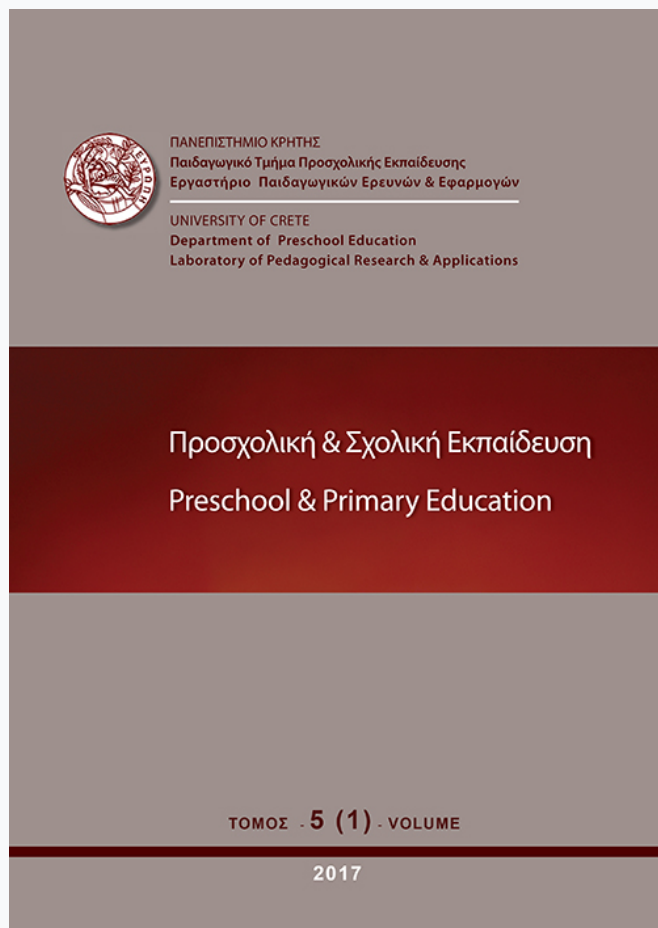


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Web literacy practices of teacher education students and in-service teachers in Greece : a descriptive study

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Web reading practices of teacher education students and in-service teachers in Greece: A descriptive study

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Summary. In the expanding context of new literacies, the abilities to know how to locate and evaluate web information resources so as to construct knowledge are acknowledged as extremely important worldwide. Current literacy curricula should encourage the development of such abilities, and their successful implementation requires that teachers themselves are properly prepared. The present study reports the web searching and evaluating practices for educational purposes employed by both pre-service and in-service teachers. Data were collected via an anonymous online questionnaire. The descriptive study exhibits teachers' web reading practices with the purpose of identifying aspects that require attention when designing and implementing relevant educational initiatives. According to the findings of this research, both pre-service and in-service teachers almost exclusively use popular search engines to locate web information resources, and they choose such resources without examining their wider context. To evaluate web information resources, they consider mainly morphological and design elements, rather than content features such as their origin and credibility. The findings raise the potential of applying critical literacy principles on the Web so that teachers can approach it criticallyⁱ when using its resources in educational settings.

Keywords: web reading practices, teacher education students, in-service teachers, Greece

Introduction

The web, perhaps the most popular branch of the Internet, is tending to become the main channel for information, communication, and entertainment nowadaysⁱⁱ. Concerning children in the current developed countries, the web seems to be omnipresent in their lives. Young people today make widespread use of web information resources, social networking platforms, blogs, wikis, online games and open access resources and constitute the so-called net generation (Tapscott, 2009; Vafopoulos, 2013). Research findings in Greece (Kokkevi, Stavrou, Kanavou, & Fotiou, 2015) showed that 6 out of 10 adolescents between the age of 13 and 15, spend at least 5 hours a day in front of a screen during the week and 8 hours a day during the weekends. In the same study, 2 out of 5 adolescents (43,4%) reported that they spend at least 2 hours daily on the Internet, searching for information concerning school assignments and social networking/communicating with friends. Another study in the

