Critical search and evaluation practices of Web information resources applied by senior students in the Department of Primary Education of AUTH for the design of alternative projects in teaching language

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Abstract

The aim of the present study is to examine the ways through which potential teachers search for and evaluate Web information resources, in order to design alternative teaching activities for the cultivation of linguistic literacy to primary education students, as part of their non-formal practice in visual/multimodal literacy.

The research, in which 85 fourth year students of the Department of Primary Education at the Aristotle University of Thessaloniki participated, was conducted in two phases, the pilot phase and the main phase. During the main phase, the students were engaged in activities concerning the presentation and discussions about credibility issues of information resources in general, and the application of specific evaluation criteria of their content and usefulness, in order to initiate a critical dialogue with the Web. Data collection was accomplished through structured non-participant observation of Web information resources searching, selecting and evaluating practices, and the compilation of a questionnaire concerning the students’ Web use.
The results show that the students are based exclusively on search engines – mainly only on one – and select information resources without knowing almost anything about the political economy of the Web. As far as evaluation is concerned, the students rely mainly upon the morphological and design elements of information resources rather than on elements about the origin and credibility of their content. These findings underline the necessity for applying critical literacy practices on the Web, so as future teachers they will be able to a) understand the concept, the structure, and the function of the Web into the current dominant economic and political context, b) develop critical web searching capabilities, c) realize the need to evaluate Web information resources and learn ways to approach them critiquely.

**Keywords:** information resources, World Wide Web (Web), critical literacy on the Web, political economy on the Web

**Introduction**

In contemporary meta-industrial societies the Internet and the Web tend to become the basic channels for information, communication, interactivity and amusement, while the power of book and printed page as dominant spaces for the representation of meaning is questioned due to the rapid developments in the communication technologies and processes (Kress, 2003). Despite the fact that the Internet and the Web were not designed for children, nor were they designed to be used in educational settings (Kuiper & Volman, 2008), their use inside and outside school is rapidly increased and, therefore, they become basic elements of life and learning for young people (OECD, 2009). Research findings about Greece (Kokkevi, 2011), are consistent with those from other countries (Kokkevi, 2012) and document the continuous increase in their use by young people. Therefore, when asking to what extent the Web use can contribute to the pedagogy of literacy, the answer seems to be inextricably intertwined with the necessity of teaching first the prospective teachers to become dialectical readers of the Web and approach it critiquely\(^1\), so then, they can familiarize their pupils with various ways of exploiting it. As a result, the capability of evaluating the content credibility and usefulness of Web information resources\(^2\), becomes a crucial element of literacy nowadays (Burbules & Callister, 2000).
Conceptual framework: From information literacy to critical literacy and the political economy of media

The Internet and mainly, the Web emergence as central channels of modern information settings, due to their instant accessibility to vast amount of information resources and their attractiveness because of their visual/multimodal character, has driven many governments throughout the world – including Greece (Jimoyiannis, 2011) – to adopt policies to support their use in education. Nevertheless, the use of the Web as a new learning tool requires new capabilities and attitudes that teachers and pupils should possess so as to be able to act effectively into the rapidly changing multimedia and information technological settings.

The term information literacy involves a set of capabilities which are related with the understanding of both the topic area and the kind of information required within this topic area, as well as with the knowledge of where and how to find this information. Therefore, a person can be considered as information literate when he/she is capable of examining his/her resources and distinguishing between facts and opinions, of comparing similar resources, of identifying competing interpretations, of knowing to what extent more information is needed and of organizing ideas and information in a logical way (Breivik & Senn, 1998; Grassian & Kaplowitz, 2009, as cited in Fabos, 2008).

According to this approach, information literacy operates within a given information environment providing a first step towards analyzing information. It is, however, fairly limited in terms of reaching a more thorough understanding of the broader context of information access, since it is not aimed at developing capabilities related to criticize the information environment itself and its relation to education, by posing questions such as, Who has created these information resources and for what purposes? Thus, the Internet appears to be ideologically, politically and economically neutral, or in other words, the political, economic and social context within which the Internet is structured, is completely ignored.

