable, 35 items were proposed, grouped into 5 dimensions, based on the 5 elements (Figure 2).

2.2. Expert Opinion

With the items assigned according to each indicator and dimension, the instrument was shared for evaluation by the judges (Figure 3). For this purpose, 10 experts in MIL were consulted, all Spanish-speaking, having earned doctorates and knowledgeable about the context of application. They were sent the instrument by email, along with the consistency matrix and the rating template. The validation considers 4 categories: sufficiency, clarity, coherence and relevance; and each item is estimated on a scale of 1 to 4, where 4 is the highest value. Their contributions and suggestions were collected in the observations section. The group of experts consisted of:

National experts (Peru)	International experts
Doctor in Sociology Expert on Educommunication and the media	Doctor in Communication Expert on ALMED and gamification (Ecuador)
Doctor in Communication Expert on media competence	Doctor in Regional Studies Expert on educational research (Mexico)
Doctor in Education Expert on bibliometry, ALFIN and statistics	Doctor in Education and Communication Expert on Education and ALMED (Brazil)
Doctor in Computer Sciences Expert on educational technology	Pre-doctoral researcher Expert on Educommunication and ALMED (Spain)
	Doctor in Computer Engineering Expert on Software Engineering and e-Learning (Spain)
	Doctor in Biological Sciences Expert on Library Science and Information Sciences (Spain)

Figure 3. Origin and training of the experts consulted for the study

Following the evaluation by the experts, the evaluations were analyzed and the validity coefficient was determined according to Aiken's V (0.88). This significant value makes it possible to quantify the relevance of the items with regard to a content domain, from the estimations of the judges. With regard to the structuring of the instrument, most of the specialists consider the number of items to be pertinent; in some cases, they suggest reducing certain items in order to facilitate the responses. Based on the observations and recommendations of the experts, the score obtained for each item was reviewed and analyzed, eliminating those with a score of less than 0.70. The application of the instrument (version v1) included 56 items, 34 corresponding to ALFIN (10 items were eliminated) and 22 to ALMED (13 items); in addition, 13 socioformative data items were collected (4 items were eliminated and 1 was added).

2.3. Population and Sample

The province of Arequipa is located south of Lima (Peru), and it is considered to be the country's second city in terms of its development. According to the school registration records for 2021, a total of 55,794 students were registered for the 7th cycle (9th, 10th and 11th grades) of Regular Basic Education (EBR, according to its Spanish acronym), in one of the three Local Educational Management Units (UGEL) reporting to the Regional Educational Management in Arequipa (GREA). The study sample consisted of 1250 students, collected by means of non-probabilistic sampling of an incidental nature, based on the accessibility of the subjects (Marín-Díaz, Sampedro & Vega 2017).

Of the 1250 students in the sample (Table 1), a slight predominance of females is evident; however, considering the proportion of students, their distribution is representative of the student population.

		Population		Sample	
		F	%	S	%
Local Educational Management Unit (UGEL)	Southern Arequipa UGEL	21,222	38	371	30
	Northern Arequipa UGEL	28,689	51	789	63
	La Joya UGEL	5,883	11	90	7
	Total	55,794	100	1250	100
Gender	Female	27,273	49	706	56
	Male	28,521	51	544	44
	Total	55,794	100	1250	100

Table 1. Population and sample of students by Local Educational Management Unit (UGEL) and gender. Educational census 2021 ESCALE (Ministerio de Educación, 2021)

3. Results

The information analyzed was organized taking into consideration the proposed objectives for the study. The first analysis corresponds to the reliability and validity of the questionnaire. Next, the correlations between ALFIN and ALMEN were obtained in order to determine the direction of the MIL. Finally, the associativity among the socioformative factors with the dimensions of MIL was analyzed. The intention of these analyses is to ensure the validity and reliability of the AMI-Peru-21 questionnaire.

3.1. Analysis of the Reliability of the MIL Instrument

This section presents the statistical treatment of the reliability, in order to evaluate the internal consistency of the instrument through the Cronbach's alpha coefficient. The scores obtained showed high levels of reliability, for both the general scale (0.960) and for each of the ALFIN dimensions (0.934) and ALMED (0.926).

3.2. Exploratory Factor Analysis of the MIL Instrument

Bartlett's test is a test of the security and that the necessary conditions have been met to test the null hypothesis (H_o): the determinant of the populational correlation matrix (r) is equal to 1; while the KMO statistic is used as a prior stage to the Exploratory Factor Analysis (EFA), indicating whether the EFA is or is not the appropriate method for processing the data (Pere & Anguiano-Carrasco, 2010). In this case, Bartlett's test of sphericity proved to be significant (2645.5, gl= 55, p-value < 0.0001), as well as the Kaiser-Meyer-Olkin measure of sampling adequacy (0.97). Furthermore, values greater than 0.90 were obtained for all items, and thus the Ho was rejected and the use of the EFA was considered adequate for finding the factors or dimensions of MIL.

In the final product, the higher eigenvalues reveal seven factors; however, as seen in Figure 4, three is the ideal number of factors to be considered (Table 2). This explains the overall variance of 0.74.

