Research Report

ON THE STATE OF THE ART OF THE SCIENTIFIC LITERATURE ON CRITICAL THINKING AND MEDIA LITERACY IN VET

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Index

Summary

Nowadays, the prospects about critical thinking and media literacy among citizens in European countries appear to be uncertain. A deeply rooted and widespread lack of meta-cognition and media literacy among the European population can be seen as one of the main factors concurring to the rise of phenomena such as anti-vax and nationalist movements. This issue can be felt particularly strongly in individuals coming from the vocational education and training world. Therefore, researchers and practitioners in the field of initial vocational and educational training (iVET) are considering which educational models would be adequate to complete the current educational programs as a way to enhance critical thinking and media literacy. Accordingly, the NERDVET project intends to address this question using multiple research methods merging different disciplines (varying from cognitive psychology to educational science) in order to offer a knowledge-based description of critical thinking and media literacy education for iVET students. It is in this context that the NERDVET project's partnership presents the present research report, which contains the initial research phase of the project: a broad and systematic literature review of the state of the art of the scientific literature on critical thinking and media literacy in the iVET field.

The first task envisaged by the project (i.e., the systematic scoping review) consisted in a systematic review of the relevant literature on the following aspects:

1- The key critical thinking skills influencing the judgment decision-making process of iVET students

2- The best practices and interventions conducted at International, European, national, and regional levels.

The systemic scoping review method allows researchers and practitioners to form an initial idea about the aspects and core characteristics of a specific phenomenon by considering the extent of the literature on the topic under investigation. Then, the theoretical model of the intervention and educational model can be hypothesized considering the relationships between teachers practice and students' critical thinking skills and media literacy. Such model will provide the basis for the development of a new intervention to be designed and tested in the following tasks of the project.

Indeed, in the intervention phase, building on evidence from scientific literature, the project partnership aims at designing and testing an overarching intervention model to support and enhance teachers' practices for students' critical thinking skills based on educational and training approaches and a psychology-based approach to develop training packages (an Educational Toolkit, a Distance Training program and a training intervention for teachers' best practices). The first training package will deal with the improvement of an educational toolkit for the best didactical practices influencing critical thinking skills (i.e., educational toolkit for best didactical practices for IVET and technical students).

Therefore, a systematic-scoping review has been conducted, by which N = 19 contributions have been collected and reviewed, as this report testifies. The analysis of these contributions reveals some important aspects about how to define critical thinking and media literacy and what are the practical and research implications in terms of possible training interventions for enhancing iVET

students critical thinking and media literacy skills. In the following sections of the first NERDVET report will be described (a) the rationale of research and the reasons for conducting a systematic scoping review of the state of the art (introduction); (b) the methodology used, and the data collection procedure matching with the results of the research conducted (literature review section); (c) the discussion of the results and the implications for research and practice (discussion section). This review proposes to define critical thinking and media literacy as two connected meta-cognitive abilities that support the comprehension and evaluation of new information, especially in the social media context. . Moreover, findings on the training strategies suggest that three main aspects are crucial for the enhancement of critical thinking and media literacy in students:

a. the role of the teacher
b. the use of examples to highlight what critical thinking and media literacy are
c. the use of stimuli for supporting students' application of critical reflection on media information.

Despite covering a very sectoral topic, this review responds to the imperative for addressing critical thinking and media literacy in the VET and opening the way for embedding them in this field's curricula. Keywords: Critical thinking and Media Literacy; Vocational education and training; iVET; Systematic scoping review.

Highlights

Research questions: What are critical thinking and media literacy? How to enhance critical thinking and media literacy in the context of IVET?

Purpose: The present report intends to focus on the need for knowledge concerning critical thinking and media literacy in the context of IVET. A review of the scientific literature is presented.
Method: Systematic-scoping review.

Results:

Definitions of critical thinking and media literacy. Critical thinking can be understood as a central element both for the single individual and for the social implications that it can have, being a metacognitive competence regarding the ability to reflect, analyze and question information, resulting in proactive behaviours and citizenship. Media literacy is defined here as the correspondent of literacy for media information, where the alphabet and language used are the contents of the media. Media literacy encompasses the knowledge and skills to think critically about media information through an understanding of media representations, structures and implications. *Teaching and training strategies*. Studies of training and teaching practices suggest a wide range of relevant factors at student, teacher, classroom and community levels that can enhance critical thinking and media literacy. These include teaching practices that facilitate autonomy of thought through the stimulation of reflection to provide students with sufficient and appropriate resources for maintaining critical thinking and media literacy as habits outside the school context. The identified strategies aim to improve individual disposition and personal resources, as well as to reduce cases of cognitive errors and prejudices. The most important aspects for the elaboration of a training intervention in critical thinking and media literacy concern (a) the role of teachers in creating the conditions for the enhancement of critical thinking and

media literacy; (b) the use of noteworthy examples to explain the implications of a higher level of critical thinking and media literacy, as well as the context in which such metacognitive aspects may occur; (c) the use of stimuli to support the application of critical reflection of media information leading to advance the possibilities that students keep a critical attitude through self-developed personal stimuli.

1. Introduction

In the context of social movements and phenomena such as anti-vax contestations, nationalist movements, and similar, policymakers and academics have widely paid attention to the related issues of civic education, critical thinking and media literacy (Martens & Hobbs, 2013). In this context, the current transformation of the information environment with the birth of new information models and storytelling styles imposed by web and social media has been identified as one of the main causes of such social challenges reverberating the urgency of supporting individuals' competencies to understand media contents and critically reflect on social and media stimuli (Pfaff-Rüdiger & Riesmeyer, 2016). For example, the social implications of fake news and post-truth phenomena have been considered as the new means of individuals account-making for their civic participation. The anti-vax ideology as well as the birth of nationalist and extremist groups are generally viewed as the consequence of the widespread and profound presence of media illiterates and the avoidance of the application of critical thinking (Bayer et al., 2019).

These phenomena highlight the need to improve the general level of critical thinking and media literacy skills also among those groups which are not involved in humanistic education. The level, quantity, and quality of the education received impacts profoundly the development of meta-cognitive abilities (in this case, media literacy and critical thinking). Critical thinking dispositions and media literacy, which are habits of mind and attitudes that influence positively or negatively the propensity of a person to think critically, have received particular attention in the vocational education and training field, leading researchers and practitioners to promote interventions at the educational level (Bayer et al., 2019; Martens & Hobbs, 2013; Rauner, F., & Maclean, 2008). Within the current literature addressing critical thinking and media literacy as one of the key-competences of citizens in western countries, it is largely highlighted how individuals who received technical knowledge are more prone to incur in flawed choices supporting the call for studying these individuals when addressing social issues. This is the case of initial vocational education and training (iVET) students since, if compared with students attending other education pathways (high secondary schools –such as lyceums-, or secondary technical schools), the push for acquisition of technical knowledge can affect the development abilities for the comprehension of media information and critical thought (Banerjee et al., 2015; Barabasch & Keller, 2020; Geers et al., 2020; Lindell & Hovden, 2018).

