

CRACKING THE CODE OF MISINFORMATION: EMPOWERING YOUTH THROUGH MEDIA LITERACY EDUCATION

Oliver Klawitter¹, Claudia Grümpel²

1. University of Erfurt, 2. University of Alicante

1. INTRODUCTION

The challenges and opportunities of an increasingly digital world characterised by algorithms (Kerres, 2018) highlight the need for digital competences and skills in school education, with a priority on the development of new pedagogical approaches. The demand for analytical skills and critical thinking is regaining prominence in educational discourse, as teachers' associations increasingly advocate for transversal critical thinking. Limitless opportunities for opinion formation through interaction are offered by the use of social media in public and private life. In addition, the role of authorship in the media has undergone a radical change as everyone is able to use social media to share their own opinions or the opinions of others online. During adolescence, the formation of opinions is influenced by various social factors, underlining the importance of educating young people to be critical in order to promote well-considered opinions. It is therefore essential to acquire media literacy skills that allow the authenticity of information to be verified as a critical, educational and responsible process. Media literacy thus becomes a crucial component of secondary education in today's context.

2. OBJECTIVES

The early use of multimedia requires the assimilation of critical media literacy and awareness. It has become commonplace to have unlimited and instant access to knowledge. Reflection on media literacy and systematic selection based on various criteria is required in the face of the vast number of unfiltered sources of information, such as

- Adopting a critical attitude to the reception of news
- Applying digital tools

- Verifying the accuracy of news
- Contrasting independent sources for critical analysis
- Checking linguistic references and the correct contextualisation of news.

Fact-checkers, which are media verification platforms, are also guided by these criteria. A number of these platforms exist, including *Newtral*, *correctiv.org* and *lasexta*, which compare information and misinformation and check their accuracy. Behind every misinformation detection platform you will find an editorial team, which checks the information. It would be desirable, and a didactic objective, for students to be able to reconstruct and verify these same procedures themselves. This process of critical reception is a competence that should be taught alongside digital competence in class.

Schools have a responsibility to go beyond digital literacy and to educate students in this holistic process, which is understood as an interaction between the systematisation of knowledge and the critical selection of it.

3. THEORETICAL CONSIDERATIONS

Media literacy is a subset of communicative competence (Baacke, 1997, 2007). Media literacy is also a set of tools that, according to Bourdieu (1979), generate cultural capital capable of transforming our relationship with the world and ourselves through a process of transformation. A critical use of media requires a habit based on various pedagogical and sociological concepts (Bourdieu, 1979; Bohnsack, 2009; Bohnsack, Nentwig-Gesemann & Nohl, 2013; Schäffer, 2003, 2005). A habit is not rigid, but is derived from our previous experiences. In this sense, the determinants of our early experiences form a framework that is expanded with new experiences in social spaces (Mannheim, 1980). These new social experiential spaces expand our old experiences and their limitations, but leave the initial determinants unchanged. Therefore, early shared experiential spaces constitute groups of individuals with similar selection criteria (Bourdieu, 1987, p. 113).

The concept of habit thus provides a framework for describing culture, education, training and their possible processes of transformation. In a didactic context, it is about the possibility of learning competences through the formation of a habit that leads to media literacy as a result of an educational process. It is a matter of the development of protocols with the aim of the automation of the individual verification process.

4. METHODOLOGY

As discussed by Mannheim in relation to a shared space of experience, such as the experience of the Covid-19 pandemic (Hurrelmann & Bauer, 2020), a sociological differentiation of generations is justified here. The current generation of students can be divided into Generation Z and Generation Alpha. Generation Alpha comprises those born between 2011 and 2025, while Generation Z comprises those born between 1997 and 2012. The distinction between Generation Z and Generation Alpha is based on age and the use of smartphones and social media. Generation Alpha is the first generation to have been exposed to digital devices from an early age, with parents who were also users. Generation Z also had their first contact with digital media in early childhood, but their parents started using these devices later (Süss, Lampert, & Wijnen, 2010).

