Opinion of educational stakeholders on critical digital information literacy in Europe

Report for guiding implementation of information literacy

Universidad de Alcalá

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1 Summary and rationale

Critical digital information literacy is a concept of digital information literacy which has recently attracted intense attention from experts and authorities. There is now a clear perception of the threats of information manipulation not only in ideological and political contexts (the so-called fake news) but in social and marketing fields. Given its importance, the implementation of information and data literacy cannot ignore this approach to remain aligned to present needs of educational stakeholders and of Society. This document reports the findings of a specific study on the perception of the three main topics of critical digital information literacy by a wide sample of respondents representing stakeholders involved in education of adults, young and older, including higher education: students, teachers, and managerial staff. The study is based on an online survey responded by 121 persons of the target groups and provides relevant insights on their perception of three main topics of this approach that have been identified as relevant parts of information literacy [1] [2] [3]: security and privacy, critical thinking against digital marketing strategies and digital accessibility. Analysis of results shows a high degree of homogeneity in opinions except in the possible impact of gender in the discipline.

2 Introduction to three relevant topics

Information manipulation, advertising and disinformation are not new: they have been present in different shapes along the human history. With the arrival of consumerism, techniques traditionally applied in politics and ideology have migrated to impact potential consumers of products or services. Digital channels provide powerful communication and social interaction for social collaboration and cooperation for achieving common goals, but they are also threats to informed decisions in habits, consumption and social life. Moreover, they imply a threat to privacy, digital image and reputation or even a risk of fraud and scams [4]. The EU supports the European dimension of fight against information manipulation [5]: the ability to analyse and interpret data is a European digital problem

The situation requires not only general awareness-raising actions are required, but also basic individual training to understand:

- Digital marketing and communication mechanisms to induce decisions or attitudes (clickbait, manipulated information, etc.)
- How frauds, privacy risks, security threats are actively prevented by user-friendly actions
- How data literacy training can help strengthen critical thinking.

Skills such as critical thinking and informed decision-making can mitigate the situation as they promote good data analysis practices, which help to detect information manipulation [6]. These skills are effective for personal life and also highly valued by employers (e.g. [7]). They are key to the effectiveness of technical and conceptual training. However, it is hard to develop such skills without advanced communication mechanism and gamification [8]. Projects on educational innovation, such as the ones from the Erasmus+ program, have addressed the challenge of the fake news. However, after analysing 599 projects linked to critical thinking and other 347 linked to the other topics of digital information literacy, their approaches tend to focus on a general and ideological or political impact rather than in their use in commercial and social context. Therefore, there is a need of educating young and older adults on the manipulation and influence of digital marketing on consumption and on social influence behaviour of youths.

There is another aspect, which also contributes to a proper management of digital information. In general, young people is motivated towards inclusion and social causes. However, in the digital domain they tend to believe that a simple IT user cannot contribute to inclusion with digital accessibility as the WAMDIA project [9] found out: users do not know how to help people with disabilities in the digital divide. Directive 2016/2102 [10] obliges public authorities to offer the digital information in an accessible way, including the mere documents and files. It is not possible to ensure a proper management of digital information if there are groups of population, which cannot use all the contents. So, education in digital information must also address this facet of creating and managing accessible digital information, which avoids barriers for people with disabilities, as a social and solidarity challenge in its vocation and training.

Finally, there is evidence which supports the idea of a gender perspective in the analysis of the situation as young women seems to experience higher level of risk:

- Gender differences are less than 2-3% in use of Internet communication and media but young women use more non-professional social networks (e.g. Facebook and Instagram vs. LinkedIn) and are more exposed to risks. Companies and organisations are increasingly using these channels [11].
- More pressure for positive image on networks with extreme "perfectionism" among young people in the US, Canada and UK, with more depression and anxiety for women. The need for image underlines consumerism in the group. A Norwegian survey with 23,500 participants explored the relationship between social networks, narcissism, and self-esteem and found more addictions in women [12]. Moreover, marketing experts increase the pressure for trust in brands on social media [13]
- More digital safety incidents in young women, who have received less training in internet use [14].