Vocational education and training (VET) pathways place more emphasis on the acquisition of technical competencies (i.e., about an average of 70% of teaching and training hours is dedicated to technical subjects; OECD, 2010) rather than literacy or transversal skills. Moreover, a considerable percentage of iVET students are often young people with previous school failures, learning difficulties and/or disadvantaged social and familiar backgrounds, which are all elements that negatively affect their access and opportunity to develop and apply critical thinking in a comprehensive way (Noorani et al., 2019). This condition is consequently capable to negatively affect their media literacy as well, which often brings to relational problems in the classroom, that teachers need to manage without being fully prepared for that. Although the scientific literature has witnessed a heightened interest and knowledge on the need of educational programs capable to support iVET teachers and trainers in critical thinking and media literacy provision, there is still a lack of comprehension about which educational strategy for iVET students aimed at enhancing their critical thinking and media literacy

might be implemented and at correcting current educational pathways in the view of possible social changes (OECD, 2010; Noorani et al., 2019).

The present paper aims to address the need for enhancing critical thinking and media literacy skills among VET students by conducting a review of the existing scientific literature. As such, a literature review is intended to offer a synthesis of the literature according to a systematic and rigorous methodology in response to the core questions linked to critical thinking, media literacy and teaching methodologies in the VET field. Therefore, the present work will address the following main research questions by considering the current scientific literature:

- What do critical thinking and media literacy mean, In particular in iVET systems?
- How to enhance critical thinking and media literacy in iVET students?
- What are the best training and teaching strategies and practices in the iVET field?
- How to help students develop their critical thinking and media literacy?

By addressing these research questions with a literature review, the present article will propose a framework to support possible educational models to be included in the existing iVET pathways to foster critical thinking and media literacy. This paper is divided into three main sections, the first of which will introduce the method of the systematic review and scoping syntheses as a possible vehicle to reach the project's goals goals in the context of education and training. The second section will present the results of the literature review by providing an overview of the current trends on critical thinking and media literacy in VET schools. These results will be seen more in depth in the third section, the discussion. In this part, further perspectives and possible practical implications of this analysis are presented.

2. Literature Review

2.1 Method

A systematic review is a research method is a way to identify, assess and analyse original contributions in scientific/not-scientific literature in order to (a) investigate a research question, (b) find gaps in up-to-date knowledge and/or (c) specific guidelines for further research and practice. The current scientific literature foresees a few different ways to conduct a literature review. The most used is the so-called PRISMA procedure which offers a very strict process for data selection and analysis. Such a method is common in disciplines such as medicine, pharmacology, or general psychology, where the researchers aim at identifying a solid knowledge for strict theories. However, within the field of education and teaching strategies strict criteria and rigid analysis might reduce the number of potential sources and, consequently, affect the theoretical comprehension of a specific phenomenon. Accordingly, this paper refers to the methodology proposed by Briner & Denyer (2012) to carry out systematic reviews in organisational contexts, human resources management, vocational education and training and lifelong training (Tommasi et al., 2020a). Briner & Denyer (2012) argue that a systematic review can be a theoretical, methodological, and prospective contribution to future research and application of interventions. Therefore, despite the term systematic, in the context of education and training, research syntheses and reviews should be guided by methodological principles and not by restricted procedures. These principles are: organisation, transparency, replicability, quality, honesty, and relevance. These methodological principles allow authors to write systematic reviews that inform both the scientific community and practitioners, offering keys to understanding the phenomenon in analysis, resulting from processes of analysis and synthesis of the collected contributions. However, since these are methodological principles, the authors suggest proceeding according to the following research phases in order to maintain a degree of consistency in structuring the review: (a) plan and definition of the research objectives on the basis of the research questions; (b) structured research and inclusion criteria based on the research devices; (c) evaluation of the results on the basis of the research criteria; (d) extraction of the evidence from the contributions identified through the provision of an analysis tool and (e) analysis and development of a synthesis for the dissemination of the results according to the research intentions.

Moreover, the synthesis and dissemination phase of the collected contributions can take place in different ways as long as they are relevant for the authors' purpose (Campbell et al., 2003, p. 672, cited in Briner & Denyer, 2012, p. 123). In these terms, there are different types of synthesis modes. However, a common classification within qualitative and quantitative studies in the organisational and educational field suggests four different methodological classes: aggregative, integrative, interpretative, and explanatory syntheses (Rousseau et al. 2008). The present collection is characterised by a wide-ranging focus on the available literature. This leads to a heterogeneoud bibliographic database in which, according to the case, sometimes qualitative rather than quantitative or theoretical contributions are presented. Rousseau et al. (2008) identify the integrative type of synthesis as the most suitable approach to combine different methodologies and contributions, contrasting this type of synthesis with the deductive (quantitative-based) and abductive ones (this second type is also mixed-based, to add further information to the research evidence). In the case of this paper, the process of interpretive synthesis followed the guidelines for writing a scoping-synthesis (Arksey & O'Malley, 2005). A review aims to examine and dissect the collected contributions to define

the issues at stake and explore the relationships between them. In these terms, the scoping-synthesis method is of considerable help in developing a cognitive contribution to the object under review by facilitating the process of interpreting and integrating bibliographic data. This methodology is based on the mapping of the key concepts underlying the investigated area of research, regardless of the type of contribution in which they are included, thus favouring a diversified reading by expanding the eligibility criteria for inclusion in the collection and synthesis process of the available sources (Arksey & O'Malley, 2005).

2.1.1 Data Collection

Based on the proposed methodological principles, the data collection procedure was arranged in five phases (see Figure 1). In the first phase, the keywords referring to the research questions were defined, namely, “critical thinking” “Media Literacy” “Decision-making process” “Vocational Educational Training” “training” “teaching”. These were then tested in three international bibliographic search databases (Scopus, Web of Science, and Eric). The test for the correctness of the keywords was confirmed by the results obtained (N= 45.165, n = 378 on Scopus, n = 6925 on Eric, n = 37862 on Web of Science). To better focus the search, in the second phase, more structured extraction strings were used, i.e., a set of the keywords and linked synonyms as a means for the detection of bibliographic material. Here, to the initial keywords were added the following terms and phrases: “VET” “Initial vocational education and training” “iVET” “train*” “training practices” “training strategies” “education and training” “educational toolkit” “educational programs” “educational models” “edu*” “critical reflection” “media comprehension” “media illiterates” “decision-making competence” “optimal decision-making” “informational processing”. All the terms were considered via the command “AND” “AND NOT” “OR”. These commands allow users to guide the search by creating specific categories of analysis and data extraction. For example, as for the research domain, all the terms related to the initial vocational education and training sector were added using the “OR” command including all the terms that can be related as “VET” “iVET”. While with the command “AND NOT” it is possible to exclude domains that are not relevant with the research sector such as “veterinary” which frequently used via the acronym of VET. As for the command “AND”, the category of the research domain of iVET is coupled with the category of “Critical thinking” AND “Media literacy” as well as the category of “training practices” etc.