On the other hand, the view of education as a political act, puts the extended concept of literacy into the foreground, and especially of critical literacy. According to this, texts are perceived as carriers of ideologies, namely they are perceived as containing a
political perspective and positioning a certain place on the political spectrum (Lankshear & McLaren, 1993; Lewis, 2001). Critical literacy is aligned in many ways with the critical pedagogy approach and the work of Brazilian educator Paulo Freire (1984, 1970/1993), since, through the analysis of institutions such as schools, media, and family, it is aimed at revealing and deconstructing the power relations, thus helping the students to obtain social awareness and work towards the empowerment of ‘marginalized’ discourses and, by extension, of democracy.

The application of the critical literacy principles in the mass media (Sholle & Denski, 1993) – critical media literacy – has resulted in focusing interest in the exposure of ideology behind the media content, and in the understanding of the political and economic context of media as cultural institutions. Critical media literacy is, perhaps, a threat to the overall current political economy, in the sense that it is often driven by the desire to change the commercialized media system and the existing political system, which uses media and advertising in order to shape political perspective and maintain existing mechanisms of power (Fabos, 2008).

The political economy of contemporary media focuses on the understanding of how the economic and political context of a social system determines and dramatically affects the formation of this system (Mosco, 1996; McChesney, 1999; Bagdikian, 2004; Fabos, 2008), and, broadly speaking, it could be defined as “understanding social change and historical transformation” (Mosco, 1986, p.27, as cited in Fabos, 2008, p.842). In this light, the information and communication media form a part of the economic system, in the sense that they ‘sell’ content of mass culture and are directly related to the policy making and, therefore, to the political interests. This means that media analysis refers, on the one hand, to their ownership status, that is, who controls the media – and, therefore, holds the power – and, on the other hand, to the ways the forces of communication market operate, which undoubtedly operate in terms of profit.

In light of the political economy of media, the Internet and the Web are not neutral, coming from nowhere, without belonging to anyone, but they are perceived as an environment where interests and power relations are growing between individuals, groups, organizations and companies, promoting an ideology which is to the interest
of their creators/owners. Consequently, a set of issues related to access to information, that is, what kind of access or access to what information, content control, privatization of social discourse, and future of the Internet as an educational and democratic means, are being raised (Fabos, 2008). As a result, it is considered necessary to examine or, more precisely, to re-examine issues related to what constitutes content, who controls the content, how much the content costs, how that content can serve education (Burbules & Callister, 2000; Fabos, 2008).

Accordingly, teachers and pupils must have at their disposal a set of abilities that will enable them to ‘manage’ the issue of critical understanding – not only of the evaluation – of the total range of competing political ideas and of the ideological framework of the Internet and the Web. In other words, if our aim is to utilize the Web as an educational tool, then the need for the development of skills related to the evaluation of the Web as a whole and the understanding that all the ‘discourses’ are inherently ideological – that all ‘texts’, including the complex multimodal/multisemiotic resources of meaning on the Web, are built on political and economic foundations – is of particular importance in order for young people to be able to face the rapidly changing realities of their working lives, their public lives, and their private lives.

**Research purpose and questions**
The present study aims to empirically investigate the search and evaluation practices of Web information resources by students during the broader process of understanding and giving meaning to the world on their part as social actors. Specifically, this study attempts to answer two basic questions: (a) How do the senior students of a Primary Education Department, and, therefore, prospective teachers, search and locate Web information resources? (b) How do they evaluate the Web resources they identify in order to design alternative activities for teaching language and, by extension, for the cultivation of literacy to primary education students, in the context of their informal practice in visual/multimodal literacy?

The ultimate aim was to investigate the existence or not of critical literacy practices, that is, whether the students perceive the Web information as given or challenge it and try to see ‘behind the screen’, by posing questions such as:
✓ Why does this information exist/ what is its purpose?
✓ Whose interests does this information serve/undermine?
✓ How does Web searching function/ how does a website function?
✓ Could it work differently and how? (Baynham, 1995, p.2).

Methodology
This study follows the ethnographic approach of the social sciences, particularly science education, while it is also a case study.

Participants
The participants in this study were eighty-five senior students of the Department of Primary Education at the Aristotle University of Thessaloniki, who during the 2014 spring semester were attending the compulsory elective module, *Multimodal discourse teaching practices*. Out of the total number of students, 77 were women and 8 men, aged 25 years, and only two are aged 26 to 30 years.

Data collection techniques
Research data were consisted of: (a) recording students’ practices when they seek and evaluate Web information resources, (b) questionnaires investigating students’ attitudes towards the Web which they were asked to complete individually, and (c) presentations of websites by the groups of students as well as the discussions that took place within and between groups and focused on web content credibility issues.