This short review of the most relevant topics referred to the education of young and older adults suggests several topics as useful for enhancing their capacity against the above-mentioned risks: critical thinking regarding digital information, basic data analysis to counteract manipulation ad fake digital information, digital accessibility within everyone's reach and a gender perspective towards these digital risks. However, it is extremely relevant to know if this analysis matches with the opinion of experts and students in different countries of Europe. The goal is knowing if stakeholders may consider a training program with a possible title of “critical digital information literacy” with these ingredients as an effective and useful tool for combating the risks implicit in the management of digital information by young and older adults. The idea of critical digital information literacy is an extension of the concept of critical digital literacy [15] focused on the information analysis and management with critical thinking.

We devised an online survey to collect the information from experts in the field located in different countries of Europe. This paper will focus on the results of this survey, which could guide training providers in developing training programs to educate young adults in good practices of management of digital information and channels. The structure of this paper continues with Section II with the description of the survey and the sample. Section III presents results and the corresponding analysis and short discussion. Finally, Section IV presents conclusions and future works.

3 Description of the online survey

We launched an online survey aimed at collecting the opinion of stakeholders in the field of higher education and training to young and older adults. The online questionnaire hosted at the EU Survey system had two main sections:

- One initial for a basic characterization of the profile of the respondent
- The main section with questions on the consideration of different aspects of the recommended training program on “critical literacy on digital information”

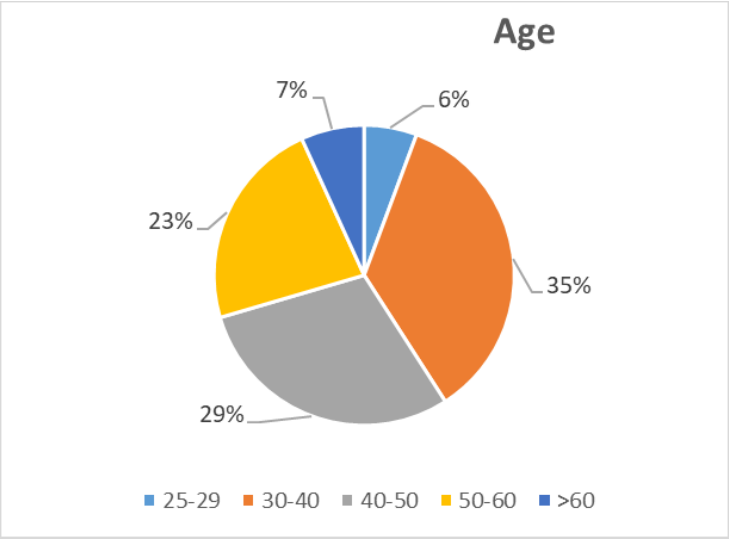

Fig. 1. Distribution of age of respondents to survey

Regarding the role of the respondents, the sample covered from students to teachers and managers in VET (Vocational Education and Training) and in Higher Education as well as some few independent experts. Representation of VET included HE and accumulated 90 responses (74.3%) distributed in Long-life learning/continuous VET (52.2% of VET respondents), training for unemployed/reskilling (11.1%) and Initial VET (36.7% of VET). The rest were in Higher Education (21.5%) with also 5 independent experts.

Regarding the role of respondents, data included:

- Students: 29.8%
- Managers and auxiliary staff: 21.5%
- Teachers and education staff: 44.6%
- Independent experts: 4.1%

Knowing the declared self-perception of knowledge on the main points discussed for the training program was also very important to detect possible influence and bias in responses caused by previous experience. Question requested to rank the knowledge and skills of respondents on the three main topics:

- Security and privacy
- Critical Thinking against digital marketing strategies
- Digital accessibility