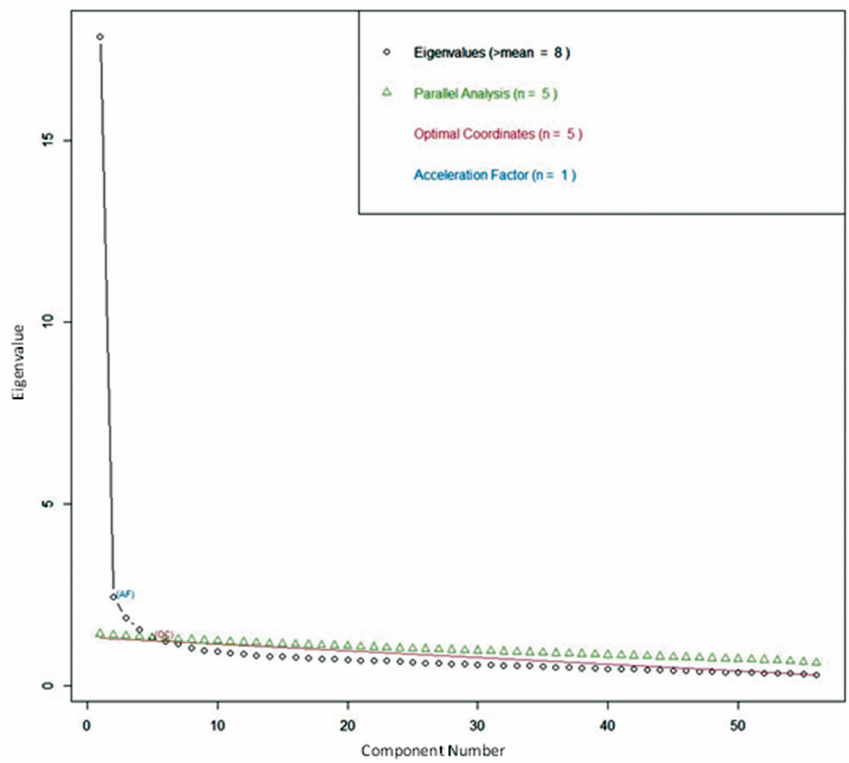

Figure 4. Eigenvalue solution to determine the number of factors or components

Items	Factor 1 ALFIN	Factor 2 ALMED	Factor 3 MIL	Items	Factor 1 ALFIN	Factor 2 ALMED	Factor 3 MIL
1	0.586		-0.211	29	0.415	0.186	
2	0.492	0.152	-0.128	30	0.384	0.210	
3	0.532			31	0.375	0.122	
4	0.403			32	0.301		0.287
5	0.517		0.157	33	0.118	0.106	0.493
6	0.422	0.120		34	0.186		0.428
7	0.572		0.107	35	0.400	0.415	-0.155
8	0.529	-0.150	0.278	36	0.272	0.386	
9	0.575	-0.140	0.240	37		0.523	
10	0.570	-0.102	0.219	38		0.474	0.155
11	0.563		0.179	39		0.457	0.199
12	0.694			40		0.545	
13	0.639	-0.164	0.112	41		0.610	
14	0.463	-0.134	0.270	42	-0.172	0.699	
15	0.506			43	0.347	0.443	-0.195
16	0.473		0.107	44	0.391	0.375	-0.122
17	0.292		0.388	45	0.165	0.461	0.103
18	0.437		0.230	46	0.162	0.287	0.276
19	0.460		0.239	47		0.432	0.245
20	0.268		0.440	48	0.186	0.496	
21	0.353		0.302	49	0.134	0.264	0.346
22	0.510	0.185	-0.132	50	-0.201	0.301	0.551
23	0.433		0.157	51	-0.120	0.616	0.171
24			0.438	52	-0.140	0.567	0.266
25	0.293		0.414	53	0.108	0.446	
26		0.145	0.464	54		0.413	0.179
27		0.221	0.395	55	-0.133	0.349	0.467
28	-0.120	0.148	0.540	56	0.168	0.397	0.146

Table 2. Exploratory factor analysis of the AMI-Peru-21-v1 instrument

Considering Table 2, the next step was the principal component analysis by means of oblique rotation, with the correlations per item analyzed falling between 0.3 and 0.72; item 46 was eliminated, due to the fact that its correlation does not exceed the minimum expected figure (0.30). It was therefore not included in the grouping of the three determining factors, which were grouped with a minimum of twelve items. The first two factors were regrouped according to the peculiarities of ALFIN and ALMED, while the third factor, AMI, would represent the integration and juxtaposition indicated by UNESCO (Wilson et al., 2011). The internal consistency test by means of McDonald's Omega reliability test made it possible to evidence a validity of 0.97; by not eliminating any item as a result of the exploratory factor analysis, the total Omega per subscale is f1=0.98, f2=0.94 and f3=0.68.

3.3. Exploratory Factor Analysis of the MIL Instrument

The confirmatory Factor Analysis (CFA) was carried out with the objective of verifying the new structure obtained for the EFA.

