

Teaching online reading strategies using the Think Aloud technique. Evidence from an experimental study

Insegnare le strategie di lettura online usando il Think Aloud. Evidenze da uno studio sperimentale

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ABSTRACT The present study aimed to investigate the value of the teacher Think Aloud (TA) instructional technique in providing young readers with effective strategies to enhance the comprehension of online texts. Eighty-nine participants from 10 to 14 years of age were sorted into two groups based on the type of training they had received: the experimental group (n = 47) had been taught with the TA strategies, while the control group (n = 42) had not received any specific training. Both the experimental and control groups were examined twice, before and after the period of training. Pupils had to find the correct answer to a specific question (Access) and to critically analyze online texts, expressing different opinions on a topic (Analysis). The findings indicate a positive effect of the TA technique, mainly in the transferal of strategies aimed at a more correct evaluation of the websites' reliability. Indeed, while for the control group only a marginal, if any, improvement was recorded from pre-test to post-test, an outstanding amelioration was observed in the experimental group (from 19.1% to 48.9%) when requested to evaluate the reliability of a web site.

KEYWORDS Think Aloud Instructional Technique; Online Reading Comprehension; Metacognitive Strategies; Young Readers.

SOMMARIO Lo scopo di questo studio è stato di indagare l'efficacia della tecnica metacognitiva definita "Think Aloud" (TA) per migliorare la comprensione della lettura di testi online. Ottantanove alunni di età compresa tra i 10 e i 14 anni sono stati suddivisi in due gruppi in base al tipo di formazione ricevuta: il gruppo sperimentale (n = 47) è stato istruito secondo le indicazioni proprie della tecnica del TA, mentre il gruppo di controllo (n = 42) ha continuato a svolgere esercizi di ricerca dell'informazione senza però

ricevere alcuna istruzione specifica da parte degli insegnanti. Sia il gruppo sperimentale che quello di controllo sono stati esaminati due volte: prima e dopo la formazione. Gli alunni dovevano trovare la risposta corretta a una domanda precisa (Access) e analizzare criticamente testi online, che esprimevano opinioni divergenti su un argomento (Analysis). I risultati di questa ricerca hanno indicato un effetto positivo del TA soprattutto nella valutazione dell'affidabilità dei siti web: in effetti, mentre il gruppo di controllo non ha fatto registrare significative differenze tra pre- e post-test, la prestazione del gruppo sperimentale è migliorata dal 19% al 48%.

PAROLE CHIAVE Think Aloud; Comprensione della Lettura Online; Strategie Metacognitive; Giovani Lettori.

1. INTRODUCTION

Although for some people the Internet is a negative side-effect of technological evolution, a “deep rabbit hole” of ways to waste time (Chou, Condron, & Belland, 2005; Kraut, Patterson, Lundmark, Kiesler, Mukopadhyay, & Scherlis, 1998), nowadays the web – especially among young people – has become the most popular source of information through videos, blogs, posts, online newspapers, and more (Guan & Subrahmanyam, 2009). The Internet, however, is not only a vast, wonderful trove of information but also a source of entertainment, games and leisure, advertising and sales.

Even more importantly, the Internet is not a neutral source of information (Buckingham, 2007). Contents are aimed at different purposes (e.g., to inform, share, persuade, sell, etc.) and the authors use different media forms to shape the reader's interpretation (Leu, Kinzer, Coiro, & Cammack, 2004). In this nonlinear, unbounded space, decisions about links and texts follow one another, while several distractors and multiple stimuli compete against each other to grab the reader's attention (Cho, 2014; Egnatoff, 1999; Hahnel, Goldhammer, Kröhne, & Naumann, 2018; Kuiper, Volman, & Terwel, 2005). Consequently, the traditional reading skills are not sufficient to guarantee the complete and veritable comprehension of online contents. Thus, reading online requires a diverse set of knowledge, skills, dispositions and strategies, which are somewhat different from those involved in traditional reading (Coiro & Dobler, 2007; Leu, Kinzer, Coiro, Castek, & Henry, 2017; Leu et al., 2004).