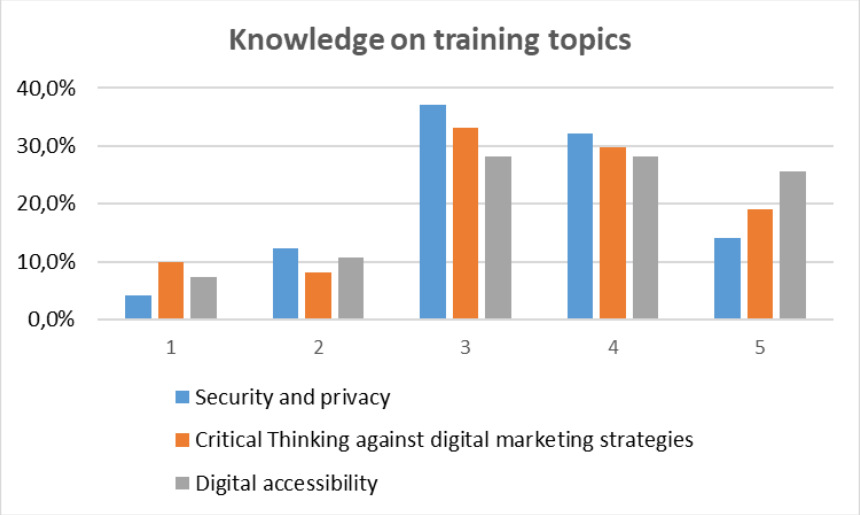

Fig. 2. Previous knowledge and skills on the three topics

The results show a higher self-perception on digital accessibility while the other are a bit lower: if we use the average value (not very adequate for this type of Likert scale), the two first topics ("Security and privacy" and "Critical Thinking against digital marketing strategies") get exactly the same value (3.96) while digital accessibility is a bit higher (3.54).

4 SURVEY RESULTS: ANALYSIS

4.1 Design of questionnaire

The analysis of the results of the questions in the training program will follow a descriptive approach. All questions use a Likert scale of five points for expressing agreement (from 1. Totally agree to 5. Totally disagree). Design of first questions explored three aspects:

- Q1. Priority in all European countries of each topic for training user in Internet interaction (e.g., "Please, indicate your agreement with the idea that the following aspects of Internet interaction of users deserve the highest priority in all European countries").
- Q.2 Existence of possible differences from one European country to another ("Please, indicate your agreement with the idea that the following aspects of Internet action of users may differ from one country to another due to different cultural approaches, specific market conditions, legislation, etc.")

- Q.3 Relevance of information and awareness ("Please, indicate your agreement with the need of informing and rising the awareness of young and adult people and teachers in different levels of vocational education and long-life learning)

These questions were applied to the three aspects examined in the survey.

- Promotion and training of digital security and privacy.
- Critical thinking as awareness against digital marketing strategies
- Accessibility as a motivating value for digital inclusion.

There were three specific questions on the importance of each of the three aspects for training:

- Q.4 "Please, indicate your agreement with the idea that training young and adult users to face digital marketing and manipulation strategies is essential for their use of the Internet".
- Q.5 "Please, indicate your agreement with the idea that training young and adult users in methods and best practices to defend their digital assets including protection against frauds, privacy, and identity threats, etc.is essential for their use of the Internet".
- Q.6 "Please, indicate your agreement with the idea of informing and motivating young and adult users of the Internet to promote digital accessibility as a solidarity activism for ensuring that every citizen (including those with special needs) has the right of accessing digital information and services. is essential for their use of the Internet".

Another question asked the most impacted group in each of the three aspects: "Please, indicate which of the following target groups are impacted by each of the following aspects of Internet activity of users". The target groups were young learners, adult learners, teachers and professionals of all sectors. Finally, there was a question on the possible influence of gender:

- "Do you agree with the idea that gender is a key factor (especially for females) in the exposure to additional threats and marketing strategies when using the Internet?"

4.2 Results

Exploring the data from the 121 responses, we can firstly analyse the consideration of the three topics in priority according to respondents' perception. We have used the first three questions to check the general consideration of interest and priority that the topics generate among respondents as well as the complexity added by difference among countries in Europe. We have calculated which percentage of them tend to agree (options "Totally agree" or "agree") versus the one of those who disagree (options "Totally disagree" or "disagree"). Table 1 shows the results of the three topics with the percentages of agree and disagree. We can see that three topics are considered a priority in Europe and the need of information and awareness; it is less clear on the relevance of the differences among countries although the percentage of disagreement is low. The topic that attracts the most support is the one of security and privacy, the second one is digital accessibility and the third is the critical thinking against the possible manipulation of marketing.

