Classroom practices to promote critical thinking skills in the use of digital media[1]

Prácticas de aula para promover el pensamiento crítico en el uso de los medios digitales

https://doi.org/10.4438/1988-592X-RE-2022-398-557

Manuel Cañas Encinas
https://orcid.org/0000-0003-3056-6606

Ruth Pinedo González
https://orcid.org/0000-0002-4699-9433

Andrés Palacios Picos
https://orcid.org/0000-0003-4261-6981
Universidad de Valladolid

Abstract

In the twenty-first century, fake news, disinformation and information overload are a growing problem. The internet and social media contribute to their growth. To address this situation, the educational interventions of primary school teachers should make students aware of the issue and help them develop critical thinking skills, thus making them less vulnerable to digital media. Digital media education cannot be reduced to the use of technology. This study follows a quantitative design to analyse primary school teachers'

1 The work has been carried out within the framework of the research project «Truth and ethics in social networks. Perceptions and educational influences in young users of Twitter, Instagram and YouTube (Internética)» financed by the call of projects I+D+i of the Ministry of Science, Innovation and Universities of 2019 (PID2019-104689RB-I00). FPU20/00931.

Received: 02-02-2022 Accepted: 08-04-2022

perceptions of the classroom practices that promote critical use of technology in educational interventions. A survey using a scale based on thinking moves for the use of the internet and social media was designed and given to in-service primary school teachers (n=536) from various autonomous communities. The data collected were analysed descriptively. In addition, an analysis of variance and Student's *t*-test were performed. The results of the study suggest that there seems to be little planning of classroom activities for the subject under study. 90.6% teachers recognised that they planned few activities, or no activities at all, on disinformation. This may be the result of the lack of relevant teacher training. What is more, in the use of technology tools, mostly low-level cognitive strategies are encouraged. In their conclusions, the authors draw attention to the versatility of the scale designed and suggest integrating multiple thinking-based approaches, e.g., visible thinking, to enable teachers to learn how to promote critical thinking strategies beyond being wary of digital media.

Key words: disinformation, misinformation, teaching skills, critical thinking, media and information literacy, primary education.

Resumen

En el siglo XXI las *fake news*, la desinformación y la infoxicación son cada vez más populares. Internet y las redes sociales contribuyen a este crecimiento. Para hacer frente a esta situación, las intervenciones educativas de los docentes de Educación Primaria deben permitir que los alumnos conozcan esta problemática y desarrollen habilidades basadas en el pensamiento crítico para ser menos vulnerables a los medios digitales. La educación en medios tecnológicos no puede quedar reducida a los aspectos de uso y manejo. En este estudio se ha seguido un diseño metodológico cuantitativo para analizar la percepción del profesorado de Educación Primaria sobre sus prácticas de aula para promover el uso crítico de los medios tecnológicos en sus intervenciones educativas. Para ello, se ha diseñado una escala basada en los movimientos del pensamiento frente al uso de Internet y las RRSS. Ha sido cumplimentado por parte de los maestros en activo (n=536) de diferentes comunidades autónomas a las que se ha tenido acceso. Los datos recopilados se han analizado de manera descriptiva, y también se ha realizado un análisis de varianza y la prueba t de Student. Los resultados muestran que la planificación de actividades sobre el fenómeno de estudio en el aula parece ser escasa, pues un 90,6% de los profesores reconocen que planifican poco o nada actividades sobre la desinformación, pudiéndose deber a la necesidad de formación del profesorado. Además, en los diferentes cursos de la etapa se promueven principalmente estrategias de baja demanda cognitiva frente a los usos de los medios tecnológicos. Se concluye destacando la versatilidad de la escala diseñada, así como se propone la integración de enfoques basados en el pensamiento, como el pensamiento visible, para que los

Received: 02-02-2022 Accepted: 08-04-2022

docentes aprendan a promover estrategias de pensamiento crítico más allá de transmitir al alumnado que desconfíen de los medios digitales.

Palabras clave: desinformación, prácticas de aula, pensamiento crítico, alfabetización mediática e informacional, educación primaria.