The results obtained for the X^2 value indicate that it is less than 0.05, which implies that the model is significant and has acceptable values: CFI=0.840; TLI=0.833; RMSEA=0.049 (<0.05) and SRMR=0.045. In this manner, it is evidenced that all of the items in each factor have significant values that are less than

alpha (0.05), indicating that each item explains the factor to which it belongs (Figure 5). For the purposes of applying the instrument, it was opted to consider the three-factor model revealed in the exploratory factor analysis and to eliminate item 46, thus producing the final version of the instrument, which consisted of 55 items, as observed below (AMI-Peru-21-v2).

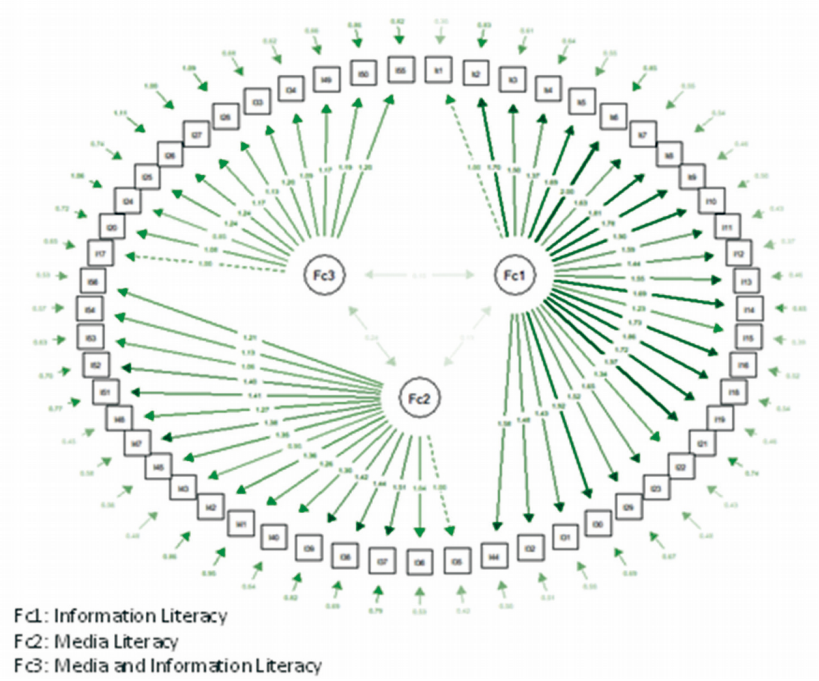

Figure 5. Confirmatory model of the new version AMI-Peru-21. v2

Informational Literacy (ALFIN)	
No.	**Item**
1	I am capable of searching for information on the Internet.
2	I am capable of finding information by following hyperlinks.
3	I adjust searches according to the results found.
4	When a topic interests me, I know where to find information.
5	I identify reliable information according to the pertinence of the sources.
6	I consider the costs and benefits of the choice of information.
7	I define the key words for searches until achieving a satisfactory result.
8	I use an appropriate search strategy for each query.
9	I locate the most appropriate sources of information in response to my query.
10	I determine whether the information retrieved constitutes reliable evidence.
11	I evaluate the quality of the information content.
12	I determine which data from the information are useful.
13	I access a variety of sources of information in relation to a topic.
14	I compare the retrieved information, using different sources.
15	I use the results obtained from information searches.
16	I distinguish among the uses of different information resources on the web.
17	I synthesize the information according to its relevance and importance.
18	I record the retrieved information according to its importance.
19	I am aware of the criteria of responsibility in information management.
20	I understand the responsibility for the misuse of information.
21	I make the decisions that are the most appropriate with regard to the use of information.

22	I obtain information quickly and easily.
23	I use technologies for searching for, compiling and disseminating information.
24	I make use of the information obtained to solve problems or make decisions.
25	I use information to provide feedback on what I have learned.
26	I understand the influence of the media on the interpretation of information.
Media Literacy (ALMED)	
27	I identify the functions of the mass media in society.
28	I value the plurality of the media as platforms for social dialog.
29	I identify when a media source violates ethics in terms of information.
30	I understand the value of verification as a mission of public service.
31	I establish connections between the media content and the social context.
32	I critically interpret the content disseminated by the media.
33	I critique the representations and/or fake news about people and events.
34	I discuss the lack of representation of all social sectors in the media.
35	I recognize the importance of the social communication media.
36	I examine the information from the media, considering its reliability and biases.
37	I recognize the contexts of creation for newsworthy information.
38	I understand the impact of the context when it comes to interpreting information from the media.
39	I adopt a critical stance towards fake news and misinformation.
40	I analyze the information contents, determining any prejudices.
41	I use communications tools and networks to stay up to date.
42	I base my opinion on the use of different informational sources.
43	I make decisions based on reliable, validated contents.
Media and Informational Literacy (MIL)	
44	I compare information according to its hierarchy and comprehension.
45	I classify information to save and retrieve it when I need it.
46	I respect the copyrights in the use of information.
47	I know where to share information, according to its purpose and topic.
48	I share information and digital contents over the web.
49	I use digital tools for cooperation and the co-creation of contents.
50	I usually comment on the information shared by other users.
51	I organize databases for handling the retrieved information.
52	I relate the management of retrieved information to my learning achievement.
53	I apply strategies to draw conclusions, make generalizations, synthesis, etc.
54	I create informational contents to support a point of view.
55	I express my ideas through different informational formats.