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United Kingdom showed a strong tendency among young people to read less outside the classroom; it notes, however, that only reading ebooks and text messages has increased from 2005 to 2012 (Clark, 2013). According to the latest (2013/14) Health Behaviour in School-aged Children (HBSC) survey with data from 44 countries across Europe and North America, on average one out of two of 13-year-olds use a computer for email, Internet or homework for two or more hours on weekdays (Inchley et al., 2016). Reading online plays a constantly growing role in both children and young people's choices of reading practices, and consequently, the evolution of their literacy, while the power of books and of print as the dominant spaces for the representation of meaning is questioned (Kress, 2003).

On the other hand, both the Internet and the web were not designed for use by children, nor for use in educational settings, although their use in classrooms has been steadily increasing (Fabos, 2004; Kuiper, Volman, & Terwel, 2005, 2009). For example, research findings so far, although limited, show that hypertext reading on the web -which implies navigating in various, non-linear ways via links- increases readers' cognitive load, especially when resources not exclusively designed for educational purposes are considered (DeStefano & LeFevre, 2007). In addition, the web nowadays constitutes an information space where commercial interests dominate (Fabos, 2004, 2008) and personalized information-gathering techniques are extensively applied to serve exactly these interests (Pariser, 2011). Consequently, "children must learn how to make it a useful contribution to their learning processes" (Kuiper & Volman, 2008, p. 242).

Considering the web as a new learning medium, however, requires new skills and attitudes that both teachers and students should possess so as to become capable of evaluating the content credibility and usefulness of web information resources (Bruce, 2000; Burbules & Callister, 2000; Coiro, 2003; Wyatt-Smith & Elkins, 2008). Teaching children to deal critically with the form and content of the web, means to empower them with the abilities not only successfully to handle more information resources, but also to master a medium for their independent lifelong learning and for their effective participation in economic, social and political settings. Therefore, there is a need to develop web literacy, a set of abilities "to recognize and assess a wide range of rhetorical situations and an attentiveness conveyed in a source's non-textual features. Teaching such a literacy means supplementing the evaluative criteria traditionally applied to print sources with new strategies for making sense of diverse kinds of texts presented in hypertextual and multimedia formats" (Sorapure, Inglesby, & Yatchisin, 1998, p. 410). Current web 2.0 tools (e.g. blogging platforms, wikis, media-sharing sites, podcasting, text messaging, social networks, social bookmarking sites) possess highly interactive features by prompting the reader to add content and become a writer. These could be of great value when used in classrooms to encourage writing and collaboration. Promising efforts are being made to propose a web 2.0 pedagogical framework to guide teachers' development towards the effective implementation of web 2.0 tools in the classroom to enhance students' learning (Jimoyiannis, Tsiotakis, Roussinos, & Siorrenta, 2013). Taking these into account, we could expand the above definition of web literacy and consider it as an umbrella term, encompassing a range of interrelated abilities to read, write and collaborate online.ⁱⁱⁱ

There have been large scale surveys to assess adolescents' abilities to read and understand digital texts (Organisation for Economic Co-operation and Development-OECD, 2009) and there have been reported efforts to diffuse web literacy in primary and secondary education settings (Brown, 2011; Kuiper et al., 2009). On the other hand, teachers are considered to be the gateway to literate societies, and their role is crucial in providing students with diverse opportunities to learn to read, understand, and interpret web information resources in a critical manner. Teachers are prompted to be engaged themselves and with their students in web literacy practices in the context of a broader reinforcement of Media and Information Literacy (Education and Behavioral Sciences Section-EBSS Instruction for

Educators Committee, 2011). This presupposes that first the teachers themselves have to become dialectical readers of the web (Bruce, 2000). Ensuring that teachers are web competent and are able to integrate these skills into their instruction is not an easy goal to achieve and there is work to be done through both their initial education and in-service training (Albion, 2007; Cannon, 2007; Laverty, Reed, & Lee, 2008). In this light, the current study focuses on investigating the web reading abilities of teacher education students and in-service teachers in Greece, and to identify any differences. Its ultimate goal is to indicate aspects to be considered when designing and implementing educational initiatives towards the improvement of teachers' web reading abilities.