The recording of practices was conducted via structured observation. To avoid the risk of affecting the results, researchers were not involved in the observation (non-participant observation). Observers came from the students, were selected randomly and were two per group, in order to increase the validity by comparing two reports for each observation. However, the possibility of some degree of unusual behaviour because the participants knew that their practices were recorded, cannot be excluded. To mitigate this risk, the completion of an anonymous questionnaire at the end of the first workshop, was chosen.

The data processing was based on the framework suggested by Wolcott (1994) for the description, analysis and interpretation in qualitative research. According to this and
in relation to the specific research questions, description sought to answer “what happens during searching and evaluating Web information resources”, analysis sought to answer “how the various search and evaluation practices of Web information resources are interconnected”, while interpretation sought to answer “what do search and evaluation practices of Web information resources mean”.

Research design

The research was conducted in two phases; the pilot phase (December 2013), during which the data collection tools were designed and tested, and the main phase (March 2014). As far as the design of data collection tools (observation form, questionnaires) is concerned, the researchers took into account the international bibliography (Hirata & Hirata, 2010; Rains & Karmikel, 2009; Pariera, 2009; Wu & Tsai, 2005), but they focused mainly on attempting to examine empirically the search and evaluation practices of Web information resources in the light of critical literacy.

The main research was conducted in a computer lab during two three-hour workshops. The students worked in 19 groups of their own free will; each group consisted of 3 to 5 people.

Students were given a list of six sections from the Primary Education Language textbooks (4th, 5th and 6th grade). They could choose a subsection from any section they wished, and they were asked to design a teaching activity drawing Web information resources, with a choice of up to three resources.

One hour before the observation, the observers were given the form that they would complete and clarifications on it. Although the form contained the points of interest that the researchers wanted to examine, it was clearly asked from the observers to use the form as an auxiliary tool and to feel free to supplement whatever they considered worth recording. Thus, the researchers sought a balance between the imperious obligation to remain open to new evidence and the practical need to formulate a guide for observation, according to the research design.

During the second workshop, the researchers recorded points from the presentations of websites that the students’ groups had selected (one per group) and the discussion
that followed. Then each student completed one anonymous questionnaire with four open questions concerning the website www.youtube.com. The choice of this site was not accidental, but arose from the fact that it was chosen by all groups for the design of teaching activities. The questions revolved around the description of YouTube, its purposes, its authors/creators and recommendations for improving YouTube.

The fact that the research was conducted in the context of a module workshop may have influenced students’ behaviour. However, the researchers believe that key features relating to attitudes, perceptions and habits in searching and evaluating Web resources, were not significantly affected.

**Results**

The results presented below reveal first, students’ attitudes towards the Web, secondly, their practices when searching Web information resources, thirdly, their practices when reading and evaluating these resources, and, fourthly, their critical evaluation of YouTube website.

**Attitudes towards the Web**

The processing of students' responses to the first questionnaire, shows that they were absolutely positively disposed towards the Web, since, as they claimed, they used it at least once daily for information and entertainment. Almost half of them stated that one third of their Web time spent on information and conversation concerning educational issues. The students believed (in order of popularity) that both primary education pupils and teachers can utilize the Web in order to (Figure 1):

![Figure 1: Summary of Web use purposes](image)
The students stressed the lack of, or in some cases, even the absence of adequate technical infrastructure and/or human resources (e.g. ICT\textsuperscript{3} laboratory, equipment such as projector and/or interactive whiteboards, ICT personnel), in the schools where they were placed for their teaching practice. It should be noted, that these schools are mainly located in the central urban area of Thessaloniki and their pupil population consists largely of children with native language other than Greek. During discussions with the teaching personnel, the students reported that the teachers of these schools expressed reduced expectations –characteristically they said they would be happy if these children could read and write after completing primary education. This fact refers to earlier times and to the absolutely essentials of the classical concept of linguistic literacy. On the other hand, the students recognized the need to be able to find the right Web resources first and, then, to get their pupils to know ways to use the Web more effectively, since “the Web is already something given in pupils' life outside the school” and “many children acquire negative experiences from their exposure on the Internet”.

\textit{Web searching practices}

Before we proceed to the presentation of the students’ web searching practices, it is worth noting that, during the first workshop, all groups spent on average 38 minutes each to complete their task, that is to search and choose up to three Web information resources for the design of an educational activity.