Table 3. AMI-Peru-21-v2 Questionnaire

The final version of the AMI-Peru-21-v2 questionnaire contains 26 items for ALFIN, 17 items for ALMED and 12 items for AMI. Compared to the initial version (v1), the number of items was reduced from 79 items (before the expert opinion stage) to 55 items in the final version (v2). For this final decision, the results and regrouping were considered that were obtained in the EFA and CFA, which suggest a common framework and the integration of items into a third factor.

3.4. Association Between ALFIN and ALMED

The result of the Shapiro-Wilk normalcy test applied to the ALFIN and ALMED variables indicates that they do not present a normal distribution ($p<0.05$). As a result, the Spearman's Rho correlation test was used between the two variables, confirming that there is a significant positive linear behavior ($p<0.05$, $rs=0.812$); i.e., the greater the level of ALFIN is, the greater the level of ALMED will be or vice versa (Figure 6).

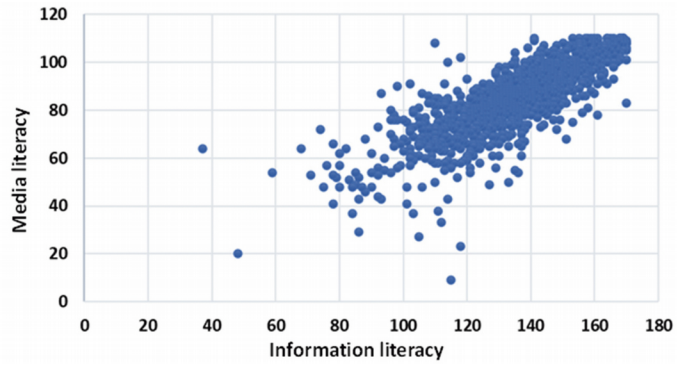

Figure 6. Dispersion diagram for the variables ALFIN and ALMED

3.5. Association of Socioformative Factors with MIL Levels

In the development of MIL, different factors intervene that evidence levels of achievement that are isolated or independent of the students' social and cultural context. However, the permanent coexistence with information devices and means of communication allow for the application of the acquired knowledge and skills, in such a way that when the pertinent resources are not found, the learning may be limited. It was from this perspective that the inferential analysis was conducted, in order to verify whether the socioformative variables are associated with levels of MIL. Likewise, it was decided to apply non-parametric tests, since according to the normalcy tests applied to all the variables, they did not approximate a normal distribution ($p < .000$).

Table 4 shows the non-parametric tests for the MIL levels, according to the socioformative factors with significant differences ($p < .000$), not considering those factors for which no relevant differences were observed. First of all, the MIL levels were compared according to whether the students had electricity, a service that conditions the possibility of having Internet and a computer at home. The test proved significant with the highest levels of MIL for those who had said utility (631.24), indicating the importance of having basic services for use in daily life (UNESCO, 2013b). The gender variable is also associated with levels of MIL ($p < .000$), given that females obtain higher levels of achievement for the variable being evaluated (666.24), as they do so from a practical and utilitarian perspective, while males associate it with leisure and entertainment.

Normalcy p value	Variable	Group:	n	Mean range	Type of test	Statistic (p value)
0.166	Electricity supply	Yes	1227	631.24	Mann-Whitney U	7072.5 (.000)
0.000		No	23	319.5		
0.000	Gender	Male	544	572.63	Mann-Whitney U	163269.5 (.000)
0.000		Female	706	666.24		
0.000	Type of management of the educational institution	Public	291	602.99	Kruskal-Wallis	21.62 (.000)
		Subsidized	330	704.55		
		Private	629	594.44		
0.000	Year of studies	9th	421	585.87	Kruskal-Wallis	16.00 (.000)
		10th	431	610.83		
		11th	398	683.31		
0.000	UGEL (Local Educational Management Unit)	Southern Arequipa	371	610.63	Kruskal-Wallis	14.93 (.001)
		Northern Arequipa	789	647.18		
		La Joya	90	496.73		

Table 4. Comparison of the levels of MIL according to socioformative factors

The results for the type of school management where they study and levels of MIL obtained reveal significant differences. Accordingly, students who come from subsidized institutions (privately managed, state-financed public schools) have higher scores (704.55) than those who attend directly managed public institutions (state-financed public schools) (602.99) and privately managed schools (with no state financing) (594.44). According to Ministerio de Educación (2018), among the private institutions are distinct differences in educational quality, due to the variability in costs and the considerable number of low-cost private institutions, as compared to high- or very high-cost private institutions. With regard to the cycle of study variable, students in 11th grade have higher levels of MIL (683.31) than those in lower grades. The results confirm the progressive sense of MIL acquisition, where families and schools exercise a coordinated and coherent responsibility for their achievement (Romero-Rodrigo et al., 2021).

Finally, the MIL results were compared according to the UGEL (administrative authority) to which the educational institution belongs. Like the previous tests, significant variations are observed in the levels of MIL achievement, i.e., students who come from UGELs located in urban city areas have higher levels of achievement than those from the non-urban areas. The variations would be due to the fact that, on the one hand, most of the subsidized educational institutions belong to territorial jurisdictions with greater resources, which are associated with better results; on the other hand, the educational institutions belonging to the La Joya UGEL, since they are located in a non-urban area, have limited basic services, which complicates access to information and thus the use and appropriation of MIL by most students.