We have addressed elsewhere (Carioli & Peru, 2016) the question concerning the cognitive processing and strategies involved in online reading comprehension, but the point we would like to raise here is that the expertise of the so-called digital natives is greatly overestimated (Helsper, & Eynon, 2010; Terry, 2018). Thus, young web surfers are usually left alone to access the online environment. Relying only on their own experience without any preliminary training that would enable them to develop analytical and critical abilities, young readers tend to adopt a naive, uncritical approach and use a range of inappropriate or superficial, if any, criteria to determine the reliability of online resources (Coiro, Coscarelli, Maykel, & Forzani, 2015). The readiness and efficiency with which search engines provide responses to whatever the user may search, make naive web surfers feel confident enough to always take what they get on the Internet for granted. More generally, naive web surfers have an inveterate tendency to accept aprioristically as true whatever is shown in electronic media (Kuiper et al., 2005; Kuiper, Volman, & Terwel, 2008), and to equate information quantity with information quality (Agosto, 2002; Zhang, 2013). Consequently, they tend to read (or skim) just the first of the search results produced by the search engine without the slightest thought for the intrinsic quality of the web pages they are reading.

That being the case, there is now a wide consensus in favor of the need for a teaching program that could prepare young web surfers to develop appropriate attitudes, strategies and knowledge to deal properly with

the overload of information available on the web (Coiro, 2011b; Zhang 2013). So far, however, young readers rarely have systematic training to learn effective strategies to read texts online. One of the main obstacles preventing effective education in the field of online reading is that primary and secondary school teachers are not adequately trained on how and when to intervene to support students' proficiency in online reading. Although international comparative investigations (Mullis, Martin, Foy & Hooper, 2017; OECD, 2018) continue to recommend that primary and secondary school students should develop a critical attitude and greater awareness on new media and communication languages, online reading is largely ignored throughout the education of primary school teachers. Actually, very few EU Member States currently define learning outcomes for digital reading (EU High Level Group, 2012), and in most EU countries media literacy education is still taught on a voluntary basis by inspired teachers (Felini, 2014).

2. THEORETICAL BACKGROUND OF THIS STUDY

What makes the difference between skilled and poor online readers has essentially to do with the ability to adopt effective strategies to monitor the adequacy and check the validity of the chosen path as well as to keep track of reading progress toward the goal (Cho, 2014; Coiro, 2011a). Proficient online readers take the time to clarify what they want to get out of the Internet before starting navigation, and keep themselves open to changes that the navigation process may present. Furthermore, they frequently stop their reading and refocus their target, adjust the navigation speed and/or direction, plan the access to the various parts of hypertext, and verify what they have understood so far (Dalton & Proctor, 2008; Coiro & Dobler, 2007). Taken together, evidence from skilled readers suggests that self-regulatory strategies can be a very promising tool to develop a training program able to serve as an adaptive scaffold in the acquisition of the skimming, scanning, searching and navigating strategies to put in control the text processing. Among the others, the Think Aloud (TA) approach has potential to model the students' strategies, promote self-monitoring and improve the reading comprehension (Block & Israel, 2004; Coiro, 2011a; Davey, 1983; Griffith & Ruan, 2008; Lapp, Fisher, & Grant, 2008; White, 2016; Sönmez & Erkam Sulak, 2018). In details, the TA is a metacognitive technique in which a teacher verbalizes thoughts aloud while reading a selection orally and consists of three main phases: modeling, guided practice, and reflection (Harris & Hodges, 1995). In a previous study, we developed a Think Aloud Teacher's Guide on the basis of the instructional model of online reading (Coiro, 2011a). This guide was used in the Massive Online Open Course (MOOC) *Stop and think. Modeling the process of Online Reading Comprehension Using Think Aloud*¹, specifically devoted to help primary and secondary school teachers to address two basic competencies:

- 1) how to find the correct answer to a definite question (Access);
- 2) how to compare online contents that express different opinions on a topic (Analysis).

In particular, by using a digital device, the teacher can create an experience of modelling: Students will listen to the verbalization of strategies that drove teacher's choices in online reading. After that, during the guided practice phase, teacher will encourage students to practice the assigned task. Finally, in the reflection phase, teacher will promote a collective reflection on the activity so that students can share their experience and cooperate to accomplish the goal (Carioli & Peru, 2016).

In view of these considerations, the present study aimed to explore the effectiveness of the TA instructional technique in supporting the development of self-regulation strategies for the comprehension of online texts. To explore the effectiveness of the TA, one pair of fifth grade classes of an Italian state primary school and two pairs of classes (second-grade and third-grade) from two Italian state secondary schools were involved

¹ <http://attiministeriali.miur.it/anno-2016/novembre/dd-07112016.aspx>

in the experimental investigation reported below.