Methodology

The research involved a total of 138 people, of which 70 were senior students of the Department of Primary Education at the Aristotle University of Thessaloniki, 27 were in-service teachers of primary education, and 41 in-service Information and Communications Technology (ICT) teachers. It should be noted that the 68 in-service teachers surveyed were chosen among those who had been trained in ICT (level B, advanced level), because this training included modules about seeking and evaluating web information resources to assist their teaching.

Of the total of 138 participants, 76% were women and 24% men. Almost all of the teacher education students (69 of the 70) were aged between 20 and 25 years, while 61 of the 68 in-service teachers were aged between 26 and 50 years.

Data were collected via the completion of an online anonymous questionnaire that was sent by e-mail during autumn 2014. The researchers consulted previous studies (Hirata & Hirata, 2010; Pariera, 2009; Rains & Karmikel, 2009; Wu & Tsai, 2005) for the design of the questionnaire. The self-report questionnaire consisted of 49 questions, grouped into 5 thematic categories:

- web use (e.g. how often do you use the web to get information in a typical six - month period?), attitudes towards the web (e.g. do you believe that primary education pupils can find information from authentic sources when using the web?)
- web searching practices (e.g. how often do you use only one search engine when searching the web? how often do you find what you are searching for?),
- web reading practices (e.g. how often do you read titles and indexes of websites?),
- web evaluation practices (e.g. how often do you believe in information accuracy of popular websites; how often do you prefer to read websites because their appearance is interesting and appealing to you? how often do you prefer to read websites which contain information in multiple forms?).

As far as the frequency of their practices is concerned, the participants responded to 36 questions designed with a 5-point Likert type scale ranging from "never"=1 to "always"=5. There was, also, a 5-point Likert type scale ranging from "totally disagree"=1 to "totally agree"=5 for another 8 questions concerning their attitudes towards the web (reliability statistics: Cronbach's Alpha=0,826). There were also 3 multiple choice questions:

- a. When using the simple search of a search engine, do you search: 1. only the title, 2. only the subject, 3. the whole text of information resources, 4. I do not know/no answer.
- b. Which of the following is the most reliable way to search for an online education resource: 1. search the web in general through a popular search engine, 2. use the library's website, 3. ask a colleague, 4. I do not know/no answer.

c. Which is the best source to search for articles about information technology in primary education: 1. a specialized database which covers education issues (e.g. ERIC), 2. the web in general, 3. a colleague, 4. I do not know/no answer.

In addition, there were 2 open ended questions (a. Are you satisfied with what you find on the web? Please, explain why; b. Which web information resources do you consider useful for teaching, and why?).