Moreover, specific criteria were added for inclusion of the contribution such as the temporal range, language (English), type of publication (i.e., peer-reviewed articles), and field of research (decision sciences; psychology; education; social sciences; arts and humanities). With respect to the temporal range, since the concept of critical thinking has a long history in the education and training fields as well as in psychology, while media literacy is more recent, a specific period of research was selected, based on the first conceptualization of critical thinking by Scriven & Paul, presented at the 8th Annual International Conference on Critical Thinking and Education Reform, 1987. In this phase, n = 375 articles were collected: they were firstly scrutinized based on the presence of duplications resulting in a total of n = 372 articles. These results were evaluated in the third phase according to the (a) research field by considering the contributions’ sources, (b) title and (c) abstract, in order to discard possible contributions out of the education and training domains for a total amount of n = 75 included for the for the fourth phase of the data analysis (n = 3 articles were included based on the knowledge of the authors).

2.1.2 Data Analysis

During the fourth phase, the researchers involved (n = 4) worked individually, proceeding with an evaluation of the contributions collected according to the criteria of the relevance of the contribution and the research questions. After a comparison of the evaluations, researchers compared their assessments to find a convergent number of contributions that could be included in the study. Then, six groups from the NERDVET project partnership analysed separate contributions using an evaluation form, proposing a summary for each work extracted. The use of the evaluation form started the process of describing the contents based on the work extracted. The evaluation form comprehended both the evaluation of selection-risk bias, the quality of the article, its characteristics (e.g., qualitative study, quantitative study, theoretical article etc.), and a brief presentation of the contents. Each contribution had to be rated at low, unclear, or high risk of bias, on the following seven domains: random sequence generation (selection bias), allocation concealment (selection bias), blinding of participants and personnel (performance bias), blinding of outcome assessment (detection bias), incomplete outcome data (attrition bias), selective reporting (reporting bias), and other biases. The six groups of researchers and practitioners delivered their evaluation forms to the four researchers involved in the present task, who then re-evaluated each contribution and reached the final number of n = 19 contributions that were included for the synthesis phase (see Figure 1).

2.2 Results

2.2.1 Overview of the Contributions

As a first step, the researchers involved produced an overview of the contributions included based on specific categories of analysis (see Table 1). Contributions were grouped by type (e.g., scientific articles vs books / manuals); research methodology and approach; reference population, if present, both in the case of nationality and school program to which they were addressed (e.g., iVET). With regards to the type of article, the following distinctions have been made: synthesis and / or theoretical contributions based on literature reviews (n = 3); qualitative / quantitative empirical contributions (n = 13); conceptual article (n = 3). Among the articles, the school program of reference generally concerns all sectors that rely on the iVET domain. In particular, the authors refer to training and education in the technical field and to specialized training. Finally, the contexts in which these studies take place are various, but mainly concern the Eurasian area countries and the United States.

2.2.2 Definition of critical thinking and media literacy

Given the disparate range of contributions, it is unsurprising that a similarly extensive range of theoretical frameworks and definitions of critical thinking and media literacy had been used. In many of the studies, however, it was difficult to discern a specific theory that was relied upon to explain the two dimensions themselves. In such cases, where possible, the intention of the authors was inferred by carefully reading each article. Therefore, to enhance the comprehension of these aspects, an analysis of the theoretical background was proposed to understand the dimensions of critical thinking and media literacy.

Theoretical background

The analysis of the contributions revealed that authors used different methodologies as well as different theoretical frameworks to address the dimensions of critical thinking and media literacy. To understand how media literacy and critical thinking are taken into account, it was considered how authors presented them evaluating the underpinning theoretical model. It was found that authors differed in their contributions according to their intentions in the study of initial vocational education and training students. A large group of authors referred to educational and pedagogical models while a second small group used as a theoretical reference the scientific knowledge from the fields of general psychology, cognitive psychology, and social psychology. Moreover, within each group there were other differences among the contributions.

Firstly, the pedagogical and educational science-oriented group comprehended four main categories of theories. In one case, authors referred to Bernstein's model (2003) of education to evaluate educational practices in the pursuit of enhancing critical thinking and media literacy (Rönnlund et al., 2019). Similarly, other authors proposed to consider critical thinking and media literacy by advancing the knowledge on social and political activism (Geers et al., 2020). In this case, the authors suggested that educational models with additional programs in iVET are integrated to help teachers to stimulate civic competence and political knowledge via an in-person simulation. Moreover, others referred to the branch of transformative pedagogy practices by which the trainers and teachers can help to liberate individual thinking and facilitate a process of unlearning previous beliefs and ideologies (Ngidi & Dlamini, 2017). In the fourth group of authors, they used a general educational science model about media literacy and critical thinking. Here, the authors focus on the transition and transformation of multimedia platforms required education in media literacy (Valtonen et al., 2019), as means to foster iVET students' level of awareness and decision-making process (De Abreu, 2010; Bergstrom et al., 2018). In this category, authors from other branches such as special education are grouped. In this case, the study about curation in digital and media environment is seen as capable of fostering critical thinking and media literacy via the curation ability, i.e., the ability to collect, select and filter information (Mihailidis & Cohen, 2013). Here, some authors suggested the study of practice and teaching strategies that advertising uses to influence young people (Stanley, 2020). Finally, in the same group, authors who supported a political view of education and suggesting a policy-making orientation are reported. Accordingly, these authors suggested that from the point of view of general education, policy makers should invest on educational programs with the aim to foster individual citizenship and decision-making competence for social impact (Nylund et all., 2017).

In the psychology-oriented group, there were also internal differences among the authors. As previously noted, the psychology-oriented group covers all the contributions that relate to cognitive, social and general psychology. Some authors referred to the proposed model of social interactions as a means for learning by Bandura (1986). Here, the authors (Banerjee et al., 2015) used such a social cognitive theory to support the idea that critical thinking and media literacy can be seen as a learning process resulting by viewing and interacting with others in the classroom.

By proposing a broad social view of the importance of critical thinking and media literacy, other authors used the model of human capital theory to justify the need to implement educational models on critical thinking and media literacy in the context of iVET (Abusomwan & Edokpolor, 2019; Schultz

1961). Similarly, others suggested models from political theorists who foresaw the need to foster critical thinking in citizens by Bloom and Watson-Glaser (2002) (Loseby, 2019). Finally, via a cognitive approach, other authors used the cognitive psychology models of debiasing as a means for intervening on critical thinking and media literacy in the context of iVET and citizenship behavior (Kenyon, 2014).