The development of new didactic approaches to media literacy in schools should not be based solely on digital skills, but rather on the process of critical selection of data available on the internet. In an image-based multimedia culture, the selective reception process is influenced by visual stimuli, among others (Hoffmann, 2020).

The method presented consists of different procedures. On the one hand, images and videographies are described using the documentary method (Bohnsack 2009; Kanter 2016), and on the other hand, they are transversally complemented with a series of didactic questions. The documentary method for images consists of two interpretations, the formulated and the reflective, based on artistic theories such as the iconographic and iconological method of Erwin Panofsky (1975) and Max Imdahl (1994). The first step in this process is the formulated interpretation, which focuses on the "what" and reconstructs the generalised communicative knowledge. This level comprises two interpretations: the pre-iconographic and the iconographic. The pre-iconographic level describes what is visible in the image (objects, phenomena and movements). It does not take into account cultural or social knowledge. The composition of the image is described, for example, foreground, middle ground and background. If the image contains people, their age is estimated and their clothing, hairstyle, gestures and facial expressions are described (Bohnsack, 2009). The identification of actions provides a crucial basis for interpretation at the second level, the iconographic level. At this iconographic level, the theme or subject of the image is formulated and motifs are assigned to the movements.

The second step in this process is the reflective interpretation, which focuses on the "how". The reflective interpretation is divided into the formal composition (shots, scenes and perspectives) and the iconological-iconic level, which describes paradoxes and curiosities. When several images are analysed, a comparative analysis is carried out. In a final stage, a typology is established.

In this didactic concept, we outline the different steps of formulated interpretation (what) and reflective interpretation (how), complemented by a series of questions (where, when, why, who). These questions are at the heart of communicative knowledge and, through the routine repetition of the procedure, it becomes conjunctive knowledge and, therefore, a pedagogical habit and a critical attitude or critical thinking. In other words, this conjunctive knowledge is characterised by shared experiences between actors. Acquired in a shared environment (classroom) and through practical application, this knowledge is recognisable by congruent habits or immediate understanding among peers.

In summary, the documentary method follows the following steps: (1) formulated interpretation, (2) reflective interpretation, (3) comparative analysis and (4) typology.

In this paper, we use a single image to demonstrate the two complementary approaches to media literacy. The first approach to the image is through detailed descriptions of the images (pre-iconographic level, iconographic level, formal composition, iconological level and iconic level). In a second approach, the results are cross-categorised into different categories of misinformation (Table 2).

Media literacy should be developed within a pedagogical approach that uses two complementary methods. The first is aimed at improving the ability to perceive details, following the documentary method (see Table 1). Table 3 serves as a protocol for autonomous verification of information/misinformation.

The aim of this section is to present concrete strategies for the verification of the content of images by means of a didactic protocol. Table 2 provides a simplified classification based on the results found on the fact-checking platform (*correctiv.org*).

Table 1. Procedure of the documentary method for image interpretation.

Documentary method for the interpretation of images	
1. Formulated interpretation (what):	2. Reflected interpretation (how):
a) Pre-iconographic level <ul style="list-style-type: none"> - Capturing objects, phenomena and movements - Foreground, mid-ground and background of the image 	a) Formal composition <ul style="list-style-type: none"> - planimetric composition - scenic choreography - perspective projection
b) Iconographic level <ul style="list-style-type: none"> - formulation of the pictorial theme - motifs 	b) Iconological and iconic interpretation <ul style="list-style-type: none"> - elaboration of paradoxes and curiosities
3. Comparative analysis	
4. Typology formation (assignment)	

Source: Bohnsack, 2009.

Table 2. Classification of misinformation. Source: correctiv.org, 2018.

(1) Correct	(2) Not documented
(3) Partially correct	(4) Largely incorrect
(5) Incorrect context	(6) Manipulated
(7) Incorrect	(8) Invented

5. APPLICATION OF IMAGE ANALYSIS METHODS IN THE CLASSROOM

We have chosen an image on climate change to illustrate the two processes. The image was published and shared on Twitter and represents misinformation in text and image.

Table 3. Information Verification Protocol.