Results

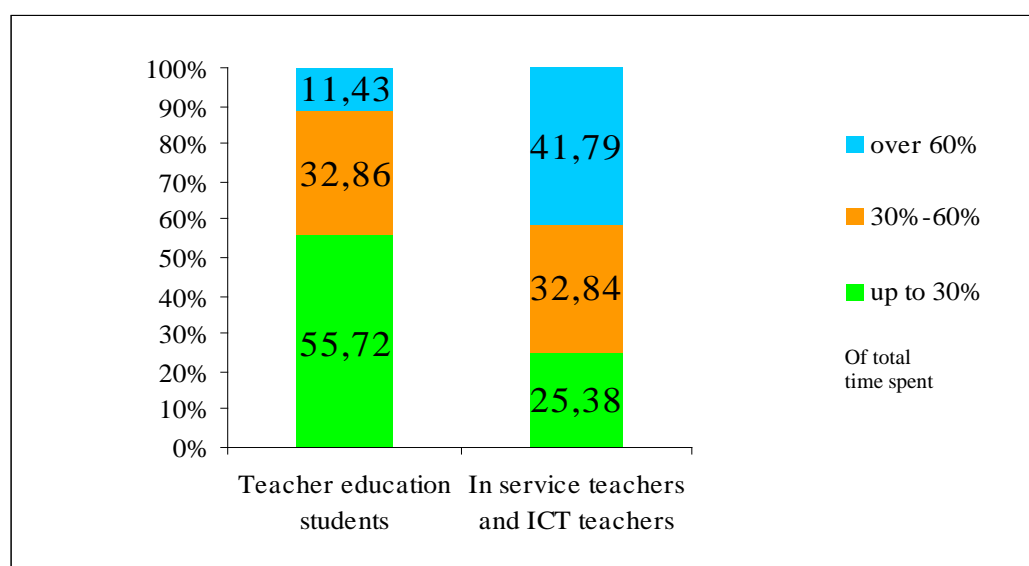
Web use

Both pre-service and in-service teachers use the web frequently:

- 74.5% of the teacher education students, 61.23% of the primary education teachers, 74.8% of the ICT teachers, use the web at least once a day to extract information.
- 74.3% of the teacher education students, 24.2% of the primary education teachers, 35.71% of the ICT teachers, use the web at least once a day for entertainment.

From the total time spent in the web to extract information in general, Graph 1 shows how much time the participants spend for extracting information specifically about education issues.

From the total time spent in the web to extract information in general, Graph 1 shows how much time the participants spend for extracting information specifically about education issues.



Graph 1 Time spent getting web information about education issues

Attitudes towards the Web

Both pre-service and in-service teachers reported varying degrees of positive attitudes (agree/strongly agree) concerning the use of the web by primary education pupils and teachers (see Table 1). As far as primary education pupils are concerned,

- 70% of the teacher education students, 62% of the primary education teachers, 55% of the ICT teachers, agreed/strongly agreed that pupils can use the web to seek information about various subjects.

- 59% of the teacher education students, 50% of the primary education teachers, 52% of the ICT teachers, agreed/strongly agreed that pupils can use the web to locate information about current events.
- 39% of the teacher education students, 54% of the primary education teachers, 33% of the ICT teachers, agreed/strongly agreed that pupils can use the web to find information from authentic sources.
- 51% of the teacher education students, 38% of the primary education teachers, 33% of the ICT teachers, agreed/strongly agreed that pupils can use the web to develop critical thinking.

As far as primary education teachers are concerned,

- 86% of the teacher education students, 92% of the primary education teachers, 95% of the ICT teachers, agreed/strongly agreed that teachers can use the web to seek information about various subjects.
- 76% of the teacher education students, 85% of the primary education teachers, 98% of the ICT teachers, agreed/strongly agreed that teachers can use the web to locate information on current events.
- 60% of the teacher education students, 81% of the primary education teachers, 88% of the ICT teachers, agreed/strongly agreed that teachers can use the web to find information from authentic sources.
- 70% of the teacher education students, 69% of the primary education teachers, 89% of the ICT teachers, agreed/strongly agreed that teachers can use the web to develop critical thinking.

Table 1 Primary education pupils and teachers can use the web to:

| | Teacher education students | | Teachers | | ICT teachers | |
|---|----------------------------|----------|----------|----------|--------------|----------|
| | Pupils | Teachers | Pupils | Teachers | Pupils | Teachers |
| Seek information about various themes | 70% | 86% | 62% | 92% | 55% | 95% |
| Locate current events | 59% | 76% | 50% | 85% | 52% | 98% |
| Find information from authentic sources | 39% | 60% | 54% | 81% | 33% | 88% |
| Develop critical thinking | 51% | 70% | 38% | 69% | 33% | 89% |

Web searching practices

The vast majority of the participants reported that they usually search the web using only one search engine (97% of the teacher education students, 100% of the primary education teachers, 86% of the ICT teachers).

In addition, they know and use advanced search techniques (e.g. Boolean and other operators) only sometimes or even rarely (71.42% of the teacher education students, 53.85% of the primary education teachers, 42.86% of the ICT teachers).

A large number of both pre-service and in-service teachers declared that they usually remain committed to their initial purpose during web searches (70% of the teacher education students, 96.16% of the primary education teachers, 83.33% of the ICT teachers).