To the best of our knowledge, this is the first study conducted in a sample of primary and secondary school students.

3. METHOD

The study was approved by the school ethics committee and students participated with parental consent. However, before starting the experimental investigation, all the participants were informed about the general aims of the study and clearly told that participation was not mandatory and they could withdraw from it at any time without problems. It is worthy to note that none of the students refused to take part in the study, nor dropped out of it.

3.1. Participants

Starting from the consideration that a) adequate basic skills in traditional literacy are a prerequisite for dealing with the complexity of online reading; b) the fourth grade of school marks a transition from “learning to read” to “reading to learn” (Mullis, Martin, Foy, & Drucker, 2012), we enrolled three pairs of classes from the fifth grade of primary school to the third grade of secondary school. According to the rules of the Italian Educational System, pupils were 10-11 y-o in the fifth grade of primary school, 12-13, and 13-14 y-o in the second and third grade of the secondary school, respectively. For each pair of classes, a coin toss was used to decide which class will serve as the experimental or control group.

Eighty-nine pupils (43 females) met the criteria to be included in the analysis:

- having carried out both pre- and post- test evaluation;
- having participated in at least 80% of TA lessons (experimental group) or internet free surfing sessions (control group).

All the participants had normal or corrected-to-normal visual acuity, had no present or previous neurological or psychiatric problems.

Alongside the students, teachers took part as well (i.e. 2 primary school teachers of Italian subject: 1 teacher for the experimental group and 1 teacher for the control group; 4 literature and history teachers for the two pairs of classes from the secondary school: 2 teachers for the experimental group and 2 teachers for the control group) participating on the basis of uninfluenced, voluntary consent. However, given that specific training is necessary to teach the TA technique (Pressley, 2002), teachers responsible for the classes enrolled in the experimental group were selected among the participants in the MOOC reported above² that took place three months prior to the start of the experimental study headed by one of the authors. By contrast, teachers responsible for the control group classes did not receive any specific training.

3.2. Procedure

An ad hoc blog created with Blogger platform and Google Drive tools served to prepare the texts, control the entire sequence of the events, and record participants’ responses. The experimental sessions were carried out in the school’s computer lab with each student working individually on a desktop computer connected to the Internet.

The study consisted of three different phases: a pre-test ran before participants received any training; a four-month training program consisting of ten 50-min lessons; a post-test carried out one month after the end of the training program.

² <http://attiministeriali.miur.it/anno-2016/novembre/dd-07112016.aspx>

In both pre- and post-tests, participants were asked to

- 1) find the correct answer to a fact-finding search task (Access);
- 2) critically analyse a text to determine and analyse the author's purpose and point of view (Analysis).

Access and Analysis steps were carried out in this fixed order in a single experimental session lasting about 1 hour with a short rest period between the two steps. Operatively speaking, as to Access, participants were presented with a question and required to surf the web to find the correct answer. In the pre-test, the question was: "*How many were the inhabitants of Pompeii in 79 A.C. when the town was destroyed by a Vesuvius eruption?*", while in the post-test the question was "*What is the definition of the word 'second' (to be read as the base unit of time) and when was it proposed first?*"

It is worth noting that, although the pre- and post-test questions refer to two different fields, both of them represent a sort of information task where participants are to find information by using the resources available on the Internet in the most effective way.

As to Analysis, participants were to compare different and/or conflicting documents from different authors on a specific topic chosen by the researchers. Students were provided with three texts about Halloween in the pre-test and about Facebook in the post-test, respectively.

In turn, during the training program, students in the experimental group were taught with the TA method, while students in the control group were to solve some information tasks without any specific indication from the teacher. Thus, students in the experimental group were shown how to solve an online reading task (e.g. to find a train time table, date, name, etc.), following the five sub-processes of Access step (Choice of Keywords, Navigation, Evaluation of website's reliability, Evaluation of info's relevance, Goal Achievement) and how to compare different opinions throughout the sub-processes of Analysis step.