Introduction

The rise of the internet and social media has increased the circulation of fake news and disinformation, at a time when multimedia devices are ever-present in everyday life (Buckingham, 2019; Gutiérrez & Tyner, 2012). Thus, the society of knowledge is giving way to the society of disinformation and information overload (Amorós, 2018). Romero-Rodríguez, Pulido & Rodríguez (2019) mention some of the risks of the inadequate use of digital media: information pollution and overload, fake news, clickbaits, and so on. According to Gutiérrez & Torrego (2018), this transforms citizens into digital castaways when it comes to using the internet or social media.

In the field of education, the need for both educators and students to develop critical thinking skills in the age of misinformation has become apparent, in order for them to handle the risks entailed by the use of digital media (Buckingham, 2019). To help students to acquire these skills, educators should be digitally literate first. The need for education to offer a way of neutralising the risks of fake news and disinformation is part of today's public debate (McDougall, Brites, Joao & Lucas, 2019).

However, as explained by Gutiérrez (2021), digital media are often used as learning resources rather than being the subject of critical analysis themselves. Educational interventions tend to focus on technology-related aspects instead of ideological or aesthetic concerns (Mateus, Hernández-Breña & Figueras-Maz, 2019).

Why should educators encourage the acquisition of skills that help students make critical use of media? According to Cebrián-Robles (2019), the fact that students have digital skills does not mean they are responsible, critical users of the internet and social media. Romero-Rodríguez et al. (2019) have coined the term *analfanautas* (illiterate net

Received: 02-02-2022 Accepted: 08-04-2022

surfers) to refer to users of information and communication technologies who lack the necessary skills to use these technologies adequately (p. 387). *Analfanautas*: (a) are proficient in technical and instrumental uses of technology; they have deep knowledge of platforms, devices and social media; (b) are loaded with more content than they can process – a situation leading to information overload; (c) prefer pseudo-information when consuming information on social media or digital platforms; and (d) tend to share content without analysing it first (Romero-Rodríguez et al., 2019).

In their review of the literature, Parra & Oliveira (2018) mention the solutions proposed for misinformation. These include media and information literacy. While information literacy "emphasises the importance of access to information and the evaluation and ethical use of such information" (Wilson, Grizzle, Tuazon, Akyempong & Cheung, 2011, p. 18), media literacy "emphasises the ability to understand media functions, evaluate how those functions are performed and to rationally engage with media for self-expression" (Wilson et al., 2011, p. 18). Lee (2018) and Shu et al. (2020) both suggest that media and information literacy can help mitigate the effects of disinformation and misinformation at an early age. According to García-Ruiz & Pérez-Escoda (2020), a new curriculum approach is needed to face this challenge and move towards critical media and digital literacy.

Ennis defines critical thinking as "reasonable reflective thinking focused on deciding what to believe or do" (1996, p. 166). Machete & Turpin construe the concept as "the ability to analyse and evaluate arguments according to their soundness and credibility, respond to arguments and reach conclusions through deduction from given information" (2020, p. 4). In both definitions, the emphasis is on reasonableness, reflection and the process of decision making (Ritchhart & Church, 2020).

Given these broad definitions, one could ask what the ideal critical thinker should be like. This study draws on the visible thinking approach, aimed at uncovering students' thinking on thinking and helping them develop metacognitive strategies (Ritchhart, 2015). One of the tools made available in this approach is thinking moves, i.e., the fundamental cognitive abilities involved in understanding, problem solving, decision making and judgement (Ritchhart, Church & Morrison, 2014): (a) observing closely and describing what is there; (b) building explanations and interpretations; (c) reasoning with evidence; (d) making connections;

Received: 02-02-2022 Accepted: 08-04-2022

(e) considering different viewpoints and perspectives; (f) capturing the heart and forming conclusions; (g) wondering and asking questions; and (h) uncovering complexity and going beyond the surface of things. These abilities can be associated with Castellví's state of alert (2019), i.e., the state of doubt and reflection when faced with information and social issues, as well as the continuous review of the underlying criteria.

The use of critical thinking against fake news, disinformation, misinformation, clickbaits and information overload has been dealt with in the literature (Díaz & Hall, 2020; Gallardo-Camacho & Marta-Lazo, 2020; Herrero-Diz, Jiménez, Frade & Aramburu, 2019; Machete & Turpin, 2020; Weiss, Alwan, García & García, 2020). The studies reviewed by Bronstein, Pennycook, Bear, Rand & Cannon (2018) show that belief in fake news is associated with reduced analytical thinking. Likewise, McDougall (2019) submits that fake news, disinformation or information overload are not an issue in themselves; the issue is the lack of critical thinking skills to face today's society. In the words of Jiménez, "if students do not develop the dispositions and skills required to deal with this type of information, the societies of the future will fall easy prey to manipulation, unable to identify fake news" (2020, p. 13).