Topic	Perception	***Security and privacy***	***Critical thinking against marketing***	***Digital accessibility***
Priority in Europe	Agree	93,4%	75,2%	83,5%
	Disagree	1,7%	5,8%	2,5%
Relevance of awareness	Agree	85,1%	79,3%	79,3%
	Disagree	2,5%	4,1%	1,7%
Differences among countries	Agree	73,6%	63,6%	65,3%
	Disagree	10,7%	13,2%	11,6%

Table 1. Priority, relevance and specificity of the three topics

Regarding the need for and importance of the three topics for the training of young and older adults, the results show high levels of agreement with the importance of adding these topics to the regular training of

young and older adults (see fig. 2). Although all topics show high agreement, again security and privacy gets the highest level while critical thinking is the lowest.

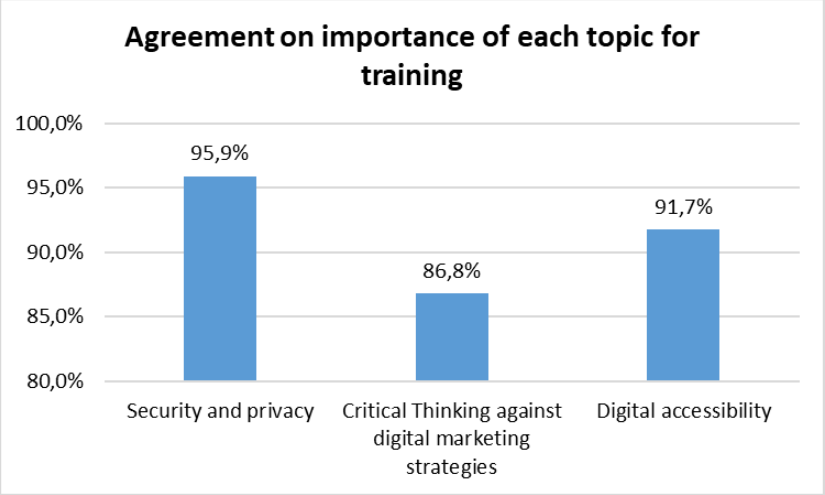

Fig. 3. Agreement on importance of each topic for training

The perception on the importance of training is different in each group of respondents. Given size of samples, we have discarded free-lance experts as the number of respondents is very low: only four. Table shows the results of those who "totally agree" or "agree" in each of the groups. The level of agreement of students regarding the need of training is lower than the one of educational managers and teachers. We do not exactly know why this happens: could it be caused by excess of confidence of students? or are teachers and managers over worried about the students?

Agreement in importance for training	**Security and privacy**	**Critical Thinking against digital marketing strategies**	**Digital accessibility**
Student	86,1%	75,0%	86,1%
Employee/manager	100,0%	96,2%	88,5%
Teacher/education staff	100,0%	88,9%	96,3%

Table 2. Importance of the three topics in each group of respondents

Albeit the agreement on the relevance of adding the three topics to the training programs is homogeneous, it is interesting to see which the target groups (young learners, adult learners, teachers, and professionals of all sectors) should be trained in each of the topics.

Target groups to be trained in each topic1	**Security and privacy**	**Critical thinking against marketing**	**Digital accessibility**
Young learners	73,6%	64,5%	67,8%
Adult learners	61,2%	66,1%	64,5%
Teachers	51,2%	43,8%	55,4%

[a. 1] Respondents could choose several target groups in each question so numbers must not total 100%:

Professionals of all sectors	73,6%	65,3%	71,1%

Table 2. target groups to be trained in each of the topics

In general, teachers are not considered so relevant as target for being trained although percentage is meaningful (between 40% and 55%). The level of agreement on the rest of groups is very similar in a range between 64% and 74% of respondents. Another possible analysis is the impact of self-recommendation of training: it happens when a member of a group recommends training the members of the same group. In the case of students, this happens when a student recommends the training to adult or young learners in at last one topic: it happens 89% of cases. The recommendation of training to teachers happened in 70,4% of respondents with profile "Teacher/education staff" and in 84,6% with profile "Educational manager".