Almost one third of the teacher education students (35.71%) and the ICT teachers (33.33%) and half of the primary education teachers (50%) reported that they are usually

impatient to locate one and only one resource that appears to possess the most appropriate information. On the other hand, a large number of teacher education students (75.76%), primary education teachers (55.77%) and ICT teachers (79.76%) claimed that they usually read various websites about the same topic. In other words, the participants claimed that they keep searching and reading resources with similar content after locating the first web information resource relevant to their information need.

Concerning their knowledge about the function of a search engine, almost one third of all research groups thought that by inserting keywords in a simple search one was searching exclusively for the title or the subject of a resource, while others chose not to answer.

Still, they usually depend on web searching in general (that is, searching the web through a commercial search engine), when they look for:

- the most credible education resources (45.71% of the teacher education students, 50% of the primary education teachers, 61.9% of the ICT teachers),
- the most current education resources (35.71% of the teacher education students, 53.85% of the primary education teachers, 42.86% of the ICT teachers).

When asked if they were satisfied with what they found on the web (first open ended question), the vast majority of both pre-service and in-service teachers (131 out of 138, 95%) consider their web searching successful because "I always find something relevant to what I am searching for". Only a small percentage of the whole (7 out of 138, 6%) thought that they failed in their searching either because they searched for something complicated or they searched in a non-effective way.

Web reading practices

In descending order, the participants' most frequent web reading practices are (see Graph 2):

- consulting a website's title and index
- scanning for words that they already have in mind
- reading word forward (like a text in a language different from our mother tongue)
- reading without any help.

Web evaluation practices

To evaluate the accuracy of web information resources, the participants stated in descending order that they usually compare these resources with:

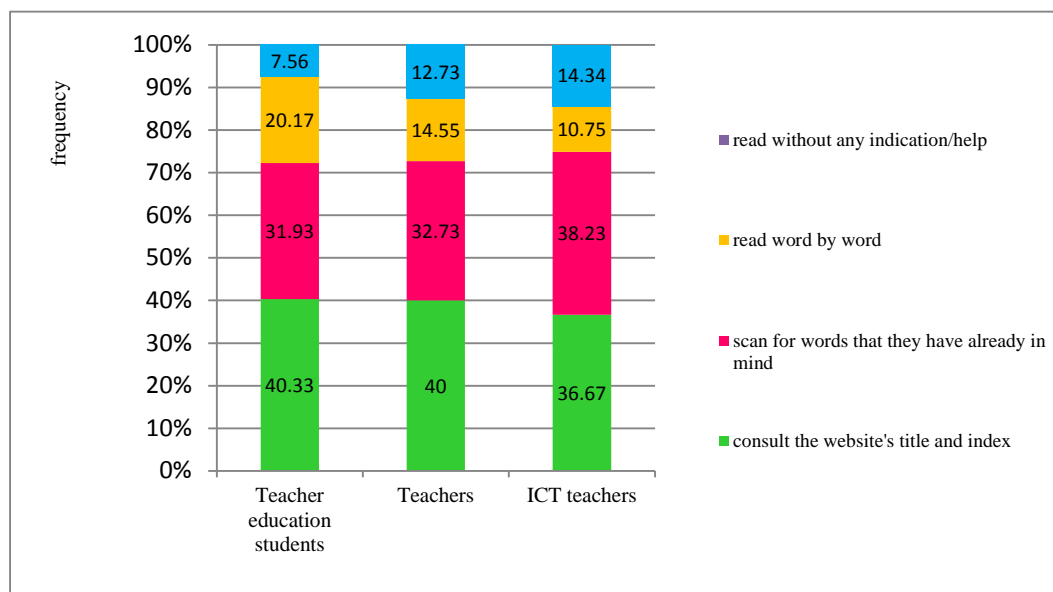
- other web information resources (50.46% of the teacher education students, 44.9% of the primary education teachers, 49.36% of the ICT teachers),
- books and other printed resources (28.97% of the teacher education students, 32.65% of the primary education teachers, 26.58% of the ICT teachers),
- discussions with classmates/colleagues (20.56% of the teacher education students, 22.45% of the primary education teachers, 24.05% of the ICT teachers).