Definitions of Critical Thinking & Media Literacy

Critical Thinking. Among the authors there is a large consensus over the importance of critical thinking and media literacy, although some authors have focused on different aspects of the two dimensions.

As for media literacy (see next section), critical thinking represents one of the key issues in today's media environment, whose study in the context of vocational education and training is meant to foster students' active citizenship behaviour, autonomy, self- and social- responsibility as well as self- actualization. Accordingly, there is a high agreement among the authors about the importance of critical thinking in VET students, although authors provide different and separate definitions of it. That is, a large group of authors considered critical thinking as the ability to reflect, analyse and question, and to see things from different perspectives (Rönnlund et al., 2019) while others proposed to consider critical thinking as the ability (a) to apply scientific rationality to analyse the data from the past, (b) to recover inner and personal dispositions to not be influenced by the media environment and, thus, actively construct personal ideas, their thinking and actions (Vernier et all., 2018). Another group of authors consider critical thinking as the most important ability for initial technical VET students for entrepreneurship (Abusomwan & Edokpolor 2019), while others view critical thinking as important for a positive learning experience and the development of essential skills in the contemporary work environment (Barabasch & Keller, 2020). In other cases, authors consider critical thinking in relation to media literacy in view of the importance of questioning personal beliefs and social orientation (Ngidi & Dlamini, 2017), which is linked to others who consider critical thinking by focusing on reflective thinking, decision-making and epistemological commitment on what to believe (Valtonen et all., 2019). In this case, critical thinking is connected to a more effective decision-making process allowing to analyse a situation from more perspectives to have a 360-degree vision (Loseby, 2019). Accordingly, critical thinking is viewed at the same level of optimal decision-making competence, which relates to the ability to avoid cognitive errors and the use of heuristics (Kenyon, 2014). It is in this context that authors considered critical thinking in relation to artificial intelligence and proposed programs such as the HEP to foster individuals' self-criticism and critical thinking to implement VET educational programs (Nylund et all., 2017). Moreover, in this context, critical thinking is viewed as an antecedent of positive social skills to critical thinking with issues such as body image, racial stereotypes, and gender (Bergstrom et al., 2018).

Media literacy. As seen, among the authors there is a relatively high agreement on the importance of media literacy for todays' students in vocational education and training programs. Despite the different theoretical backgrounds, types of education and personal conditions (e.g., age, gender...), media literacy is seen as a core characteristic for active and conscious citizenship, as well as an indispensable aspect for dealing with the huge amount of information everyone is exposed to, in its different shapes. Despite the agreement on its importance, authors reported different definitions and attributes of what media literacy means. A large group of authors presented media literacy as the

ability to critically access, analyse, evaluate, and create media messages (Shilder et all., 2019; Banerjee et al., 2015). Accordingly, media literacy corresponds to general literacy, in that it is meant to cover all the knowledge and abilities linked to the information and decision process in media context. Other authors presented media literacy similarly although without a clear identification of its aspects but rather an idea of its context and implications. They considered media literacy as the cognitive awareness of the importance of media messages and its impact on the public. Such an awareness is meant to foster individuals' responsibility to critically evaluate media messages (Geers et al., 2020). Moreover, other authors have proposed to consider media literacy as a useful ability for students since it enables to recognize the differences between fake and real information via the de-construction of language, ideas, and media to raise the ability to make decisions linked to media stimuli (De Abreu, 2010). Finally, a last small group of authors considered media literacy as the ability to reach and understand information within the media context, although these authors did not provide a clear idea about how such a process is sustained (Mihailidis & Cohen, 2013). In particular, this group supports the idea that through the creation of stories and narratives individuals can make sense of the contents they confront and improve their ability to make decisions.

2.2.3 Interventions for Critical Thinking & Media Literacy and Training practices

Within the number of contributions collected by the systematic scoping review, some contributions directly tested training interventions. As a result of the different theoretical orientations and conceptualizations, it appears clear that training interventions for critical thinking and media literacy in iVET differ. Such differences have been considered by referring to two main criteria, namely: the focus on the training aspect (i.e., on the teacher vs on the student; tech-stimuli vs non-tech-stimuli) and the setting (i.e., in vs outof the classroom). Moreover, all the interventions reflect the differences related to the theoretical background as well as according to the definitions of media literacy and critical thinking. However, such a difference is not as relevant as those related to the focus and the setting since all the interventions share more common aspects whether they are based on different and separate researches or derive from different and separate research fields.

Given that the present report is intended as a means for supporting the creation of educational training programs for enhancing iVET students critical thinking and media literacy, the interventions have been grouped based on the similarities of training methodology. In this way, it has been possible to understand what are the main categories of teaching and training practice that can be considered when proposing a practical educational toolkit for the iVET. The categories are: (a) the use of worthy examples, (b) the use of social message, (c) literary fiction as a teaching tool and (d) stimulating civic engagement.

The use of worthy examples of critical thinking and media literacy

Banerjee et al. (2015) and Bergstrom et al. (2018) proposed similar training interventions where the use of worthy examples of critical thinking and media literacy are seen as a means for their enhancement. In the first case, the participants to the study attended a 75-minute media literacy workshop including discussion of persuasion techniques and advertising claims employed by advertisers, along with coverage of the production features typically used to sell alcohol and other products. As such, participants learned to critically evaluate the claims made in alcohol ads and anti-alcohol and HIV istances. Therefore, critical thinking is addressed by referring to illustrative aspects of

growing and keeping aa critical mindset. By the evaluation of this procedure, the authors identified four factors from the assessment system developed and considered according to the aim of the study, i.e., involvement, personal reflection, perceived novelty, and critical thinking. By the statistical analysis of the positive relationship among the variables, the authors reported that with their intervention the considered dimensions were strongly connected. The correlations between the two subscales measuring the same latent construct – involvement and perceived novelty (r = .48) that measure engagement, and critical thinking and personal reflection (r = .56) that measure reflectiveness – were generally greater than the correlations between pairs of subscales hypothesized to measure different constructs (Banerjee et al., 2015). In the second case (Bergstrom et al., 2018), two groups were created, i.e., experimental vs control. Participants in the experimental (i.e., intervention) group received training in media literacy on the issues of body image and gender and racial media representations. The intervention lasted approximately between 65 and 75 minutes for all the participants in the group which should show a certain level of critical thinking and media literacy because of their awareness of the social representations and their implications in the information and decision-making process. By the evaluation of the study, the results showed the influence that the media has on the perception that young people have on issues related to gender, racial issues as well as on body image. According to the authors, training in media literacy using social representations analysis represents a useful tool to improve general media literacy skills and critical thinking. Moreover, the results of the study highlighted the important benefits that the acquisition of critical competencies and literacy skills had on the participants to the study when compared with the control group that did not receive the training (Bergstrom et al., 2018).