Phase 1: Interpretation based on the documentary method	
what	description of objects and actions
how	description of the composition and curiosities
Phase 2: Digital verification of results	
where	location: verification of the location (reverse image search)
when	time: Verification of the publication date
why	causality: identification and verification of the issue

5.1 Image interpretation

Photo 1. Explosion on highway



The documentary procedure begins with the formulated interpretation of photo 1, asking "what". This question is used to describe objects, phenomena and movements in Photo 1 (Table 4).

Table 4. Interpretation of photo 1 based on the documentary method.

Photo 1: Explosion on highway	
Documentary method for the interpretation of images	
1. Formulated interpretation (what):	2. Reflected interpretation (how):
<p>a) Pre-iconographic level</p> <p>We see a six-lane highway with two directions. Both directions are separated by a low solid wall barrier. On that elevation, we observe several street lamps.</p> <p>On the right side, we observe a jet flame with an explosion as high as a building. There are numerous black containers in front of the flames. Close to the flames on the left side next to the fire there is an abandoned car. On the right-hand side, the highway is lined by a forest. On the left direction of the highway, there are two high buildings in the background. The sky is gray.</p>	<p>a) Formal composition</p> <ul style="list-style-type: none"> - planimetric composition - scenic choreography - perspective projection <p>The photo is divided into two hemispheres, the left and right lanes, with the right side dominated by the yellow-red gas explosion. The two three-lane roads can be seen in the foreground, narrowing towards the back and forming a vanishing point in the first third of the horizon. In the foreground, black spots might be domestic gas bottles, which seem to be the reason for the explosion.</p> <p>Two thirds of the background are dominated by the gray sky. The first perspective of the scenic choreography of the street suggests the dynamics of a car moving towards the gas explosion.</p> <p>The scenic choreography suggests that the video has been recorded by a security camera placed on a highway lamp or by another driver from his car.</p>
<p>b) Iconographic level</p> <p>Formulation of the subject</p> <p>The scenery shows an accident on a highway that has caused a large explosion with high flames. The photo seems to have been taken shortly after the tragedy, in the direction of the explosion. On the ground we can see some containers, which could be gas cylinders, with yellow flames coming out of them, which seem to be the cause of the big explosion. The cars in the left lane are parked, keeping a safe distance from the direction of the explosion. The dark clouds in the sky indicate that the explosion has just taken place.</p>	<p>b) iconological and iconic interpretation</p> <p>Elaboration of paradoxes and curiosities.</p> <p>The image shows an explosion with flames as high as a building. This dimension is indicated by the contrast between the car next to the flames and the height of the buildings in the background. The size of the explosion and fire indicates that the cause was gas. In the foreground of the photo there is evidence of gas cylinders, probably from a lorry involved in a traffic accident.</p> <p>The suggestion of misinformation relating the explosion to cars with electric motors is absurd, since an explosion of a vehicle engine would be much smaller in magnitude.</p>
3. Comparative analysis	
4. Typology formation (assignment)	

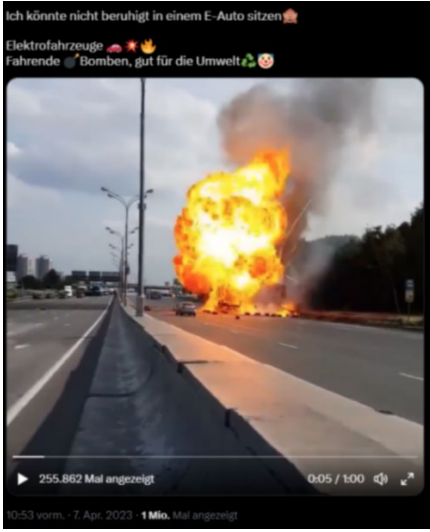
5.2 *Verification of photo 1: Explosion on highway*

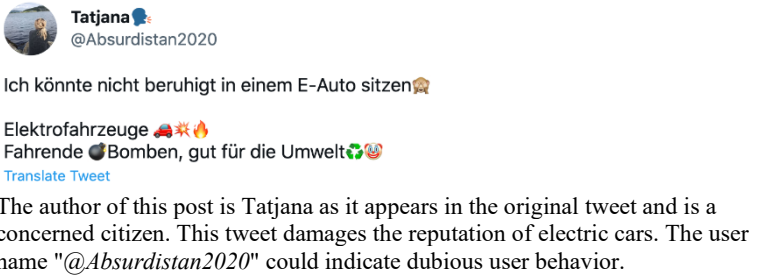
The "what" and "how" questions guide the detailed description of the photo (Table 4), which can be done in groups or individually. A reverse photo search guided by supplementary questions (Table 3) verifies the photo.