In details, as to the Access step, given that previous research (Marchionini, 1989) showed that 9-y-o readers use sentences rather than single keywords, a particular emphasis was put on the way to identify the most effective keywords. Furthermore, the teachers underlined the need to carefully read the question and pay attention to the fact that the search engine suggestions do not always answer exactly what we are looking for. Then, considering the difficulties of young readers to evaluate the quality of online information (Coiro et al., 2015), the teachers insisted on applying appropriate strategies to assess the reliability of authors, sites and content. Finally, based on the idea that it is necessary to surf a certain number of websites to implement the process of triangulation (Colaric & Jonassen, 2001) (i.e. search-identification of other sources that support the information found), the trainers emphasized the need to surf more than one single website to obtain the reliable information.

As to the Analysis step, the teachers analyzed and compared different and/or conflicting documents from different authors on a specific topic and gave several examples of how to select the most important parts of an online text, how to identify the author's purpose and to summarize his/her point of view.

4. RESULTS

Students' performance was rated by five experts on digital reading, chosen from teachers who took part in the MOOC, but blind to the aims of the study. For both Access and Analysis, several, different, sub-processes were considered and evaluated mainly from a quantitative (Access) or qualitative (Analysis) point of view.

4.1. Access step

As to Access, five sub-processes (i.e., Choice of Keywords, Navigation, Evaluation of website's reliability,

Evaluation of info's relevance, Goal Achievement) were scored on a scale from 0 to 2, where 0 indicated no or completely wrong answer, and 2 indicated that all the response criteria have been satisfied (see Table 1 for details).

Sub-processes	Indicators	Score/level	Descriptors
Choice keywords	Choose the most appropriate keywords to satisfy the query.	0	= no or inappropriate keyword (e.g., Google, Wikipedia, Yahoo)
		1	= only 1 correct keyword
		2	= 2 or more correct keywords
Navigation (number of websites)	Plan the reading path: scroll the results provided by the search engine and select the most appropriate sites to navigate to find the information pursued.	0	= wrong selection or only 1 site
		1	= selection of 2 site
		2	= navigation through 3 or more sites
Evaluation of website's reliability	Evaluate the online content and website's reliability on the basis of: author's credentials (e.g., educational background); triangulation among different sources; presence evaluation of information such as "About Us", "Contact", or indicators of quality, such as working/external links to other trusted sites; frequency of updating; additional information included in the URL (e. g. if the domain extension is appropriate for the content .edu, .org, .com, etc.); type of website management (local, national, international) and appropriateness to the content.	0	= no indicator considered – No criteria (or student wrote: "I do not know", "no", "nothing", ...)
		1	= only 1 indicator considered
		2	= 2 or more indicators considered
Evaluation of Info's relevance	Gather information pertinent to the issue.	0	= no pertinence at all
		1	= partial pertinence
		2	= full pertinence
Goal achievement (Correct Answer)	Integrate logically information from selected pages to satisfy the query.	0	= no or wrong response
		1	= partially correct response
		2	= full satisfaction of query

Table 1. Access Step - Scoring procedures.

Given that the two groups were not the same size, for each sub-process and for each group considered, the composite score was computed by multiplying the percentage (instead of the number) of participants by the point they scored.

	Experimental Group (n = 47)		Control Group (n = 42)	
	Pre-test	Post-test	Pre-test	Post-test
<i>Key words</i>	1,1277 (0,9695)	1,3617 (0,9190)	0,9286 (0,9472)	1,0952 (0,9321)
<i>Navigation</i>	0,6809 (0,6629)	0,9787 (0,6423)	0,9286 (0,676896)	0,9286 (0,7455)
<i>Reliability</i>	1,0426 (0,5882)	1,3617 (0,7048)	1,1429 (0,5213224)	0,9762 (0,7153)
<i>Relevancy</i>	1,3617 (0,7919)	1,4894 (0,7766)	1,2143 (0,8421)	1,3810 (0,8250)
<i>Goal achievement</i>	1,1064 (0,9832)	1,2979 (0,9305)	1,2143 (0,9509)	1,2619 (0,9386)

Table 2. Access Step - Groups' performance: mean and (sd).

The raw (i.e., from 0 to 2) score achieved by each participant was inserted into a repeated measure ANOVA with Group (Experimental vs. Control) as the between-subjects factor and Task (five levels: Choice of Keywords, Navigation, Evaluation of Website's reliability, Evaluation of info's relevance, Goal Achievement) and Time (Pre-Test vs. Post-Test) as the within-subjects factors with Bonferroni correction for multiple comparison and a p value < .05 as index of significance.