In light of this, educators should be capable of empowering students in the age of misinformation, promoting the use of thinking moves to go beyond "what browsers show on their home pages" (Ernesto, 2013, p. 116). Accordingly, they must know how to promote "critical thinking in students, enabling them to identify and pick reliable information, as well as to classify and organise such information" (Gómez-Pablos, Muñoz-Repiso, Martín & González, 2020, p. 517). Once they learn how to identify the nature of the information they are dealing with, students can identify the point of view and other choices made by authors. Teachers should help them analyse and evaluate the information they are faced with, no less because the future of democracy hinges on their ability to do so (Hobbs, 2017; Hoechsmann, 2019). Critical thinking promotes "active, responsible and critical citizenship, as well as the ethical values need to make progress, both individually and socially" (Ventura, 2019, p. 71).

For students to achieve media and digital literacy, educators should resort to classroom practices designed for this purpose. The United Nations Educational, Scientific and Cultural Organization (UNESCO) has published a media and information literacy (MIL) curriculum for educators and learners under the title *Media and Information Literate*

Received: 02-02-2022 Accepted: 08-04-2022

Citizens: Think Critically, Click Wisely! (Grizzle et al., 2021). MIL learning outcomes include: to critically evaluate information, media and digital content; to analyse, share, organise and store information, media and digital content; to synthesise or operate on the ideas abstracted from information and media content; and to be able to protect oneself from risks online in relation to software, content, contacts and interaction, among others.

Against this background, and drawing on the concept of thinking moves, this study aims to:

- Design a tool to analyse educators' classroom practices to promote critical thinking in students when dealing with information in the use of the internet and social media.
- Analyse primary school teachers' self-perceptions regarding these issues.
- Consider the implications of the results obtained in the design of a teacher training proposal.

Method

This is a quantitative non-experimental study, following a cross-sectional design with a descriptive and inferential scope, gathering and analysing data to describe the phenomenon under study on the basis of in-service primary school teachers' perceptions (Hernández, Fernández & Baptista, 2018).

Sampling

The participants in this research study (n=536) were selected following the snowball sampling method, as the link to the data collection tool was sent by email to educational centres listed on the directories of autonomous communities/cities in Spain. The educational centre authorities were asked to share the survey with the educators in their school. Table I shows a description of the sample used in the study.

Received: 02-02-2022 Accepted: 08-04-2022

TABLE I. Sample description

	GENDER		AGE		GRADE LEVEL					
	Men	Wom-en	Mean	SD	1st	2nd	3rd	4th	5th	6th
Research (n=536)	29.70%	70.30%	43.48	9.49	11.20%	7.70%	9.30%	3.30%	11.60%	29.30%

Source: Own elaboration

Participants included educators from various autonomous communities/cities, mainly Madrid (34.90%), Castile-León (14.51%), Andalusia (10.59%), Asturias (9.41%), Canary Islands (6.67%), Aragon (6.67%), Murcia (6.27%) and Basque Country (4.31%).

Tools

For data collection, a Likert-type four-category scale was devised (where 1 meant "Strongly disagree" and 4 meant "Strongly agree"). Responses were collected between September and December 2021, using Microsoft Forms.

The scale included a set of items based on Ritchhart & Church's thinking moves (2020), adapted for misinformation in the use of the internet and social media, taking into account the contributions made by Amorós (2018), Hobbs (2017), Jiménez (2020) and Gutiérrez (2021). Sociodemographic items were added for sample description purposes, in addition to relevant general items.

A preliminary survey was devised and tested among 10 educators. The pilot test showed the scale had an adequate number of items (14 to 20). Some of the items were rephrased to make them easier to understand, while others were deleted. In its final version, the survey included 4 sociodemographic questions (age, gender, province and grade level), 3 general items ("I think the subject of fake news, disinformation and information overload should be addressed at the stage in which I teach"; "I plan activities or strategies to address fake news, disinformation and information overload for my educational interventions with my students"; "I'd like to get further training on fake news, disinformation and information

Received: 02-02-2022 Accepted: 08-04-2022

overload to be able to address this subject in the classroom") and 15 items focusing on cognitive strategies (see Table II).