4. Discussion

The aim of the study was accomplished with the design, construction and validation of the final version of the MIL self-perception questionnaire (AMI-Peru-21v.2). The instrument considers three dimensions (ALFIN, ALMED and MIL) as the result of the successive confirmations, determined to be significant according to the self-perception of the students making up the sample. Their definition made it possible, in turn, to measure the different levels of MIL achievement, as well as its association with the socioformative factors of the students in the last cycle of intermediate education in the public and private institutions of the province of Arequipa-Peru. The results of the study show evidence for the need for interventions that reverse the deficits in MIL achievement.

Among the relevant results, age is seen as a determining factor of MIL development, given that as the students grow older and move onto more advanced cycles of studies, the level of achievement increases (Aguaded et al., 2015, Lopes et al., 2018). These increases are related to the greater personal experience with ICT, as a constant process that occurs throughout life (Potter, 2004 in Valle-Razo et al., 2020), a result that is evident in educational institutions in the inner city urban area and those in the suburbs. The "maturity of development" considers age and education as determining factors of cognitive, emotional and moral level, and thus the autonomy and critical approach to the media and informational contents (Valle-Razo et al. 2020; Aguilar, 2019).

With regard to the gender of the subjects of the study, the greatest level of MIL mastery was observed in females, coinciding with the research done by Valle-Razo et al. (2020); males show lower scores for ALFIN, which is the result of the difficulties they have to access, use and evaluate information (Espinoza-Salazar et al., 2021). The results of this study dispute the findings of Lopes et al. (2018) and Aguaded et al. (2015), who found no statistically significant differences between males and females. The disparities in the results could be due to the preferential use of the social networks; while females orient this use towards maintaining social relations, males prioritize its use for online games (Fernández-Montalvo, Peñalva & Irazabal, 2015). These uses of ICT gravitate toward the orientation and development of MIL (Gómez-Pablos, Muñoz-Repiso, Martín & González, 2020).

The studies evidence that digital competence, subsidiary to MIL, is related to and increases when a computer and other technological devices are found in the home (Gómez-Pablos et al., 2020). In this study, the real situation in which the students who were evaluated live shows that the majority lack basic services (electricity, Internet) at home, primarily in rural (non-urban) areas. These deficits are concentrated

in those with lower levels of MIL achievement, especially in secondary students, due to the limitations on Internet access and use. Furthermore, those that do have it do not make "conscious use of the processes related to selecting and analyzing information, which allows for the development of thought and creativity" (Santiago del Pino et al., 2019: page 1047).

The lack of devices or Internet connectivity, as well as the connection speed, constitute limiting factors that influence the level of achievement of digital competence by the students (Mateus, Andrada, González-Cabrera, Ugalde & Novomisky, 2022). The COVID-19 pandemic transformed the homes of students into places of study, revealing the shortcomings in terms of resources to face this challenge. Under these circumstances, not all students achieved the expected level of studies due to the limited mastery of digital competences (Orosco, Gómez, Pomasunco, Salgado & Álvarez, 2021). In the research conducted here, it was observed that the meager socioeconomic income, limited access to electricity and the inadequate technological infrastructure of the educational institutions affected the levels of MIL achievement; it was the La Joya UGEL (in a rural non-urban area) where the least development was seen.

The diagnosis regarding MIL development in secondary students in the province of Arequipa has allowed us to distinguish dissimilar levels of achievement, revealing educational and social inequalities. Based on the results evidenced here, it would seem appropriate to propose initiatives that lead to obtaining greater levels of MIL achievement. From the perspective of curriculum, there is an urgent need to integrate MIL into educational processes, as a cross-curricular competence associated with the "performance in the virtual environments generated by ICT" (Ministerio de Educación, 2016). Another possibility for curricular integration may be the incorporation of contents into the curricular areas, in other words, the knowledge and skills promoted by MIL would be addressed in courses such as the Social Sciences, Communication and other pertinent subject areas. There is also the possibility of implementing extracurricular activities as a strategy to strengthen the appropriation and projection of MIL in daily life.

The strategies suggested for the development of MIL in Peruvian students stems from the strategy of taking advantage of adverse situations as educational opportunities. Grizzle et al. (2021) encourages teachers and students to use information and the current and traditional media for self-realization. Greater participation in democracy and creativity are essential for the consolidation of an ethical and critical citizenry. Along these lines, in order to fight against "infoxication", misinformation and post-truth, García-Roca (2021) suggests the creation of new digital textualities of a collective nature, such as Creepypasta (digital horror stories), works that contain a constructive hyperfiction, framed within false news and urban legends. The proposal seeks to equip students with techniques and narrative resources so that when properly used, they can shape a privileged space for MIL.

The incorporation of MIL in formal educational processes requires the design and implementation of curricular programs, workshops or modules that tackle infoxication, misinformation and fake news; networking with other institutions is also necessary, in order to generate interventions linked to local and international forums, demonstrating "an evolution in the initial knowledge toward an assessment that is closer to a learning community in which its members interact with one another" (Araya, Gil & Fonseca, 2021: page 54), towards training and performance in media and informational competences. With this intent in mind, the mastery of ICT, the acquisition of strategies such as mobile learning, flipped classroom, MOOC and design thinking contribute to achieving the corresponding performance in terms of MIL (Aguaded et al., 2021).