Both pre-service and in-service teachers reported that in descending order they usually trust web information when it is published in (see Graph 3):

- websites suggested by their classmates/colleagues (46.55% of the teacher education students, 48.83% of the primary education teachers, 39.51% of the ICT teachers),
- professional and official websites (38.79% of the teacher education students, 32.56% of the primary education teachers, 38.27% of the ICT teachers),
- popular websites (14.66% of the teacher education students, 18.61% of the primary education teachers, 22.22% of the ICT teachers).

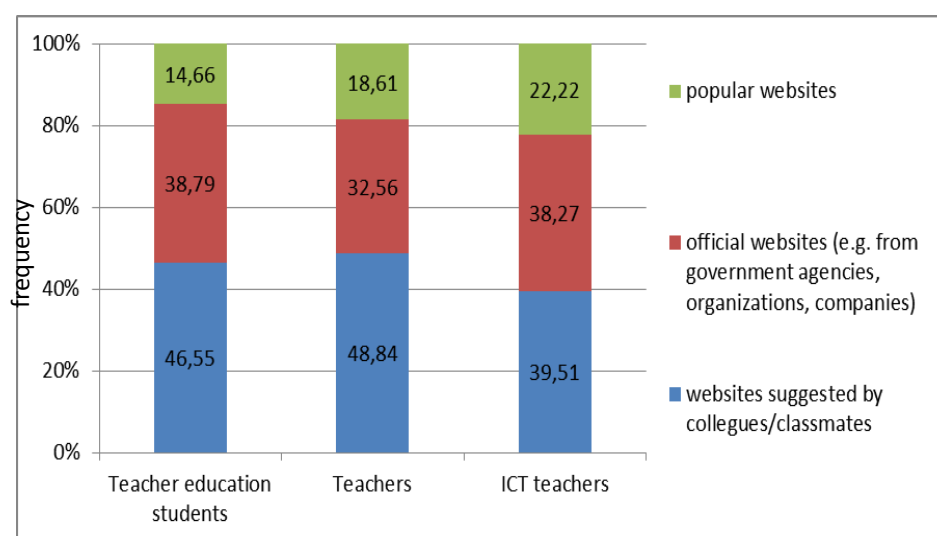
Almost half of the participants of all groups usually prefer reading web resources favouring morphological elements such as easy-to-use interface, attractive and interesting

appearance, stable and clear structure, multimodal information, while the other half usually sets as a priority content elements such as wealth of information, regular renewal, links to other sources, reliability.



Graph 2 The most frequent web reading practices

Regarding the usefulness of web information, more than half of all research groups (54%) usually prioritize morphological elements, such as whether information is presented via video/movement and in an attractive way, or whether access to information is instant and no password/sign up is required. The remaining 46% evaluate the suitability of web information resources by assessing content elements first, such as content matching with teacher's purposes and providing links for further research. One participant stated that "web information is useful when there is a multi-faceted presentation of educational issues and various/different perspectives and experiences", while another one reported that "I find web information useful only when it matches the learning and pedagogical theories that I support".



Graph 3 The most frequently trusted web resources

Discussion

The research findings reveal a significant difference between pre-service and in-service teachers concerning the purpose of using the web. Recreation seems to be the dominant purpose of web use for teacher education students aged between 20 and 25 years old. Such students are considered natives of the Internet, the so-called 'net generation' - those born since the early 1990s (Tapscott, 2009). Their adolescence coincided with the advent of web 2.0 (greater interactivity) and the expansion of social media. Socialization now happens via the Internet too. This seems to be true particularly for younger generations (Vafopoulos, 2013). Nowadays, teacher education students need no further help to communicate with each other and express themselves via web platforms. This could imply that any web teaching intervention should not focus on the technical skills required to handle web applications, but rather on the reflection upon the context of such communication and its implications for shaping our life and culture.