The scale was validated by 6 judges – experts, researchers, and university and non-university educators with an average age of 43 and at least 15 years' professional experience.

After the survey responses for the total sample were collected, the properties of the measurement tool – titled Critical Thinking for Digital Media Classroom Practices Scale (CTDMCPS) – were analysed in depth. For internal consistency, Cronbach's alpha was used. The high value – .97 – indicated internal consistency. In addition, the method of exploratory factor analysis (EFA) was used to uncover the underlying structure of the variables used. Further tests confirmed the validity of this analysis (KMO=.96; chi-square=7036.505, SIG=.000), which showed that the scale had one main factor – Critical thinking –, accounting for 67.12% total variance (see Table II). This factor includes the various cognitive strategies involved in the development of critical thinking in students.

Received: 02-02-2022 Accepted: 08-04-2022

TABLE II. Scale items

	Component	Factor
Identify the various viewpoints and perspectives in the information found when surfing the internet.	.876	Critical thinking
Check the reliability of the most viral or repeated information on the internet.	.869	
Analyse the reliability of information sources (websites).	.858	
Check authors and sources for the information found on the internet.	.843	
Give evidence of the consistency or the reliability of the information found on the internet.	.841	
Read beyond attention-grabbing headlines or images on the internet.	.839	
Identify biases in the information found and shared on the internet, based on one's own beliefs or feelings.	.839	
Ask questions about the information found on the internet.	.825	
Make connections between different pieces of information found on the internet.	.809	
Summarise and get the gist of the information found on the internet.	.808	
Check publication dates for the information found on the internet.	.808	
Compare and contrast information across websites.	.801	
Identify ideologies, biases and assumptions underlying the information shared on the internet.	.768	
Share information found on the internet only after checking that it is reliable.	.753	
Distrust the information published on the internet.	.738	
Eigenvalues	10.07	
% variance explained	67.12	
% cumulative variance explained	67.12	
KMO	.963	
Bartlett's Test of Sphericity	Chi-square=7036.505; SIG=.000	

Source: Own elaboration

Received: 02-02-2022 Accepted: 08-04-2022

The questionnaire's validity was checked with a confirmatory factor analysis (CFA) for the survey's 15 items, using a one-factor model. The results are shown in Table III. The chi-square value is statistically significant, mainly due to sample size. Moreover, the root mean square error of approximation (RMSEA), as a mechanism for adjusting for sample size, reveals that the model adequately fits this kind of measurements (Browne & Cudeck, 1993). The values for the goodness of fit index (GFI) and the adjusted goodness of fit index (AGFI) – absolute fit indices – exceed the minimum of .9 generally indicating acceptable model fit (Bentler & Bonett, 1980). As to the normed fit index (NFI) and the non-normed fit index (NNFI), analysing the discrepancy between the chi-squared value ($\chi 2$) of the hypothesised model and the chi-squared value of the null model, their values are above the cutoff of .90 or greater indicating good model fit (Bentler & Bonett, 1980; Bollen & Long, 1993). Finally, as to the AGFI value – same index as GFI but adjusted for degrees of freedom –, it is close to 1 (perfect fit) and way above 0.8 (acceptable model) (Bentler & Bonett, 1980).

Based on the EFA measurements described above, it can be concluded that CTDMCPS is a valid construct.

TABLE III. Confirmatory factor analysis

	MEASUREMENTS						
	Absolute fit indices		**Incremental fit indices**				**Parsimony-adjusted measures**
	$\chi 2$	**RMSEA**	**GFI**	**CFI**	**NFI**	**NNFI**	**AGFI**
Factor analysis model of CTDMCPS for one factor of interest	224.31 (SIG = .000)	.058	095	.99	.99	.99	.92

Source: Own elaboration

Received: 02-02-2022 Accepted: 08-04-2022

Data analysis

The quantitative analysis includes a statistical description of the relevant variables and an inferential mean difference comparison after variable standardisation, analysis of variance (ANOVA) and Student's *t*-test for related samples. All statistical analyses were performed with SPSS Statistics, version 26.0. To check the reliability and validity of the measurement tool, SPSS 26.0 was used along with LISREL 8.80, a statistical software package used in structural equation modelling.