The use of social message for common good

Likewise, the use of social message the use of a worthy message as a stimulus for the application of critical thinking and the correct interpretation of media information. Ngidi & Dlamini (2017) proposed a film-based intervention to foster the awareness of social representations to improve media literacy and critical thinking. According to the authors, films allow individuals to personificate their experiences in people with different sexuality or gender identity, as well as to develop a deeper understanding of their experiences. It also offers different ways of seeing and evaluating one's position concerning gender non-conforming people. It further provides the power to deliver a social message using a visual representation that engages and subverts strict gender constructions through documenting the experiences of queer people. After the intervention with the use of movies, the students' views shifted towards acceptance and empathy for LGTBQI+ people; with shift in the views and attitudes of the participants regarding the topic under investigation. As the case of this study, the films helped in debunking myths about homosexuality (Ngidi & Dlamini, 2017).

Literary fiction as a teaching tool

Moreover, authors used a more traditional humanistic approach towards the use of literary fiction support. With a focus on students, as in the previous studies, Schilder & Redmond (2019) proposed a similar intervention that was longer in terms of supporting the students to develop critical thinking and media literacy. By using a classical experimental research design, the authors devised a study with three phases: a pre-test, a direct intervention, and a post-test. The study was conducted during the school's Library and Technology class which students attend once a week for 35 minutes,

on separate days (Stanley, 2020). Schilder & Redmond (2019) proposed a different intervention where the focus was still on the students but in contrast with the non-tech-stimuli, they used technology-based intervention and two different media literacy courses were given to the students: (a) How emerging technologies are transforming our society and schools and the implications these changes have on teaching and learning; (b) strategies for building critical habits of thought concerning new technologies. After the media literacy courses, students' inquiries were more complex and entailed more attention to key concepts related to production techniques and representations (Schilder & Redmond, 2019).

Stimulating civic engagement

By working in a classroom setting, Geers et all (2020) proposed an intervention based on the idea that political engagement among students can be stimulated through a civic educational intervention in the classrooms of vocational schools to support the emergence of critical thought. The program was specifically designed to stimulate civic competence, internal political efficacy, news media literacy, and political knowledge. However, by the evaluation of the intervention, the study increased political knowledge and civic competence, but not media literacy. The program was only able to mitigate an overall downward trend for the group that was actively involved in creating fake news videos but had no effect on those who only took the media literacy classes or watched only the videos on fake news (Geers et al., 2020). The evaluation of the intervention revealed multiple findings on the effects on students' media literacy. The students were evaluated according to their persuasive intention, sales intention, skepticism, cognitive bias, and critical thinking tactics.

2.2.4 Assessing critical thinking and media literacy in VET

Regarding the assessment of the training intervention for critical thinking and media literacy, as for all the categories, there were differences among the contributions in the way by which authors evaluated the effects of their interventions. Accordingly, as an object of analysis, such differences have been grouped distinguishing between quantitative and mixed methods. As for the quantitative methods, the authors used self-report measures and performance questionnaires on critical thinking and media literacy as means to have a quantitative evaluation of the students' levels of these skills. In this context, Banerjee et all (2015), evaluated the potential abilities and engagement intentions of students using a 5-points Likert scale of agreement comprehending n=41 items. These variables were meant to evaluate the extent to which the intervention was able to foster additional behaviour because of critical thinking (Abusomwan & Edokpolor 2019). Then, they evaluated the intervention using 14 items questionnaire on the degree of engagement with the media contents and information. Despite this evaluation, all the other authors within the quantitative group used direct measure of critical thinking and media literacy such as The Critical Thinking Disposition Scale developed by Akbıyık (2002); The media literacy scale developed by Karataş (2008) (Çelik et al., 2018), or in the study by Rönnlund et all (2019) with ad hoc self-report measures about media competence (Pérez-Rodríguez et al., 2019).

As for mixed methods, authors used interviews and observations such as in the study of Bergstrom et all (2018) which used 30 to 60 minutes semi-structured interviews with apprentices and classroom observations (Barabasch & Keller, 2020). In addition to this, participants completed a pre-test measurement of variables of interest to establish a baseline. About two weeks after a previous

test (pre-test) was completed. Likewise, Ngidi & Dlamini (2017) used a mixed method combining the use of the Reflexivity Measurement Tool (RMT) (Golob et al., 2021) with participatory methods such as role-play, poetry, drawing, focus groups discussions. Schilder & Redmund (2019) used open and structured questions to evaluate students' level of media literacy and their level of complexity drawing on Bloom's Taxonomy. As for the first, the codebook was meant to assess students' level of media literacy by referring to media literacy content. In the second case, the complex content referred to a more abstract aspect as a means for evaluating metacognitive abilities of students.

3. Discussion

This systematic scoping review synthesis aimed to assemble for the first time the knowledge and evidence to date concerning the definition and theorization of critical thinking and media literacy, as well as the linked training and teaching practices in the context of initial vocational education and training (iVET). The emerging picture from this analysis is one of complexity concerning each of these areas in addition to the importance of critical thinking and media literacy and the need for a strategic program to enhance these dimensions in the context of iVET.

How critical thinking and media literacy has been conceptualized within the literature has diverged from Scriven & Paul, presentation at the 8th Annual International Conference on Critical Thinking and Education Reform, in 1987. As many as two broad distinct categories of theoretical background have been identified, suggesting that critical thinking and media literacy are contested terms that, conversely, reflect the same grade of attention given by academics in terms of its relevance.

The analysis of the contributions revealed that the authors used different methodologies as well as different theoretical frameworks. We found that authors differed in their contributions based on their intentions in the study of vocational education and training students. A large group of authors referred to educational and pedagogical models while a second small group used as a theoretical reference the scientific knowledge from the domains of psychology, cognitive psychology, and social psychology. Moreover, within each group, there were still other differences among the contributions grouped. The pedagogical and educational science-oriented group based on the four main groups of theories, the Bernstein (2003)'s model of education (Rönnlund et al., 2019) social and political activism (Geers et al., 2020), transformative pedagogy (Ngidi & Dlamini, 2017) general educational science model about media literacy and critical thinking (Valtonen et al., 2019; De Abreu, 2010; Bergstrom et al., 2018). In the psychology-oriented group, authors referred to the model proposed of social interactions as means for learning proposed by Bandura (1986) (Banerjee et al., 2015), human capital theory (Abusomwan & Edokpolor, 2019; Schultz 1961), model from political theorists who foreseen the need to foster critical thinking in the citizenship of Bloom and Watson-Glaser (2002) (Loseby, 2019) and the cognitive approach (Kenyon, 2014). By implication, the evidence based on the separate and different theoretical background suggesting that critical thinking and media literacy may reflect a deeper and more holistic concept that opens the call for an interdisciplinary and holistic approach for their comprehension and enhancement.