Finally, the hyperconnected reality in which we are immersed gives educational agents a relevant role in formative socialization. The school and the family have substantial responsibilities in promoting and developing critical thinking, by considering MIL a powerful resource to attain new competences and skills, with the timely, consistent participation of parents. In this way, they assert capacities to adapt quickly and flexibly and to act responsibly in the use, consumption and enjoyment of the media and information, deliberately and responsibly maturing in terms of themselves and others (Romero-Rodrigo et al., 2021).

5. Conclusions

The results of the study show the direct association between certain socioformative factors such as age, gender, type of school, place of residence, use of essential services and access to technological resources and the development of MIL. Its incidence is significant and corresponds to the responsibilities of the State and families. By extension, it is in the interests of governments to ensure quality education, accepting the commitments that promote the conditions that are necessary to develop MIL, and therefore, the education of responsible, participatory citizens.

As the product of the evolution and convergence of two crucial literacies, ALFIN and ALMED, MIL makes it possible to tackle the challenges of the 21st century of our times, among them, the COVID-19 pandemic. Faced with these challenges, the urgency of their implementation emerges, as a means to assertively deal with both information and the media. The development of MIL involves the participation of education in both formal and informal learning. To achieve this, educational policies are required that defend the right of all citizens to access and produce contents with an ethical and critical sense. Along these lines, it is necessary to position MIL as a line of research at universities and, in turn, to provide evidence of its contributions to the educational context.

The development of MIL occurs beyond its instrumental or functional use, distancing itself from the mere use of ICT. Therefore, the aim must be a deep comprehension of its importance for social and inclusive coexistence. From this perspective, there are pedagogical and philosophical focuses on the promotion of an integrated work incorporating ALFIN and ALMED, in the interests of empowering citizens. In this way, the best preparation in MIL makes it possible to deal with misinformation, fake news and other harmful actions against the good use of information and the media. This highlights the importance of introducing MIL in the school curriculum, thus generating spaces for social exchange for civic training.

Education is fundamental for the evolution of MIL, and therefore it corresponds to the Ministry of Education to ensure its inclusion in the national curriculum, starting in the early years of school life. It is necessary to go beyond the handling of ICT, based on strategies that develop critical and ethical thinking, analytical-synthetic capacities, respect for differences, etc. In these endeavors, the role of the instructor is fundamental for developing MIL in students, and thus their preparation and training are crucial. There is an urgent need to make progress in the training and updating of teachers, in order to leverage MIL in favor of a responsible citizenry.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

References

Aguaded, I., Jaramillo-Dent, D., & Delgado, A. (2021). *Currículum Alfamed de formación de profesores en educación mediática: MIL (Media and Information Literacy) en la era pos-COVID-19*. Octaedro. Available at: https://octaedro.com/wp-content/uploads/2021/02/16265.pdf

Aguaded, I., Marín-Gutiérrez, I., & Díaz-Pareja, E. (2015). La alfabetización mediática entre estudiantes de primaria y secundaria en Andalucía (España). *RIED: Revista Iberoamericana de Educación a Distancia,* 18(2), 275-298. Available at: http://revistas.uned.es/index.php/ried/article/view/13407/13061 https://doi.org/10.5944/ried.18.2.13407

Aguilar, I. (2019). La Alfebetizacion Mediatica e Informacional como conocimiento transversal en la Educacion Secundaria Obligatoria. Tesis de Maestría. Universitat Autònoma de Barcelona, España. Available at: https://ddd.uab.cat/record/214905

Araya, C., Gil, M., & Fonseca, J. (2021). *Evaluación de competencias de Alfabetización Mediática e Informacional promovidas desde bibliotecas educativas por medio de radio estudiantil*. Informe Final. Universidad de Costa Rica. Available at: http://163.178.164.154/handle/123456789/544

Area, M., & Guarro, A. (2012). La alfabetización informacional y digital: fundamentos pedagógicos para la enseñanza y el aprendizaje competente. *Revista Española de Documentación Científica,* 35(Monográfico), 46-74. https://doi.org/10.3989/redc.2012.mono.977

Carias-Pérez, F., Hernando-Gómez, Á., & Marín-Gutiérrez, I. (2021). La radio educativa como herramienta de alfabetización mediática en contextos de interculturalidad. *Revista de Comunicación,* 20(2), 93-112. https://doi.org/10.26441/rc20.2-2021-a5

Catrilef-Lerchund, V., & Carias-Pérez, F. (2020). Alfabetización mediática e informacional en la formación inicial docente en la Ulagos. In Aguaded, I., & Vizcaíno-Verdú, A. (Eds.). *Redes sociales y ciudadanía. Hacia un mundo ciberconectado y empoderado* (549-554). Grupo Comunicar Ediciones. Available at: https://redalfamed1.wixsite.com/redesyciudadania

Cuervo, S., Foronda, A., Rodríguez, A., & Medrano, C. (2019). Media and information literacy: A measurement instrument for adolescents. *Educational Review,* 73(4), 487-502. https://doi.org/10.1080/00131911.2019.1646708