From data analysis of the first questionnaire, it is evident that students considered it as ‘natural’ to obtain access to vast amounts of information through search engines, which they trusted as ‘unique gates’ to information resources, while they ignored the consequences of:

- the commercial nature of the most popular search engines,
- the ways through which search engines exploit the "free" user searches for their own purposes,
- the operation of search engines, and in particular the criteria according to which their lists of results are structured.
The recording of students’ behavior when searching Web information resources for completing their work showed that the vast majority (97%) searched the Web through only one search engine, that of Google's company, while they did not use other search engines, because they even ignored their existence. Consequently, they were unable to compare between search engines both which resources these search engines have access to, and the ways in which the information resources appear in their list of results. When asked about the ways they use to locate information in the Web, the students replied in the most obvious for them way “But, of course, we will google it”.

Although all groups – except one – used only the simple search of the search engine of Google, one third of the respondents stated that they both know and usually or always utilize complex Web searching techniques.

Additionally, most teams returned to the first page of results and then chose something else every time they considered that the identified resource was not appropriate to their purposes. The initial page of the results of the search engine remained the sole guide for the students during the whole process, while many of them did not know (Figure 2):

![Diagram](image)

Figure 2: Summary of search practices due to inappropriateness of the initial Web information resources

Also, almost all students did not know how to decode the address of Web information resources (url), a practice of critical analysis that can reveal much about the purpose and the reason of existence of each resource. Characteristically, when the students were asked about the url of Google (www.google.com/www.google.gr), first they answered that com means community, and then, with a little help from researchers,
At the same time, the vast majority (94%) of the students considered their searches as successful, because “I always find something relevant to what I'm looking for”. Very few students (only 6%) felt that they failed in their search, because of the:

- complexity of their topic (e.g. bibliography about learning disabilities, Down, Rett, Williams syndromes),
- way of their Web searching.

**Web reading and evaluating practices**

When reading the Web, the students stated that they usually (Figure 3):

![Figure 3: Summary of the Web reading practices](image)

As regards the ways in which students evaluate Web information resources, they stated that they usually do so by (Figure 4):

![Figure 4: Summary of the evaluation practices of Web information resources](image)
Of particular interest is that the students reported that they usually trust the information and, therefore, they do not make any kind of evaluation, when information comes from (Figure 5):

![Figure 5: Summary of practices for evaluating reliability/validity of Web information resources](image)

The students said that they evaluate as useful the Web information resources, if (Figure 6):

![Figure 6: Summary of Web information resources’ evaluation criteria](image)

Only 1 in 5 students connected the Web information usefulness with issues such as:

- origin,
- language (Greek),
- the news/current events,
- multilateral/global awareness,
- the Google's blogger service,
alignment with supported learning/teaching theories (e.g. “When the information is matched with the learning theories and pedagogies that I support”).

The case of YouTube

With respect to the first question, concerning the description of the site, it is worth noting that although description was requested, one third of the answers concerned its evaluation, which in its majority was positive. Indicative answers were phrases such as, “It provides knowledge”, “We are informed of developments through vivid images, so it is highly reliable”. This practice, most probably was due to the high popularity of the website since the students were likely not to sense the need to describe a website considered as granted and used by everyone.

As a consequence, during the categorization of the responses arose two major subcategories, the description and evaluation. Subcategory, description joined the answers which related, on their entirety, to the description/presentation of the site either as to its format or to its content, whereas subcategory, evaluation joined the answers which somehow characterized the site. From the data of figure 7, it is evident that there were very few participants who described the format of the website, while most of them focused on its content, speaking either about the purpose of it, or about the multimodality/visualization of the information provided, or about the range that it occupies. It is worth mentioning that multimodality and, especially, the existence of video, was highly appreciated by the students, because they believed that through the visualization, the information is converted to "more understandable and enjoyable for the children." With respect to the range, this referred both to the plethora of information, which was translated into a broad coverage of topics, and to the fact that the site can be updated by each user and it is addressed to each user. The range of the site was evaluated basically positively, since only one student noted that, “This website is unreliable as anyone can upload whatever he/she wants”. Also, there were answers which, simply, were characterizing YouTube and they were not related neither to the format nor to the validity and reliability of it (e.g., “interesting”, “useful”, “entertaining”, “amusing”, “practical”, “helpful/beneficial” and “[...] pleasant to use by children. The information provided is clear, understandable, enjoyable and easy to read [...] “).
With respect to the second question, which focused on the purpose for the creation of the specific website, the vast majority of students (4 to 5) believed that this was created for information/updating, entertainment/amusement, or communication/interaction (Figure 8). It is characteristic that almost none of the students sought documentation of information when using the website, ignoring that the information disseminated via this website is not always documented. Indicative of this students’ attitude towards YouTube, was the answer according to which the site was created “for users to share their knowledge, experiences and ideas”.