Results

Firstly, a descriptive analysis was performed of the initial questions in the survey. The results are evidence of the little work done in the classroom in connection with fake news, disinformation and information overload ($\overline{X}$=1.92, SD=.84). 90.6% participants either strongly disagreed or barely agreed with the planning of activities in this area, although they considered the subject to be relevant in primary education ($\overline{X}$=3.11, SD=.83). 84.5% quite agreed or strongly agreed with the latter. These results could be accounted for by the training shortcomings in the area ($\overline{X}$=2.90, SD=.84). In fact, 60.7% respondents quite agreed or strongly agreed with getting further training.

The Student's *t*-test applied to related samples showed that mean differences were statistically significant between the importance attached and the planning of activities ($t_{(2)}$=13.77; SIG=.000), the importance attached and training ($t_{(2)}$=4.18; SIG=.000), and training and activity planning ($t_{(2)}$=9.90; SIG=.000).

Secondly, the 15 items related to cognitive strategies were analysed descriptively. The items with the highest frequency were "Distrust the information published on the internet" ($\overline{X}$=2.91, SD=.97), "Read beyond attention-grabbing headlines or images on the internet" ($\overline{X}$=2.66, SD=.95) and "Ask questions about the information found on the internet" ($\overline{X}$=2.63, SD=.92), whereas those with the lowest frequency were "Give evidence of the consistency or the reliability of the information found on the internet and social media" ($\overline{X}$=2.16, SD=.95), "Identify biases in the information found and shared on the internet and social media, based on one's own beliefs or feelings" ($\overline{X}$=2.15, SD=.94) and "Identify ideologies, biases

Received: 02-02-2022 Accepted: 08-04-2022

and assumptions underlying the information shared on the internet and social media" ($\overline{X}$=2.14, SD=.96) (see Table IV). These results show that the strategies promoted are those with a low level of complexity or cognitive demand (see Table IV).

TABLE IV. Total scale scores and percentage of responses

Scale item	Mean	Standard deviation	Never (%)	Occasionally (%)	Often (%)	Very often (%)
Distrust the information published on the internet.	2.91	.97	10.0	21.7	35.6	32.7
Read beyond attention-grabbing headlines or images on the internet.	2.66	.95	13.2	28.1	37.8	20.9
Summarise and get the gist of the information found on the internet.	2.63	.92	14.4	27.4	42.1	16.1
Ask questions about the information found on the internet.	2.60	.93	12.8	29.7	38.8	18.7
Check the reliability of the most viral or repeated information on the internet.	2.44	.98	19.7	32.7	31.3	16.3
Check authors and sources for the information found on the internet.	2.41	.99	21.3	31.9	31.1	15.7
Analyse the reliability of information sources (websites).	2.39	.98	20.7	34.6	29.3	15.4
Compare and contrast information across websites.	2.35	.98	21.7	36.2	27.2	15.0

Received: 02-02-2022 Accepted: 08-04-2022

Identify the various viewpoints and perspectives in the information found when surfing the internet.	2.33	.95	22.4	33.3	32.9	11.4
Check publication dates for the information found on the internet.	2.29	.96	22.8	38.2	26.0	13.0
Share information found on the internet only after checking that it is reliable.	2.27	1.02	28.7	28.9	28.7	13.6
Make connections between different pieces of information found on the internet.	2.23	.94	24.6	38.0	27.0	10.4
Give evidence of the consistency or the reliability of the information found on the internet.	2.16	.95	29.3	35.2	26.0	9.4
Identify biases in the information found and shared on the internet, based on one's own beliefs or feelings.	2.15	.94	28.5	37.8	24.0	9.6
Identify ideologies, biases and assumptions underlying the information shared on the internet.	2.14	.96	30.5	35.4	24.0	10.0

Source: Own elaboration

Interestingly, the percentages of "Often" and "Very often" responses shown in Table IV reveal that 68.3% participants consider they encourage students to be wary of the information published on the internet. Likewise, 58.7% believe they urge students to read beyond attention-grabbing headlines or images, while 58.2% insist on the importance of summarising the information found online.

On the other hand, 61.0% participants "Never" or only "Occasionally" focus on the publication dates of the information published online; 64.5%

"Never" or only "Occasionally" insist on giving evidence of how consistent or reliable the information read online is; and 65.9% "Never" or only "Occasionally" promote the identification of underlying ideologies, biases and assumptions.