Notwithstanding, the interest in critical thinking and media literacy as an object of interest in the iVET world within the literature offers an initial comprehension of what critical thinking and media literacy could mean. Indeed, despite the theoretical background, definitions proposed by authors

converge into possible comprehensive definitions of the two dimensions that support further roots of research in education. Regarding critical thinking, it has been analysed and studied by several researchers and authors. It is difficult to give a broader definition of critical thinking capable to comprehend and include the multiple aspects identified within the separate strands of research, both in the personal sphere, but also in the social and work sphere.

Critical thinking and media literacy can be defined as two related metacognitive skills. Critical thinking can be understood as a central element both for the single individual and for the social implication that this can have, being a metacognitive competence regarding the ability to reflect, analyse and question information resulting in proactive behaviours and citizenship. As for media literacy, this must be seen as an indispensable element for today's society, given that every day individuals find themselves overwhelmed by thousands of messages, news and information presented in different forms. Some scholars have considered media literacy as a kind of cognitive awareness, which allows people to critically analyze, evaluate and create media messages. Another group of authors, on the other hand, considered media literacy as a skill fundamental for students and young people, linked to the future of democracies. Given the need for a complete definition, media literacy can be defined as the correspondent of literacy for media information, where the alphabet and language used are the contents of the media. Media literacy encompasses the knowledge and skills to think critically about media information through an understanding of media representations, structures and implications.

Thanks to this skill, students can recognize the differences between true and false news, critically analyse the content of the information presented to them every day and make correct decisions in the context of the media. Therefore, according to the literature, critical thinking and media literacy are two close concepts that can be both easily applicable in different contexts and useful for pointing us in the right direction, both in the personal, work, organizational, and social dimensions.

3.1 Implications

3.1.1 Practical implications

Given these initial conclusions, several implications for research and practice can be identified. Indeed, there is some evidence that higher levels of critical thinking and media literacy are associated with positive outcomes for students. Such evidence resounds the merit in considering strategies and approaches that would raise critical thinking and media literacy levels in it. Studies on training and teaching practices suggest a broad range of relevant factors at the student, teacher, classroom, and community levels that may affect critical thinking and media literacy. These include teaching practices that allow for autonomy and stimuli in reflection, and that ensure students have sufficient and appropriate resources, alongside positive, effective teaching styles by iVET trainers and teachers. Since we identified a range of positive strategies that are associated with critical thinking and media literacy, teachers might also want to consider training strategies aimed at enhancing individual disposition and personal resources alongside reducing instances of cognitive errors and prejudice. These include the use of worth and social examples as well as the reference to literary fiction as teaching tools. What is apparent in the interventions analysed is that current research on critical thinking and media literacy in the iVET domain base on the use of stimuli and the so-called nudging process by which students are nudged with worthy and valuable stimuli to apply critical reflection on media information.

In these terms, training must be focused primarily on the person (i.e., the student) concerning the context in which critical thinking and media literacy is employed. In addition, the underlying feature of the transmission and training process is the presence of digital in terms of content and form, providing spaces for digital learning and organization of virtual environments where teaching and transmission processes take place. According to the theoretical proposal, the offer of training in digital format supports the coexistence of critical thinking and media literacy focusing the training modules on the different categories of knowledge and skills relevant to the context. Based on the research conducted, the main characteristics of the training spaces concern (a) the ability to understand and use the online material, and (b) the ability to interact with other learners and trainers through discussion. In this, a fundamental role is played by tutors and teachers to ensure the delivery of content through the processes of facilitation, education, and moderation. However, it is not taken for granted that trainers and teachers are aware of the processes in place and of the usefulness of the use of such strategies is proposing training courses implying a further need to consider educational modules for competent professionals in enhancing critical thinking.

The studies concerning the training communities and the subject in the training of the technological and digital order have amply discussed how processes of subjectification and structuring of the identity of learners take place through critical thinking and media literacy training. In the wake of the current worldwide changes in terms of media and massive information, the citizen of the third millennium will be called upon to structure their identity within the social media and information environment. As such, this case resounds the need for training interventions devised to promote and facilitate the processes of subjectification (i.e., meaning-making process about their roles and work tasks, Tommasi, et al., 2020b) of students in the various way by which critical thinking and media literacy are crucial even about their professional category and social involvement as citizens. These aspects may require a strong mental commitment and are of particular importance for the application of critical reflection on media information. Accordingly, the role of training is therefore to facilitate the processes of subjectification of personal ability to support and develop critical thinking by embedding self-nudging abilities which is even more crucial concerning the context in analysis, i.e., the citizenship behaviour.

It is not surprising that this review highlights conditions and training strategies that can be viewed as in line with the current advance of research concerning cognitive and meta-cognitive abilities. Indeed, this review showed how the most important aspects for devising a critical thinking and media literacy training intervention regard (a) the role of the teachers in creating the conditions for the enhancement of critical thinking and media literacy; (b) the use of significative examples to explain the implications of a higher level of critical thinking and media literacy as well as the context in which such meta-cognitive aspects can occur; (c) using stimuli for supporting the application of critical reflection of media information leading to advance the possibilities that students can continue to be critical by self-developing personal stimuli. As for the role of the teacher, it is clear that in the arena of knowledge sources in our society individuals need the effort and engagement of teachers and trainers to shape the knowledge gained. Conversely, the use of examples means to identify worthy and socially recognized cases that concretely show students how and to what extent the lack of critical thinking and media literacy can impair their decision-making process and lead to flawed choices or stereotyped social representations. The use of examples is not new in the field of training for critical thinking. Indeed, one of the most successful programs for eradicating cognitive errors over judgment and

decision-making process is based on the enhancement of critical thinking exploiting the consciousness gained over automatic processes that help the individual to suppress the automatic response that comes without deliberative thinking. This training helps the development of cognitive reframing for considering other perspectives of the situation, to learn new coping strategies over the heuristic response. Such training belongs to a new improvement research program (i.e., Debiasing) which aims to reduce heuristics and cognitive biases in judgment and decision-making (Croskerry, Singhal, & Mamede, 2013).

Moreover, the use of stimuli for supporting the application of critical thinking and media literacy means that individuals can be concretely helped by shaping their learning environment with cognitive cues that foster meta-cognitive abilities. From a behavioral economic literature point of view, such strategies remind to the so-called self-nudging strategies, which are based on the idea that individuals can define a specific set of personal stimuli, i.e., nudges, that support the application of critical reflection. In substance, this review highlights that if individuals, i.e., students, can understand connections between concepts, break down information and rebuild it with logical connections, then their load of knowledge and understanding will increase. Just teaching students facts about critical thinking and media literacy, including the use of cognitive stimuli, can be an effective way of enabling students to reduce and identify the distortions of cognitive biases in their thinking.