Cuervo-Sánchez, S., Martínez-de-Morentin, J., & Medrano-Samaniego, C. (2022). Una intervención para mejorar la competencia mediática e informacional. *Educación XX*1, 25(1), 407-431. https://doi.org/10.5944/eduxx1.30364

De La Fuente, J., Lacasa, P., & Martínez-Borda, R. (2019). Adolescents, social networks and transmedia universes: media literacy in participatory contexts. *Revista Latina De Comunicación Social*, 74, 172-196. https://doi.org/10.4185/RLCS-2019-1326

Espinoza-Salazar, L., & Tamariz-Nunjar, H. (2021). Autopercepción de la alfabetización informacional en estudiantes de una escuela de arte. *Horizontes. Revista de Investigación en Ciencias de la Educación,* 5(21), 1470-1479. https://doi.org/10.33996/revistahorizontes.v5i21.289

Fernández-Montalvo, J., Peñalva, A., & Irazabal, I. (2015). Hábitos de uso y conductas de riesgo en Internet en la preadolescencia. *Comunicar*, 44, 113-120. https://doi.org/10.3916/C44-2015-12

Ferrés, J. (2007). La competencia en comunicación audiovisual: dimensiones e indicadores. *Comunicar,* 29(15), 100-107. https://doi.org/10.3916/C29-2007-14

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

Frías-Guzmán, M. (2015). Tendencias de la multialfabetización en los albores del siglo XXI: Alfabetización mediática e informacional (AMI) como propuesta integradora. *Perspectivas em Ciencia da Informacao,* 20(4), 15-34. https://doi.org/10.1590/1981-5344/2393

García, H. (2015). Multialfabetización en la sociedad del conocimiento: competencias informacionales en el sistema educativo. *Revista Lasallista de Investigación,* 12(2), 225-241. Available at: https://www.redalyc.org/articulo.oa?id=69542291023 https://doi.org/10.22507/rli.v12n2a23

García-Roca, A. (2021). Los creepypasta como textualidades metaficcionales: oportunidades formativas para la alfabetización mediática e informacional. *Revista de Estudios Filológicos Tonos Digital,* 40. Available at: http://www.tonosdigital.es/ojs/index.php/tonos/article/view/2715/1195

Gómez-Pablos, V., Muñoz-Repiso, A.., Martín, S., & González, M. (2020). Evaluación de competencias informacionales en escolares y estudio de algunas variables influyentes. *Revista Complutense de Educación,* 31(4), 517. https://doi.org/10.5209/rced.65835

Gonzales-Miñán, M., Turpo-Gebera, O., & Suárez-Guerrero, C. (2020). La autopercepción de competencia mediática y su relación con las variables sociodemográficas del profesorado de tres instituciones educativas ubicadas en Lima. *Aula Abierta,* 49(2), 103-111. https://doi.org/10.17811/rifie.49.2.2020.103-11

Grizzle, A., Wilson, C., Tuazon, R., Cheung, C.K., Lau, J., Fischer, R. et al. (2021). Media and information literate citizens: think critically, click wisely! Available at: https://unesdoc.unesco.org/ark:/48223/pf0000377068/PDF/377068eng.pdf.multi

Gutiérrez-Martín, A., Pinedo-González, R., & Gil-Puente, C. (2022). Competencias TIC y mediáticas del profesorado. Convergencia hacia un modelo integrado AMI-TIC. *Comunicar*, 70, 21-33. https://doi.org/10.3916/C70-2022-02

Jenkins, H. (2006). *Convergence culture: La cultura de la convergencia de los medios.* Paidós. Available at: https://perio.unlp.edu.ar/catedras/comunicacionyrecepcion/wp-content/uploads/sites/135/2020/05/jenkins._introduccion._cultura_de_la_convergencia.pdf

Lopes, P., Costa, P., Araujo, L., & Ávila, P. (2018). Measuring media and information literacy skills: Construction of a test. *Communications-European Journal of Communication Research,* 43(4), 508-534. https://doi.org/10.1515/commun-2017-0051

Marín-Díaz, V., Sampedro, B., & Vega, E. (2017). Estudio psicométrico de la aplicación del internet addiction test con estudiantes universitarios españoles. *Contextos Educativos,* 2, 147-161. https://doi.org/10.18172/con.3067

Mateus, J., Andrada, P., González-Cabrera, C., Ugalde, C., & Novomisky, S. (2022). Perspectivas docentes para una agenda crítica en educación mediática post COVID-19. Estudio comparativo en Latinoamérica. *Comunicar,* 70, 9-19. https://doi.org/10.3916/C70-2022-01

Mateus, J., 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

Mateus, J., & Quiroz-Velasco, M. (2021). Futuros docentes peruanos frente a la educación mediática: entre la deuda y la esperanza. *Diálogos sobre educación,* 24(13), 1-19. Available at: http://dialogossobreeducacion.cucsh.udg.mx/index.php/DSE/article/view/900 https://doi.org/10.32870/dse.vi24.900

Mateus, J., & Suárez-Guerrero, C. (2017). La competencia TIC en el nuevo currículo peruano desde la perspectiva de la educación mediática. *EDMETIC,* 6(2), 129-147. https://doi.org/10.21071/edmetic.v6i2.6908