Only one in five students stated that this website was created in order to promote interests. Characteristically it was noted: “I think that the purpose of its creation is commercial and political and helps for promoting interests. Users, however, utilize youtube sometimes thoughtlessly, not knowing or ignoring the interests”. In general, most students (4 to 5) did not realize the economic and political context of this platform, noting that, “The site was originally created randomly”, “for the needs of all people” and “I do not think that it was created for a particular purpose because people upload the videos”.

Figure 7: Summary of the responses related to the description of YouTube
As far as the third question is concerned, which was relevant to whether and why the participants would like to be one of the creators of YouTube, a large percentage of students’ responses—such as, “Anyone could be the creator of a website like this”, “Anyone can create his/her own channel and upload a video”, “Of course, because I deal a lot with this site”—revealed that the students did not understand the discrimination between the ‘provider’ and the ‘administrator’ of (the material of) the site. In particular, 4 out of 10 respondents/surveyed stated that they could be the creators of YouTube, arguing on the basis of: (a) the recognition of the value of the site (69%) and, therefore, adopting a positive attitude towards it (e.g., “I could be one of the creators. The existence of YouTube is particularly important for people of any age, any ethnicity and cultural background and any profession, offering a huge variety of all kinds of video presentation”), (b) the fact that they already communicate material on the website (23%), (c) the critical evaluation that, in their opinion, the material uploaded on the website is subjected (5%) (e.g., “[...] the videos uploaded are reliable and valid. Otherwise, the videos are downloaded and marked as inappropriate/unfit with respect to the particular topic or strange/odd”), as well as on the basis of personal interests (3%) (e.g., “It is the best, perhaps the only way to earn money”). In contrast, 6 out of 10 answered that they could not be the creators of the site due to lack of technical knowledge (39%) or self-confidence (19%), competing ideologies (19%), lack of interest (17%), or economic burden (4%). It is worth focusing mainly on answers about ideology, in the sense that answers like these reveal nuggets of critical literacy. However, unfortunately, only the 19% of the respondents who stated that they could not be themselves the creators of the site gave answers of
this kind. Indicatively only two of them mentioned: “No, since .com (company)” and “[…] I consider that the particular site is supported by ‘important’ businessmen in order to promote any ads and videos they wish”.

Finally, with respect to the fourth question, through which the students were invited to make their suggestions/recommendations about the improvement of YouTube, only 1 in 10 said that he/she would not make any adjustment/change/modification to the site, arguing/justifying that “I think that (the site) does not need any improvement”. Nevertheless, 9 out of 10 suggested interesting improvements to the site, from which, however, only a small percentage (22%) was related to education. In particular, the improvements proposed, by order of preference, can be summarized on the following:

- **Creating filters of (54%)**:
  - Validation/reliability (e.g., “The material uploaded on the website to be checked with more consciousness – on the part of whom uploads this material – and to be presented more clearly why and who uploads it”).
  - Protection [e.g., “Videos with obscene, violent, offensive content should not be displayed, especially when you visit the site without your choice and rights must be protected, because some people upload videos with persons who are not aware of this fact and they are exposed”].
  - Search/better categorization of content (e.g., “Specific categories for easy finding information must be established”).

- **Education (22%)** (e.g., “I would recommend more videos with educational content and teachers’ comments”, “The videos addressed to educators so that they can be used as educational material, should be controlled by an administrator who will judge the free distribution or not of this material at schools” and “To become more suitable for children”).
  - Create an exclusively education Web channel
  - consolidation of content
    - In general
    - In Greek

- **Block** (and not limitation through filters, as indicated in the first category) obscene, violent or offensive content (8%).

- **Reduce commercialization through advertising (5%)**.
Administration of comments to improve and enrich the material (4%).
Place more information (3%).
Technical issues (3%).