Table 5 outlines two processes, the documentary interpretation of the image and the digital verification, as an example of a pedagogical approach. In the first process, the questions of "what" and "how" have been addressed in a detailed description of the image. An extended online search, a reverse image search, verifies the image in the subsequent process. A series of "where, when, why" questions are used in this second process.

If the answers contradict each other in terms of place, time and causality, there is evidence of misinformation. In the case of photo 1, the results of the questions show that the misinformation belongs to two categories: incorrect context (5) and manipulated context (6) as it is referred to in Table 2. For a final reflection on the results, the question "who" is used to identify the author and his intention to polarise on climate change. Students' findings are compared with those of fact-checkers (such as *correctiv.org*). This procedure promotes sensibility in media literacy and fosters a critical habit regarding reception and evaluation of news.

Table 5. Photo 1 verification protocol.

Phase 1: Interpretation of photo 1 on the basis of the documentary method	
what	Formulated interpretation (Table 6, 1a, 1b)
how	Reflective interpretation (Table 6, 2a, 2b)
Phase 2: Digital verification of the results	
where	Localisation: A reverse image search shows that the video distributed online is not recent and does not show an explosion of an electric car. It can be found, in a Youtube video from 2017 from Russia.
	
when	Timing: Verification of the date of publication. A reverse image search shows that the video is not recent and does not present an explosion. This is proven by a Youtube video from 2017 whose title indicates that the video has been recorded in Russia. The video shows gas bottles on a truck crashing into another vehicle.
why	Causality: identification and verification of the issue The photo can be classified as published in the wrong context. The video shows a truck loaded with gas bottles exploding after a traffic accident in Moscow. This means the explosion is not related to an electric vehicle. Images of exploding cars and other vehicles are often associated with electric cars, as supposed by the post.

<p>who</p>	
<p>Results</p>	<p>The image and text confirm that this is visual misinformation due to the use of a wrong context. The image was deliberately released in the wrong temporal context to suggest that the explosion was caused by a defective electric car. Originally, the used photo was found in the context of a gas explosion on a highway in Russia, ten years ago.</p>

6. CONCLUSION

This chapter considers media literacy focusing on the goals of critical habit regarding digital tools, accuracy of information, critical analysis and proper contextualization of news and images.

Acquiring a critical habit during the reception process requires the verification of content and images not only by digital tools, but by appropriate methodologies. There have been proposed two complementary procedures. The first has been based on the documentary method ('what' and 'how') and the second has been based on a contextual verification method ('where', 'when' and 'why').

Media awareness can be improved through classroom projects, as detailed in Table 5, following the proposed didactic protocol that applies independent reconstruction through reverse image search. The application of such didactic protocols in the classroom promotes a critical receptive process of young people, fostering routines in checking textual and visual data in terms of time, place and context. Autonomy in this process leads to students taking responsibility for their receptive process and in particular for deciding whether or not to share content, which defines a crucial aspect in the reformulation of media literacy. A critical approach in the reception process also means rejecting misinformation and not spreading it on social media.