Ministerio de Educación (2016). *Currículo Nacional de Educación Básica.* Available at: http://www.minedu.gob.pe/curriculo/pdf/curriculo-nacional-de-la-educacion-basica.pdf

Ministerio de Educación (2018). Tipología y caracterización de las escuelas privadas en el Perú. *Estudios Breves,* 3. Available at: http://umc.minedu.gob.pe/wp-content/uploads/2019/01/EB03.pdf

Ministerio de Educación (2021). *Estadística de la Calidad Educativa*. Available at: http://escale.minedu.gob.pe/censo-escolar/-/document_library_display/oJ44/view/7019130;jsessionid=87eb0e9c3db9b1877b8c533cd8af

Orosco, J., Gómez, W., Pomasunco, R., Salgado, E., & Álvarez, R. (2021). Competencias digitales en estudiantes de educación secundaria de una provincia del centro del Perú. *Revista Educación,* 45(1). Available at: https://www.redalyc.org/articulo.oa?id=44064134008 https://doi.org/10.15359/ree.25-3.34

Pere, J., & Anguiano-Carrasco, C. (2010). El análisis factorial como técnica de investigación en psicología. *Papeles del Psicólogo,* 31(1),18-33. Available at: https://www.redalyc.org/articulo.oa?id=77812441003

Pérez-Rodríguez, A. (2020). Homo sapiens, homo videns, homo fabulators. La competencia mediática en los relatos del universo transmedia. *ICONO 14. Revista Científica de Comunicación y Tecnologías Emergentes,* 18(2), 16-34. https://doi.org/10.7195/ri14.v18i2.1523

Riva, A. (2019). La alfabetización mediática e informacional en la era del capitalismo de vigilancia. *Cuadernos del CLAEH,* 38(110), 323-344. https://doi.org/10.29192/CLAEH.38.2.15

Romero-Rodrigo, M., Gabarda-Méndez, C., Cívico-Ariza, A., & Cuevas-Monzonís, N. (2021). Las familias ante la encrucijada de la alfabetización mediática e informacional. *Innoeduca. International Journal of Technology and Educational Innovation,* 7(2), 46-58. https://doi.org/10.24310/innoeduca.2021.v7i2.12404

Sánchez, S., & Castellanos, U. (2021). Una mirada a las TIC desde la alfabetización mediática informacional (AMI) en el desarrollo educativo venezolano. *Atos de Pesquisa em Educação*, 16, e9967. Available at: https://bu.furb.br/ojs/index.php/atosdepesquisa/article/view/9967 https://doi.org/10.7867/1809-0354202116e9967

Santiago del Pino, M., Goenechea, C., & Romero, M. (2019). Enquiry to early formation Master in Secondary Teacher Education about the Informational and Media Literacy (IML). Design and validation of the survey. *Revista Complutense de Educación,* 30(4), 1045-1066. https://doi.org/10.5209/rced.60000

Su, Y., Lee, D., & Xiao, X. (2022). "I enjoy thinking critically, and I'm in control": Examining the influences of media literacy factors on misperceptions amidst the COVID-19 infodemic. *Computers in Human Behavior*, 128. https://doi.org/10.1016/j.chb.2021.107111

Turpo-Gebera, O. (2020). Alfabetización mediática e informacional y formación del profesorado peruano. In Aguaded, I., & Vizcaíno-Verdú, A. (Eds.), *Redes sociales y ciudadanía: hacia un mundo ciberconectado y empoderado* (435-443). Grupo Comunicar. Available at: https://redalfamed1.wixsite.com/redesyciudadania

Turpo-Gebera, O., Hurtado-Mazeyra, A., Díaz-Zavala, R., & Zarate-Yepez, J. (2021). Media and information literacy and digital citizenship in Peru: Approaches from university theses. *EDULEARN21 Proceedings* (6253-6261). https://doi.org/10.21125/edulearn.2021.1262

UNESCO (2013a). *Media and information literacy: Policy and strategy guidelines.* United Nations Educational. Available at: https://bit.ly/2SOpEKb

UNESCO (2013b). *Global Media and Information Literacy Assessment Framework: Country Readiness and Competencies.* Available at: https://unesdoc.unesco.org/ark:/48223/pf0000224655

Valle-Razo, A., Torres-Toukoumidis, A., & Romero-Rodríguez, L. (2020) Diseño de un instrumento para la evaluación de la alfabetización mediática en adolescentes. *Revista Colombiana de Ciencias Sociales,* 11(1), 28-55. https://doi.org/10.21501/22161201.3094

Wilson, C., Grizzle, A., Tuazon, R., Akyempong, K., & Cheung, C. (2011). *Alfabetización mediática e informacional. Curriculum para profesores.* Curriculum para profesores. UNESCO. Available at: https://unesdoc.unesco.org/ark:/48223/pf0000216099

Wilson, C. (2012). Alfabetización mediática e informativa: Proyecciones didácticas. *Comunicar,* 20(39),15-24. Available at: https://www.redalyc.org/articulo.oa?id=15823945002 https://doi.org/10.3916/C39-2012-02-01

Published by OmniaScience (www.omniascience.com)

Journal of Technology and Science Education, 2023 (www.jotse.org)