Finally, the opinion on the influence of gender in the treatment of the critical literacy on digital information is not as clear as the results of other questions. Only 44.6% of respondent totally agree or agree.

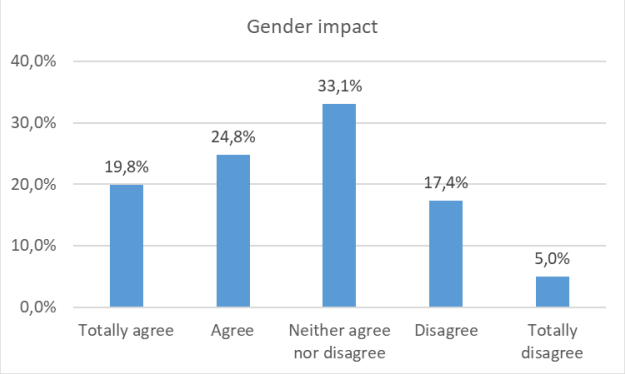

Fig. 4. Opinion on the impact of gender in critical literacy on digital information

5 Practical conclusions

This exploratory study has revealed the global agreements of all types of stakeholders on the different aspects of the critical digital information literacy, a concept of information literacy where critical thinking gains a leading role to avoid information manipulation in commercial and social contexts. A representative sample of stakeholders involved in education and training of young and older adults who responded our online survey: 121 representatives of a good range of age, different countries of Europe and with relevant roles in the educational processes. In general, most of the respondents have agreed with the priority, relevance and country dependence of the three topics on critical digital information literacy (security and privacy, critical thinking versus marketing strategies and digital accessibility). As a practical conclusion, it is recommended to address these three topics at least briefly in programs connected to information literacy to respond to the need detected in training of adults. The lowest homogeneity arises with the impact of gender, so this idea should be further explored to decide its impact in training programs.

This study may help in better addressing the training of some of these topics in fields like information literacy. Data have also strongly confirmed the importance of training in the three topics as well as a recommendation of training to all the target groups. The results of this study will help to better understand their role in implementation of training programs on information literacy, for example, in innovation projects for spreading its implementation in higher education with guarantee of responding to expressed needs by stakeholders. All types of stakeholders expressed importance of training not only young adults like undergraduates in higher education and VET programs but also older ones (probably involved in other university programs like master levels ones and long-life learning courses), without forgetting the need of training teachers.

Obviously, it is recommendable to extend this analysis to larger samples of stakeholders not only related to specific young and older adult education but also in other educational levels such as regular higher education (HE). Having larger number of respondents from all the countries would allow the exploration of more specific differences among countries as sample size for some of them is not big enough. Larger samples where the questionnaire more clearly differentiates between technical and non-technical training

programs in VET and HE to see if the perceptions of risks are different and to find out which could be the specific needs of training in each case. With bigger sample, it is also possible to explore more relations between features of profile of respondents and opinion in the different questions, possibly detecting trends in perceptions connected to age, background, role, etc.

As the topics are also closely linked to attitudes and soft skills, we also want to exploit our experience in the analysis of NCS (Non-Cognitive Skills) supported by big data and consistent frameworks and models [16]. More specifically, we want to check NCS related to topics (such as "critical thinking") in the model NCSF [17] may show differences in their consideration in the countries under the basis of the Hofstede's indicators [18]. This model is very solid and can cover the part of attitudes and other transversal skills not so clearly solved by Level5 model [19]. Using the NCSF it is possible to exploit relevant source of information like the ESCO labor classification or e-CF [20]: for example, looking at mere description of e-competence D.10 Information and Knowledge Management we can identify the NCS "organisation" within NCSF. This can be explored in the different references to have a clearer idea of the NCS recommended to be developed in training programs.

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