As far as teachers' attitudes are concerned, all groups had a high opinion of the web's potential as an information resource, and particularly for its currency. Still, respondents seemed sceptical about pupils' abilities to utilize the web to find primary information sources and to develop critical thinking. Such reservations have already been reported since the beginning of web use in educational settings (Kuiper et al., 2005). On the other hand, the vast majority of the participants agreed/strongly agreed that primary education teachers can find information on what they were studying, explore recent and real events and data, find material from authentic sources and strengthen their critical capacity by using the web (Table 1). Other studies have also reported graduate teachers' high levels of confidence when using web information resources (Cannon, 2007). Such an attitude, however, ascribes any inability of using the web to the young age of the pupils mainly, rather than to the ways that information is structured and presented on the web. This may be an obstacle towards discovering the rhetorics of web information resources and clarifying the politics of the web on the part of teachers.

Search engines, in fact only one, are the primary/unique tool with which teachers gain access to web content. Such data are consistent with respective studies of the last fifteen years (Albion, 2007; Laverty et al., 2008). In the U.S., periodic polls show that the use of search engines is one of the most popular activities online (Purcell, Brenner, & Rainie, 2012). Access to enormous amounts of information through a single tool, however, can reduce or even direct teachers to a specific content, particularly when considering the personalized searching policy that has been applied extensively throughout the web (Pariser, 2011). On the other hand, a large percentage of the respondents (a greater number of pre-service teachers compared to that of in-service teachers and ICT teachers) only rarely uses advanced searching techniques, while almost one third of all research groups basically does not know how a search engine searches the web. At the same time, both pre-service and in-service teachers maintained they were largely satisfied with the results of their web searching. Based on their comments in the first open ended question, it becomes clear that web access is considered easy and granted. Such confidence, however, may prohibit the reflection on the web access itself, for example, what kind of access we obtain on the web, through what channels and ways we acquire it, what kind of resources we gain access to, who chooses them and why (Burbules & Callister, 2000). Therefore, if one of education's purposes is to broaden the horizons of both teachers and learners, the design and implementation of web literacy initiatives should include, for example, using and evaluating multiple search engines and metasearch engines, comparing the results of the same searches to various engines, knowing how search engines function (especially criteria of ranking the search results, e.g. Page Rank - Google), analysing their commercial nature and the ways through which they exploit "free" user searches, knowing and using alternative web content access tools (e.g. subject portals, online libraries).

A significant percentage of the participants (the primary education teachers being the smallest percentage of all groups) reported usually availing themselves of one of the web's benefits, that is reading and using various information resources on the same subject. This practice should be strengthened through educational interventions in order to ensure that web use qualitatively broadens the repertoire of information resources that teachers utilize during the education process. It should be noted, however, that the participants crosscheck information resources on the same subject via limited and specific channels, that is one search engine and simple searching.

When searching for education resources, teacher education students trust the web in general less than in-service teachers. This may be attributed to the fact that students are taught to use specific resources (university libraries and repositories, and education databases) as part of their undergraduate syllabus (Bougatzeli, Togia, & Papadimitriou, 2015). Therefore, it would be useful for future educational interventions concerning in-service teachers to also include the systematic teaching of writing a research paper and using documentation from specific databases specialized in education (e.g. ERIC^{iv}).

Considering reading practices, any future web teaching intervention should increase the frequency of consulting a website's title and index, that is structure elements which reveal information's wider context and purpose. In this way de-contextualization of information could be treated, a phenomenon that is not specific to the web, but is omnipresent in the web information publishing and using practices, where we can instantly locate and select pieces of information. It is exactly this fragmentation of web resources that intensifies their de-contextualization and their use as a consumer product.