3.1.2 Research implications

In respect of the research implication, despite the growing volume of research on critical thinking and media literacy, this systematic scoping review of the literature in the iVET field has highlighted several important gaps in knowledge. Only 19 studies met the quality threshold, suggesting that a great deal of what has been written about critical thinking and media literacy could be described as incomplete or under-theorized, leaving considerable space for further development of the subject. First, a significant gap remains in the theoretical background and the definition and measurement of critical thinking and media literacy. In particular, the validity of the measurement tools can be questioned in the view of the discriminant validity of the critical thinking and media literacy measures. Further studies in the domain of quantitative exploration of critical thinking and media literacy should compare the relative significance of these dimensions and seek to develop and validate new measures of engagement.

Moreover, there is a need for further longitudinal research that evaluates the comparative salience of a range of different causes of critical thinking and media literacy as well as in reference to the training and teaching practices capable to enhance these dimensions in iVET students. As far as this research went, studies have focused on a relatively limited range of antecedents and training practices, and so there is a shortage of research that compares the potential importance of a range of antecedents for the critical thinking and media literacy levels of iVET students. This would enable researchers to develop more nuanced recommendations for practitioners, based on a greater understanding of the relative importance of the wide range of factors identified to date as being associated with critical thinking and media literacy. Given the call for interest in critical thinking and media literacy among iVET students, further studies would serve to develop the field. Moreover, studies that apply and contextualize the more generic frameworks around students critical thinking and media literacy to organizational settings, including more multi-method, i.e., qualitative or

ethnographic research, that enables deep insights to be generated into the contextual aspects would be welcome. Indeed, among the studies analysed, there has been less interest in the setting within which the studies take place, also in the view of the socio-cultural level. However, it might be possible that there are significant differences between iVET programs (i.e., educational sectors), or cultural settings that are relevant to understanding critical thinking and media literacy.

4. Conclusions

In this research it has been conducted a systematic scoping review of the literature, which, however, as all the studies, sees several potentially limiting factors to be acknowledged. First, the search has been restricted to items published in English. Second, owing to the volume of material returned, it was mandatory to restrict the search terms: therefore, it isn't sure that all studies in areas related to critical thinking and media literacy has been properly considered. Third, in this synthesis weren't considered any contributions that did not meet the internal quality thresholds in terms of validity and reliability. These decisions were taken based on quality but have necessarily limited the scope of the evidence we considered. Notwithstanding, seen the scarcity of previous analysis specifically relating to critical thinking and media literacy, the goal was to synthesize the existing knowledge and empirical evidence base focused on these topics in iVET. The contribution to this goal has been given by assembling, analysing, and evaluating the scientific literature on critical thinking and media literacy in iVET and, secondarily, by highlighting critical gaps and shortcomings in the evidence base, as well as by uncovering the areas where further research and practice would help to develop the active citizenship skills of iVET students. In particular, one of the most important implications of this review is to consider critical thinking and media literacy training intervention by viewing the potential of using three main elements, namely, (a) the role of the teachers in creating the conditions for the enhancement of critical thinking and media literacy; (b) using examples to explain the implications of a higher level of critical thinking and media literacy as well as the context in which such meta-cognitive aspects can occur; (c) using stimuli for supporting the application of critical reflection of media information leading to advance the possibilities that students can continue to be critical by self-developing personal stimuli.

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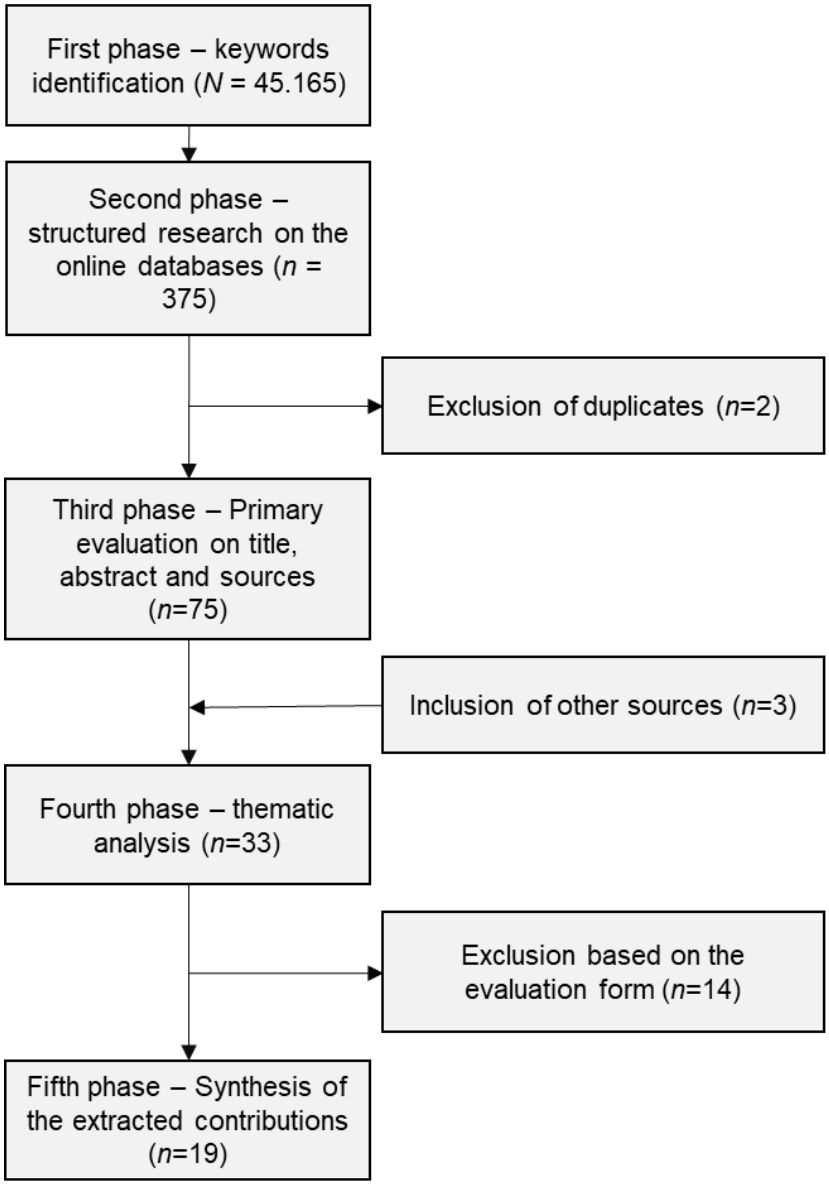
Appendix

Figures

Figure 1, data collection and extraction according to Briner & Denyer (2012).



Tables

Table 1, Contributions extracted from the systematic-scoping review.