7.BIBLIOGRAFÍA

- Bohnsack, R. (2009). *Qualitative Bild- und Videointerpretation. Die Dokumentarische Methode*. Opladen & Farmington Hills.
- Bohnsack, R., Nentwig-Gesemann, I., Nohl, AM. (2013). Die dokumentarische Methode und ihre Forschungspraxis. En: Bohnsack, R., Nentwig-Gesemann, I., Nohl, AM. (Eds.) *Die dokumentarische Methode und ihre Forschungspraxis*. VS Verlag für Sozialwissenschaften, Wiesbaden. https://doi.org/10.1007/978-3-531-19895-8_1
- Bourdieu, P. (1987): *Sozialer Sinn: Kritik der theoretischen Vernunft*. Fráncfort del Meno: Suhrkamp.
- Bourdieu, P. (1979): *Entwurf einer Theorie der Praxis auf der ethnologischen Grundlage der kabyliischen Gesellschaft*. 1. edición, Frankfurt del Meno: Suhrkamp; Bourdieu, P. (1982): *Die feinen Unterschiede. Kritik der gesellschaftlichen Urteilskraft*. Frankfort del Meno: Suhrkamp.
- Hoffmann, J. (2020). Spielen, Lernen oder Arbeiten? Kindlich Bild(erbuch)-Rezeptionsprozesse aus studentischer Perspektive in der Lern- und Forschungswerkstatt Grundschule an der TU Dresden. En: *Spielen, Lernen, Arbeiten in Lernwerkstätten: Facetten der Kooperation und Kollaboration* (pp. 40-53). Julius Klinkhardt.
- Hurrelmann, K., & Bauer, U. (2020). *Einführung in die Sozialisationstheorie. Das Modell der produktiven Realitätsverarbeitung*. 13. Edición. Weinheim: Beltz Juventa.
- Imdahl, M. (1994). Ikonik. Bilder und ihre Anschauung. En: Boehm, Gottfried (Ed.): *Was ist ein Bild?* Munich, p. 300-324.
- Kanter, H. (2016). *Ikonische Macht: Zur sozialen Gestaltung von Pressebildern*. En: *Sozialwissenschaftliche Ikonologie: Qualitative Bild- und Videointerpretation*, 7. Opladen: Barbara Budrich. <https://doi.org/10.3224/84740146>
- Kerres, M. (2018). *Mediendidaktik. Konzeption und Entwicklung digitaler Lernangebote*. 5. Edición. Berlin; Boston: De Gruyter Oldenbourg.
- Mannheim, K. (1980). *Strukturen des Denkens*. Fráncfort del Meno.
- Nentwig-Gesemann, I. (2001): *Die Typenbildung der dokumentarischen Methode*. En: Bohnsack, R., Nentwig-Gesemann, I. & Nohl, A. (edit.):

Die dokumentarische Methode und ihre Forschungspraxis. Grundlagen qualitativer Forschung. Opladen, pp. 275 – 300.

Panofsky, E. (1975): *Ikonographie und Ikonologie. Eine Einführung in die Kunst der Renaissance*. En: Sinn und Deutung in der bildenden Kunst (S. 36-67). Colonia: Dumont.

Schäffer, B. (2003). *Generationen — Medien — Bildung*. VS Verlag für Sozialwissenschaften, Wiesbaden https://doi.org/10.1007/978-3-322-94996-7_1

Schäffer, B. (2005). Computer Literacy und intergenerationelle Lern- und Bildungsprozesse. Empirische Befunde aus Familie und im öffentlichen Raum. *Literalität, Bildung und Biographie. Perspektiven der erziehungswissenschaftlichen Biographieforschung*, Opladen: Budrich.

Correctiv.org (2018). *Unsere Faktencheck-Bewertungsskala*. <https://correctiv.org/faktencheck/ueber-uns/2018/10/04/unsere-bewertungsskala/> (last accessed 28.02.2022)

Correctiv.org (2023). Kein E-Auto: Hier explodieren Gasflaschen auf einem Lkw nach einem Unfall. <https://correctiv.org/faktencheck/2023/04/21/kein-e-auto-hierexplodieren-gasflaschen-auf-einem-lkw-nach-einem-unfall/> (last accessed 24.04.2023)

Süss, D., Lampert, C., Wijnen, C. (2010). Mediensozialisation: Aufwachsen in mediatisierten Lebenswelten. En: Medienpädagogik. VS Verlag für Sozialwissenschaften. https://doi.org/10.1007/978-3-531-92142-6_2