The factor Time [$F(1, 87) = 21,541$; $p < .001$] was highly significant because overall participants' performance improved from pre- to post-test. In turn, the factor Task [$F(4, 348) = 25,189$; $p < .001$] was highly significant because participant's performance was better on Relevancy than on each other task ($p < .001$ in all cases) and worse on Navigation than on each other task ($p < .001$ in all cases). On the opposite the factor Group was not significant. As to interactions, the interaction Time by Task was far from significance, while the interaction Task by Group [$F(4, 348) = 3,807$; $p = .005$] was significant because the differences across tasks were more evident among the experimental than the control group. Even more interestingly, the interaction Time by Group [$F(1, 87) = 10,269$; $p = .002$] reached significance because the improvement from Pre- to Post-test was larger among the Experimental than the Control group (see Figure 1). Finally, also the second level interaction Task by Time by Group [$F(4, 348) = 4,398$; $p = .002$] was significant because while the experimental group showed consistent improvements across Time in all the domains, the control group's performance was much more variable with some improvements and some declines (see Table 2 for details).

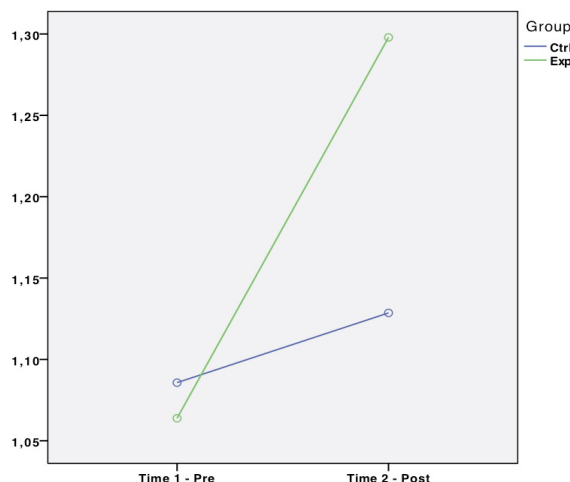


Figure 1. Groups' performance across Time.

Considering the participants' performance in the specific sub-processes, the most evident outcome is that many of them (i.e., 11.3%) were unable to answer the question: "Explain the main reasons why you think this resource is reliable", while most of them (i.e., 68.5%) reported subjective criteria because they only relied on their own experience, or based the answer on a fideistic and axiomatic acceptance of Internet contents. Among them, just a few had traced back their reliability reasons to the source factor (e.g., "*It is on the Internet, then, for me it is reliable*"; "*I found the answer to the question on Google*"; "*Google is reliable*"; "*I usually use Yahoo, therefore, for me the answers are right*"; "*Wikipedia is a free encyclopedia and tells true facts*"; "*I know that Wikipedia gives the right information about History*"; "*I entrusted myself to this site*"; "*It is a fast and reliable site*"; "*I trust what they write*"; "*I always trusted them*"; "*I think the author has lived in those times, then knows the story of that period*"). There were pupils who used the search engine rankings as a reliability factor, (e.g., "*It is the first I found*"; "*I'm not sure that it is reliable, but it is the top search result for this topic*"), while others explained their choice arguing "*The page is set up well*"; "*For the way in which information is written*"; "*It is the only site that has given me a complete response*"; "*It informs me a lot*"; "*It tells the facts as they are happened and there are many testimonials*"; "*It is true because it really happened*"; "*There are many historical facts that I know to be true*". The 20.2% of the participants reported criteria labelled as "objective", supported by converging evidence from different sources. Some of them compared the information found with those from other sources (e.g., "*Afterward I looked at other sites and found the same information*"; "*I have seen a science DVD saying the same thing*"), someone analysed the site (e.g., "*The site is a cultural association, so I suppose that these are real things*"; "*In the bottom there are sources and copyright*"), while few of them checked the presence of the author's name (e.g., "*There is the bibliography and the name of the author*"; "*I think that are reliable only the sites that have the author's name on top*").

Another finding worthy to be noted concerns Navigation. While in the pre-test a significant number of participants did not go beyond a single website to find the information, in the post-test, the percentage of participants who browsed more than one website markedly increased. Even more interestingly, such an increase was more evident in the experimental than in the control group.