Findings indicate that both in-service and pre-service teachers rely heavily (almost half of all groups) on other web resources in order to assess the validity and accuracy of the web resources they find. Therefore, their web literacy education and/or training may focus on the systematic analysis of web content. Towards this perspective the four different types of contents as analyzed by Burbules and Callister (2000) could be helpful. According to them, web information can be wrong or incomplete (misinformation), harmful (malinformation), so badly presented that it cannot be used (messed-up information), and information that interests very few people (mostly useless information). The challenge here is to provide teachers with experience in order for them to become able to evaluate web content by questioning the degree of its elaboration and documentation (primary, secondary, tertiary information resources) in conjunction with the identity and purpose of its providers. To achieve this aim, the *Verification Handbook* (Silverman et al., 2014), although aimed primarily at journalists, could be a good starting point for use in teacher education too.

The research findings from teachers' responses to the second open ended question (which web information do you consider useful for teaching, and why), show that both pre-service and in-service teachers highly value the web's potential as a medium where hybrid forms of multimedia and multimodal information resources dominate. Probably, because of the web's multimedia features, teachers often select their resources based on morphological elements (i.e., ease of use, appealing and interesting appearance, stable and clear organization, information given in various modes) rather than content features (i.e. various resources for the same information, regular updating, links to other resources, reliability). Therefore, every educational intervention should ensure that teachers understand that their choice of web resources should not be at the expense of content quality, otherwise the value of web use in educational settings would be questionable.

In addition, teachers' education should stress the fact that hypertext technology by which web resources are structured poses increased demands of decision-making and visual processing of young readers (Coiro, 2003, 2011; DeStefano & LeFevre, 2007). This could impair reading comprehension and teachers must be aware of it, if their purpose is to have students not only to gain more information, but to construct knowledge.

Limitations - Implications

Regarding the limitations of the research, it could be first noted that since participation was voluntary and derived from a general population, it is difficult to draw firm conclusions because the representativeness of the sample is problematic. Second, the survey is based on participants' self-reports and not on in situ observation of their practices. Consequently, the findings should be treated with caution and only as starting point for further research. For example, in situ observation could further investigate if the teachers' reported practice of crosschecking concerns morphological and/or content elements, in other words, if teachers question the information's reliability and accuracy, or whether they simply assess the multimedia/multimodal character of web information resources. Further research could also investigate more deeply the reasons for teachers' positive attitudes towards using the web in education (Table 1). Are these attitudes derived from teachers' experience concerning specific learning outcomes, or do they simply echo the common practices of both teachers and pupils when searching information?

In conclusion, the present research serves as an initial mapping of web searching, reading and evaluating practices of pre-service and in-service teachers in Greece. As noted above, it would be unsafe to interpret and make generalizations mainly because of the research's methodology limitations. Still, this initial record shows that there is room for web literacy initiatives aiming at having teachers adopt a dialectical relationship with the web (Bruce, 2000) in order to ensure: a) effective pluralism in information provision in educational settings, and b) critical evaluation and exploitation of information resources for the benefit of learners. In line with a previous study (Bougatzeli, Papadimitriou, & Douka, 2015), this research indicates that there is room for teachers to learn about quality characteristics of web information resources, such as their authenticity, origin and context.

The challenge here is to design and implement teacher education interventions that apply the approach of critical literacy to web information resources. According to this approach, teachers would not read online texts in isolation, but develop an understanding of the cultural, ideological and sociolinguistic contexts in which such texts are created and read. Moreover, they would develop an understanding of the origin and character of the web as a whole in an effort to challenge the current online status quo, discover alternative online reading paths and uncover "hidden" resources (Fabos, 2008). Towards this perspective, teaching interventions like the one recently applied in the School of Primary Education at Aristotle University of Thessaloniki could be a good starting point (Bougatzeli & Papadimitriou, 2016).

Endnotes

ⁱ Learn to think "*critiquely*" (a word coined by James Paul Gee), that is, not merely consume information but also "understand and critique systems of power and injustice in a world that [people] will see as simply economically inevitable" (Gee, 2000: 62).

ⁱⁱ ITU Statistics: <http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx>

ⁱⁱⁱ <https://learning.mozilla.org/en-US/web-literacy/>

^{iv} Education Resources Information Center, <http://eric.ed.gov/>

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