N	References	Country	Source	Background	Definitions of Critical Thinking and Media Literacy	Main Implications
1	Banerjee et al., 2015	United States	Research Article	Social cognitive theory	Media literacy is defined as the ability to access, analyse, evaluate and create messages in a wide variety of media modes and formats while recognizing the role and influence of media in society (Aufderheide & Firestone, 1993; Hobbs, 1998). Critical thinking as the degree to which the media literacy activity stimulated critical evaluations of media messages which is part of reflectiveness in combination with personal reflection (the degree to which the knowledge acquired was used to re-evaluate personal conduct).	An initial system for evaluating the audiences' degree of engagement with media literacy interventions and personal reflection on the experience (which is necessary for self-regulation), that can be easily adapted to the particular context of the intervention, and be used for formative, process, and outcomes evaluation.
2	Barabasch & Keller, 2020	Switzerland	Research Article	-	Critical thinking as a core meta-cognitive competence for positive learning experience that contributes to the development of essential skills in the modern work environment.	Taking initiative, acting autonomously, communicating challenges, and seeking advice, self-management, ability to work in different teams as core for critical thinking development learning processes
3	Bergstrom et al., 2018	United States	Research Article	Terminological analysis from an educational point of view	In current times of technological developments, media literacy represents one of the key competencies for students' development of literacy as a means for dealing with multiple information in multiple formats.	Information guidance for developing educational tools at the primary school level.
4	Çelik et al., 2018	Turkey	Literature review	Literature review method	Critical thinking is considered to have a positive effect on education and media literacy. Overall, critical thinking,	Need to develop training programs sequenced by levels from lower to higher specialization in

					can be seen as the basic requirement for the development of some other skills such as critical spirit, reasoning and problem solving. Additionally, critical thinking is considered a basic skill. This skill becomes more important for primary and secondary teachers, since they are in charge of training	media literacy and critical thinking specifically directed at teachers. In this way, upskilling processes can be activated that allow teachers to improve their skills and abilities in these fields.
5	Cohen & Mihailidis, 2013	United States	Literature Review	Literature review method	Curation as a core media literacy competence for the digital generation. Students, as curators themselves, can struggle with assessing content, perspective, platforms, agendas, and frames as they sift, sort, and organize information from the depths of the Internet.	Through student-driven, creation-driven, collective and integrated teaching approaches to curation, the framework aims to build towards savvy media consumption and production, critical evaluation and analysis, and participation in local, national and global dialog.
6	De Abreu, 2010	Finland	Literature review	Literature review method	Media literacy education is the only way in which schools can provide a working knowledge of the construction of language, ideas, and media. Media literacy education is the direct opposite of censorship. It is empowerment of the best kind by teaching students to thoughtfully question and consider the choices they make as they participate in various media.	Supporting teachers critical thinking and media literacy to support the enhancement of critical thinking and media literacy in students.
7	Edokpolor & Abusomwan 2019	Nigeria	Research Article	Human capital theory	Critical thinking and problem solving is pointed as one of the specific abilities required by TVET students to start-up a business after graduation.	Importance of TVET student's potential abilities and their intentions to engage in sel-employment upon graduation.
8	Geers et al., 2020	Netherland	Research Article	Political involvement through a civic	Media literacy might make the students more aware of the importance of media messages in public life and	The study increased political knowledge and civic competence, but not media literacy.

				educational intervention.	enables them to both critically evaluate and create messages.	
9	Golob et al., 2021	Slovenia	Research Article	Reflexivity theory (Archer, 2016)	Critical Thinking and Media literacy as individual potentials to actively engage with the environment	Younger generations are more meta-reflexive, as are women and those with tertiary education. Persons with tertiary education are more likely to be meta-reflexive, and persons with higher meta-reflexivity are more likely to check media information frequently.
10	Kenyon, 2014	-	Conceptual Article	Cognitive psychology models of debiasing.	Critical thinking is intended to foster practical reasoning skills of mitigating or forestalling the effects of biases – to enable students to identify biases in reasoning, and to minimize biases in their own thinking.	Intuitive approach to explain critical thinking including the question of the debiasing. Critical thinking education should include extensive practical guidance on how to structure and engage with one's environment to promote good reasoning.
11	Loseby, 2019	-	Conceptual Article	Bloom and Watson-Glaser models	Critical Thinking will lead to a more effective decision-making process, which can be highlighted as well as the creation of new ways to work and will allow us to analyse the situation from more perspectives so as to have a 360-degree vision.	Intuitive approach to explain critical thinking in a work and school environment
12	Ngidi & Dlamini, 2017	South Africa	Research Article	Transformative pedagogy.	Critical thinking as the ability to questioning personal beliefs and social orientation	Students should find ways to ensure that such policies are infused in their daily life and praxis of learning space. Need of political reforms.

13	Nylund et al., 2017	-	Conceptual Article	Educational policies	Educational programs can be developed and provided with a specific focus on skills for critical thinking and media literacy in VET domain. Language and communication are positioned in relation to more general contexts and competencies and are closely related to abstract and critical thinking.	The curriculum analysed in this article is an expression of an international policy trend in which market principles steer vocational education.
14	Pérez-Rodríguez et al., 2019	Spain	Research Article	Digital education	Literacy and critical thinking render students capable not only of accessing information through new technologies but also of selecting, analyzing and evaluating it properly.	Need for an educational program for children and young people in media literacy and critical thinking that helps to alleviate the deficiencies they present.
15	Rönnlund et al., 2019	Sweden	Research Article	Bernstein model	Critical thinking is considered as an ability to reflect, analyse and question, and to see things from different perspectives. As such, it is an important competence for active and democratic participation in society. Critical thinking can help individuals to see and problematise social structures and their own position in these, including questioning social orders and taking action in order to make a change.	Provide students with the opportunity to practice and develop some important skills to participate in civic discussion, including raising critical questions, for example, about power relations and hierarchies. Students must be encouraged to develop qualitative, extensive and empowering civic knowledge.
16	Schilder & Redmond, 2019	United States	Research Article	Media literacy education.	Media literacy: The ability to critically access, analyse, evaluate, and create media message.	Use of codebook for evaluating media literacy of students as a valid assessment of students habits of inquiry and ability to critically analyse, evaluate, and create media messages.
17	Stanley, 2020	United States	Research Article	General education	Media literacy and critical thinking as core for reflection and communication.	Need for longitudinal evidence and importance of considering students age and individual differences when devising training intervention.

18	Valtonen et al., 2019	-	Literature Review	Literature review method	Definitions of critical thinking focus on reflective thinking about decision-making and epistemological commitment on what to believe.	The article provides technical perspectives to the discussion of media literacy education (integrate these perspectives in media literacy curricula in order to provide students with skills needed in today's media environment). Challenges for curriculum design and for teachers and teachers collaboration.
19	Vernier et al., 2018	Cile	Research Article	-	Critical-thinking means being able to apply rationality to analyse the data from the past, and recover subjectivity and value the individuality of each individual to actively construct their thinking and their actions in the present. This is an integrated process in which both dynamics are mutually supported.	The researchers suggest the adoption of instructional design that foments group work for the performing of analysis of media tasks. The platform could gather the opinion of each participant and highlight the differences in points of view.