4.2. Analysis step

As to Analysis, four sub-processes (Identifying the title and the author, Identifying the author's point of view (POV), Identifying the author's purpose, Summarising the content) were scored on a scale from 0 to 2, where 0 indicated no or completely wrong answer, and 2 indicated that all the response criteria have been satisfied (see Table 3 for details).

Sub-processes	Indicators	Score/level	Descriptors
Identifying the title and the author	Select the title and the Author's name.	0	= no or wrong response
		1	= title or author
		2	= title and author
Identifying the author's POV	Select the most informative parts of the texts (i. e. words, images, photographs, video, music) to understand the Authors' point of view, that is what he/she really thinks about the given topic.	0	= no or provided an inaccurate statement about author's POV
		1	= identify parts of text but not explain author's POV
		2	= identify parts of text and explain author's POV
Identifying the author's purpose	Discern the author's purposes, going beyond a superficial reading.	0	= no or copy and paste citations haphazard or infer the purpose from the apparent features of the site
		1	= only the evident/stated purpose
		2	= stated purpose + implicit/not evident author's purposes
Summarising the content	Express the most important facts or ideas in a short and clear form.	0	= no or wrong response
		1	= copy and paste the most significant parts
		2	= full satisfaction

Table 3. Analysis Step - Scoring procedures.

To identify the title and the author turned out to be the easiest task to be solved with both groups scoring near the top, especially in the post-test session (see Table 4 for details).

In contrast, almost half of the participants encountered difficulties in identifying the author's purpose and POV, especially in case of double purposes (e.g., to inform, but also to induce readers to buy). For example, after reading text 3 in the pre-test session (Which horror video do you like the most?, a web page with video, banner, photos, words, links) only one participant reported the two intentions of the authors: *"In order to induce young people to watch the video on the characters of the soap opera AND to buy the Halloween products"*, while approximately 40% of participants reported the declared purpose (e.g., *"Initially presented with a game, which then lead to commercial pages"*) OR the implicit purpose (e.g., *"To intrigue and influ-*

ence the young people”, “To introduce readers to the world of the soap opera”, “To induce readers to buy”). Interestingly, from the pre- to the post-test phase both groups improved their performance on the author’s purpose sub-process, although such an improvement was more evident in the experimental (mean improvement about 50%) than the control (mean improvement about 20%) group.

Many students did not respond at all to the request to summarise, and overall, only about one third of participants succeeded in the task, while the remaining two thirds did not go beyond copying and pasting part of the text or the title. In other cases, an interpretation bias was evident. For example, when requested to summarise Facebook’s pro and cons, one student simply wrote: “Facebook should not be used”, rather than reporting the analysis on pros and cons shown in the article.

Finally, it is very important to note that only the experimental (mean improvement about 50%), but not the control group improved the performance from the pre- to the post-test phase.

Pre Test			Post Test		
	Experimental Group (n = 47)	Control Group (n = 42)		Experimental Group (n = 47)	Control Group (n = 42)
<i>Text 1</i>	LA STAMPA		<i>Text 1</i>	IL PICCOLO	
Title	81%	81%		94%	88%
Author	98%	88%		96%	98%
Purpose	49%	71%		96%	79%
Summary	25%	50%		87%	43%
<i>Text 2</i>	FOCUS		<i>Text 2</i>	LA REPUBBLICA	
Title	87%	69%		94%	79%
Author	87%	69%		77%	76%
Purpose	55%	57%		79%	69%
Summary	49%	45%		68%	38%
<i>Text 3</i>	IL MONDO DI PATTY		<i>Text 3</i>	TELECOM	
Title	40%	33%		100%	76%
Author	45%	33%		100%	90%
Purpose	40%	43%		72%	45%
Summary	21%	26%		64%	26%

Table 4. Analysis Results.

5. DISCUSSION

Consistent data show that an effective online reading involves a specific group of different skills and self-regulation strategies which serve to monitor the adequacy and check the validity of the online reading path (Coiro & Dobler, 2007; Goldman et al., 2010; Goldman et al., 2012; Hahnel et al., 2018; Leu et al., 2004; Leu et al., 2017; Naumann & Salmerón, 2016; Salmerón, Cañas, Kintsch, & Fajardo, 2005; Salmerón & García, 2011).

The issue regarding the debate about the relationship between online reading skills and online reading strategies goes beyond the aims of the present paper. Rather, we presented an exploration of the effectiveness of the TA instructional technique to provide young pupils with effective strategies for a comprehension of online texts.