The average total score on the scale is 35.98 (SD=11.82). Table V shows the average total score for each grade in primary education. The score for the promotion of critical thinking strategies is higher for higher grades. The analysis of variance for one factor reveals that the differences are statistically significant.

TABLE V. Total scale scores by primary education grades

Primary education grade	Mean	Standard deviation	DF	F	SIG
1st	30.26	11.64	5	11.715	.000
2nd	31.41	10.74			
3rd	31.57	9.93			
4th	34.82	13.88			
5th	36.39	10.34			
6th	40.79	10.98			

Source: Own elaboration

On the basis of these results, it was analysed whether more emphasis was laid on certain cognitive strategies than on others, either throughout the stage as a whole or in individual grades. However, the promotion of strategies in all grades matches the results shown in Table IV, the average total score being higher for higher grades.

Likewise, as expected, the analysis of variance for one factor shows that the total score for the promotion of cognitive strategies is higher when there is more planning of classroom activities on fake news, disinformation and information overload (see Table VI).

Received: 02-02-2022 Accepted: 08-04-2022

TABLE VI. Relationship between activity planning and cognitive strategies

Planning strategies or activities to raise awareness of fake news, disinformation and information overload	Mean	Standard deviation	gDF	F	SSIG
Strongly disagree	29.93	11.12	3	43.407	.000
Barely agree	36.86	9.99			
Quite agree	41.05	10.98			
Strongly agree	50.88	9.71			

Source: Own elaboration

Conclusions

The ubiquity of the internet and social media in everyday life means greater access to knowledge and communication, but also greater risks in terms of information pollution, fake news and clickbaits (Romero-Rodríguez et al., 2019). Educational centres and teachers play a key role in facing these risks, teaching the thinking skills and dispositions required for critical use of media. In line with this, the European Union promotes the development of a high-performing European digital education system and seeks to enhance citizens' competences and skills for the digital transition (European Education Area, 2021). Likewise, UNESCO lists seven media and information literacy (MIL) competences for teachers (Grizzle et al., 2021):

1. Understanding the role of information, media and digital communications in sustainable development and democracy.
2. Understanding content and its uses.
3. Accessing information effectively and efficiently and practising ethics.
4. Critically evaluating information and information sources and ethical practices.
5. Applying digital and traditional media formats.
6. Situating the sociocultural context of information, media and digital content.

Received: 02-02-2022 Accepted: 08-04-2022

7. Promoting MIL among learners/citizens and managing required changes.

These competences are needed to promote critical use of digital media among primary school students. In fact, the goal of stage (1) set forth in Organic Law 2/2006, of 3 May, on Education (LOE), amended by Organic Law 3/2020, of 29 December, is to develop students' ability to "get started in the use of information and communication technologies and to build critical thinking to analyse the messages they receive and produce". With such an ambitious goal, we need to be aware of its implications in the classroom.

Moving towards this goal, this study involved the design and validation of a tool to assess teachers' classroom practices promoting critical thinking in the use of the internet and social media. The tool – a scale – has such psychometric properties that make it valid and reliable. The scale can serve a variety of purposes: (1) for the institutions designing initial and in-service teacher training plans, the survey can offer valuable data for efficient planning, enabling them to identify areas for improvement in the knowledge of specific strategies to promote critical use of media in students; (2) for teacher training centres, it can help identify changes in teacher training and show evidence of improvement; (3) for teachers, it can be a checklist used to plan and check the critical thinking strategies promoted among students in the use of media; and (4) for learners, it can be an information management checklist for research and other learning projects.

In addition, the study analyses primary school teachers' self-perceptions in connection with the development of classroom practices to train critical users of digital media. The survey reveals that most teachers do not plan activities to promote the acquisition of specific cognitive strategies to analyse the information found on the internet and social media, even if they consider this to be very important and are interested in getting relevant training. These results concur with the findings of Gretter & Yadav (2018) and Gutiérrez-Martín, Pinedo-González & Gil-Puente (2022), where educators state that they lack training in media literacy, an issue they consider to be highly relevant in today's world.

In light of these results, special and practical training is needed for educators to be able to face educational challenges in a post-truth society – a kind of training that is consistent with the EU approach (European Education Area, 2021) and with the conclusions of current scientific

Received: 02-02-2022 Accepted: 08-04-2022

studies (Barzilai & Chinn, 2020; Mateus, 2021). Although this study does not explore the reasons why teachers do not include critical thinking strategies as part of their learning activities, it could be posited that the failure to do so is related to the lack of adequate training and, thus, of the relevant skills. As stated by Swartz, Costa, Beyer & Reagan (2018), critical thinking skills can be infused with any content. Therefore, if a teacher is adequately trained to promote critical thinking strategies, they can use them with all kinds of curriculum content (e.g., Science or Mathematics), as well as with content found on the internet or in social media (e.g., fake news).

When analysing teachers' self-perceptions in connection with the promotion of cognitive strategies for critical use of media at the level of information, it can generally be observed that teachers resort to cognitive strategies to help students analyse the information found in digital media only occasionally, especially those strategies with a higher level of cognitive complexity (e.g., "Give evidence of the consistency or the reliability of information" or "Identify biases in the information found and shared on the Internet and social media, based on one's own beliefs or feelings").

The strategy most commonly promoted seems to be the distrust of the information published on the internet. This is important, as it could be the starting point for other strategies leading to an in-depth critical analysis of media information: if there is no distrust, there can be no move towards checking the truthfulness of information. However, this is a low-level cognitive strategy, associated with a protective or preventive approach against the risks of digital media (Botturi, 2019). Therefore, it is not an effective tool for empowering students to face the risks posed by information. Moreover, an excess of distrust could damage the learning process, as digital media also contain trustworthy information (Amorós, 2018).

The study also considers if the promotion of specific cognitive strategies for critical use of media changes according to grade levels, finding that teachers devote more effort to this area in higher grades, especially fifth and sixth grades. However, even in higher grades, the cognitive strategies preferred are still superficial instead of more complex ones. It would be preferable for teachers to focus on higher-level strategies in higher grades, enabling learners to perform more sophisticated analyses of the information they read (Ritchhart & Church, 2020). Still, although the need

for critical thinking skills is more urgent in higher grades, it should be borne in mind that today the use of digital media, including social media, begins at an early age (INE, 2021), which means that work on adequate strategies should begin in first grade.

Primary school students are frequent users of the internet and social media – even of those media that are not fit for their age. This is a fact that school communities, and teachers in particular, cannot ignore. What could happen if they were not taught cognitive skills frequently? They could settle for the first information they found on the internet or in social media, failing to compare it to other pieces of information and failing to check who shared such information and when, thus spreading wrong or biased information. For instance, summarising and getting the gist of the information found on the internet would not be enough if the information were not true or had not been checked. This, in fact, would make children even more vulnerable to the risks of misinformation.

Finally, the study reflects the relationship between the planning of learning activities in the area under study and the development of cognitive strategies. This relationship highlights the need to address media and digital literacy in the classroom, with specific goals and activities, and in coordination with colleagues at the educational centre (Aguaded, Marin-Gutiérrez & Díaz-Parejo, 2015; Alonso-Ferreiro & Gewerc, 2018; Kerslake & Hannam, 2022; Mateus, 2021; Sánchez-Carrero, 2020).

A training proposal should be put forward to enable teachers to promote critical thinking strategies in students, thus helping them fight disinformation and other dangers. This study offers a measurement tool and useful data to move in this direction. The scale can be used by teachers as a list of strategies to be developed in the context of a teaching unit or a classroom project. In addition, they could use the visible thinking approach and its thinking routines in situations of misinformation, to create real-life or fictional scenarios where the use of technology requires the development of strategies, and so on. The proposal is in line with the COMPROMETIC model put forward by Gutiérrez-Martín et al. (2022). Also, the UNESCO MIL Curriculum offers methodological strategies that can be used as a reference in the classroom (Grizzle et al., 2021).

As to the limitations of the study, the sampling method used does not guarantee a random or a representative sample; neither does it ensure control of how the sample is formed. Moreover, a larger sample could be used. Future lines of research could look into the impact of training

Received: 02-02-2022 Accepted: 08-04-2022

proposals based on critical thinking in the use of digital media on disinformation, information overload and other phenomena. In addition, similar studies could be conducted in other levels of education (e.g., secondary education, Spanish Baccalaureate, basic occupational training, etc.)

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Contact address: Manuel Cañas Encinas, Universidad de Valladolid, Facultad de Educación, Departamento de Psicología. Pl. de la Universidad, 1, C.P., 40005, Segovia. E-mail: manuel.canas@uva.es

Received: 02-02-2022 Accepted: 08-04-2022