The experimental group was trained according to the TA procedures, while the control group did not receive any specific training. Both experimental and control participants were examined twice, before and after the period of training.

In both pre- and post-test two variables were considered: Access and Analysis. The first was evaluated in terms of the ability to find the correct answer to a precise question, while the latter was evaluated in terms of the ability to critically analyse online texts that express different opinions on a topic in order to determine the author's purposes and his/her point of view (Hobbs, 2010; Hobbs & Moore, 2013).

Online reading requires a self-directed selection and organization of text materials: A *“better self-regulation goes together with better navigation, and better navigation partly mediates effects of self-regulation on learning outcomes in online learning scenarios”* (Naumann & Salmerón, 2016, p. 44). In this study, the significant increase in the percentage of participants in the experimental group that – after the training – considered more than one website to find the information, as well as the positive correlation with the achievement of the reading goal, provide support to this argument.

In other words, our findings confirm the effectiveness of the TA technique to empower learners to develop self-regulated reading (Afflerbach & Cho, 2009; Azevedo, 2005; Azevedo & Cromley, 2004; Azevedo, Guthrie, & Seibert, 2004; Block & Israel, 2004; Coiro, 2011a; Coiro & Dobler, 2007; Kymes, 2005; Minguela, Solé, & Pieschl, 2015; Pressley, 2002). Furthermore, it is of particular relevance to compare the performance of experimental and control group when requested to evaluate the reliability of a web site. While for the control group only a marginal, if any, improvement was recorded from pre-test to post-test, an outstanding amelioration was observed in the experimental group (from 19.1% to 48.9%). Given that an inappropriate evaluation of the reliability of a specific website seems to be one of the main obstacles to effective online reading (among the others: Coiro et al., 2015), our data confirm that a TA training can help learners to overcome this difficulty. A well-structured procedure like the TA approach may help web surfers to evaluate the reliability of a website based on objective criteria and to distinguish true reliability from simple relevance.

Strictly linked to the difficulty of a correct evaluation of the websites' reliability, is the young readers' tendency to accept as true whatever found in internet (Kuiper et al., 2008; Wallace et al., 2000; Zhang, 2013). Also in our study, the young pupils demonstrated a worrisome tendency to accept aprioristically each content shown on the screen.

Regarding the Analysis step, the most interesting finding concerns the students' ability to summarise the main contents of the web pages they have been presented with. Once again, it turned out that the amelioration observed from pre-test to post-test was much more evident among experimental than control participants. In other words, it seems that the TA procedure succeeded to improve online reading comprehension, likely because it helps online readers to “synthesize information from various parts of the text and

different texts”, a fundamental sub-skill of the comprehension construct (Paris & Stahl, 2005). However, a deeper, albeit qualitative, analysis of the participants’ responses clearly reveals that their interpretation of online texts was strongly affected by a priori, consistent biases, either positive or negative (see for instance, responses to text 1 and 2 in the post-test phase). Generally speaking, these results can be explained by assuming that the way young people approach the Internet medium is critically modulated by their cultural background. In view of these considerations, there shouldn’t be any need to emphasise the importance to make young web surfers more aware of the risks of a naive approach to the Internet environment.

A final point deserves comments. This study also sheds light on the students’ lexical knowledge. Quite surprisingly, many participants did not have a clear idea of what a keyword is and ignore the difference between a keyword and a search engine. Moreover, many of them were fully unaware of the meaning of the word “reliable” and not always the teachers’ explanation was successful to overcome this lack of knowledge.

6. CONCLUSIONS

To sum up, our results confirm that the TA instructional technique has potential to empower learners to develop self-regulated reading. Nevertheless, several issues remain to be addressed. First, it would be interesting to replicate the study by using similar conditions in the pre- and post-test (i.e. questions from the same subject area). Even more importantly, our data need to be substantiated by additional evidence from a larger sample of participants. Moreover, future studies should involve high school students, in order to verify the suitability of this approach in more expert web surfers, too. A longitudinal, rather than a cross-sectional, study would be very helpful to clarify the influence of the factor age in identifying the author’s purposes and other relevant information, and to verify if this ability evolves across time. Even more importantly, the TA approach should be compared with a different approach to the online reading comprehension rather than with a “no training” condition.

However, notwithstanding these limitations, the findings from this study may be useful for both educational and scientific purposes.

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