To summarize, although prospective teachers seemed to appear a very positive attitude towards the particular site, which is demonstrated through their answers to the first three questions, the plethora and the kind of the proposals presented in the last question showed that they expect from YouTube to be converted to a completely different site in terms of the purpose, form and content.

Discussion
From the preceding qualitative analysis of data, it is clear that the students' attitude towards the Web is generally positive. The arising question, however, is as to whether this positive attitude, is an attitude that criticizes the Web, as well.

Search engines are the primary/unique tool with which students navigate and access the Web content. In particular, only one search engine, the search engine of Google company, seems inextricably connected with the students' Web searching practices. This almost complete connectedness is also recorded by another research, in which students are unable to provide specific answers when asked about where they learned about Google, and characteristically say “I feel like Google was just, was always there” (Olsen & Diekema, 2012, p.5).

The students used the search engine of Google company even when they knew from the beginning which site they would visit, and did not write directly its address or did not consult a thematic index or portal. It could be argued that it is not necessary, nor easy to memorize addresses of websites and that in our personal devices we may use our own address book of websites, something that is not the case in shared devices. The students, however, justified their clear preference in the search engine of Google company, because it is “easy, fast and always gives some results”, and at this point there was unanimity, so we can assume that this is their dominant way to search the Web. Comfort and digital visibility become decisive factors in the modern landscape of information (Rowlands & Fieldhouse, 2007). But these two factors are ‘earned’ for
users primarily through a commercial environment, about which they have no knowledge neither about its purpose and methods of operation, nor about its evolution and the fact that is dominated by companies with priorities other than the original ones.

The data is consistent with corresponding reports of the last fifteen years. In the U.S.A., periodic polls show that the use of search engines is one of the most popular activities online. In 2002, 52% of adults had used search engines, and a decade later, in 2012, this percentage rose to 73%. At the same time, the frequency of use of search engines was also increased dramatically. In addition, users are satisfied more than ever on the quality of their search results and show a high degree of trust in the capabilities of search engines (http://www.pewinternet.org/2012/03/09/search-engine-use-2012/). Especially for students, the use of search engines is recorded as their dominant strategy when searching for information, already since 2005 (Griffiths & Brophy, 2005).

This apparent replacement of libraries and information centres, which are mostly public institutions, with search engines of mainly commercial corporations, as meeting places with information resources, raises serious questions about the use of the Web in education. The students of today are the so-called ‘Internet generation’, or, ‘Google generation’—those born since the early 1990s, and have not known a world without the immediate availability of online digital information (Tapscott, 2009). They are based almost exclusively on Google in order to find information, and this practice determines how they face and interact with the content of information resources. On the other hand, the production of the Web content by ordinary users, not only by publishers and official bodies, grows at unprecedented speed via blogs, wikis, personal websites etc. As it is characteristically noted, "library-sponsored content is shrinking in relative terms and it will become more difficult to find as users land where the search engines take them, not where librarians think they "ought" to land" (Rowlands et al., 2008, p.14). In the past we used to say that "a book is a window to the world", now it is time to begin to wonder whether a company, especially a multinational one like Google, is the sole window to the world of the Web and what impact has its almost monopolistic position into the current information flow particularly with regards to education (Fabos, 2008).
The students think that they know complex search techniques, because they use more than one word when searching. But even this is done in a non-structured way, because the students do not elaborate from the beginning, the concepts and topics for which they seek information. Exactly because they can instantly locate some resources related to their purpose, but not necessarily the best ones, the students do not progress in reflection on the character of these results or on their searching process itself in order to proceed to some changes in the search strategy. For example, the groups who searched resources for the unit with the title “Indigenous Peoples”, put the full text of the section title – without quotation marks, because they did not know their function – in the simple search bar of Google, hit enter, and began to scan the first page of results. Alternative strategies – except for the use of quotation marks – would be to add the type of source they were seeking (e.g., ‘educational material’), to use synonyms (e.g., natives), after first clarify the search terms, etc. As it is shown in other studies too (Head & Eisenberg, 2009), there is a strong need for students to understand the framework within which they seek resources, notably the conceptual definition of their subject and the corresponding terminology, so then they can perform more targeted searches.

The complete dependence on results list of Google is deteriorated by the fact that students choose to look further, usually the resources in the first positions of the list by reading their description there. But this list of results is structured according to commercial criteria, and the students must learn that the range of resources has nothing to do with their quality, even with their popularity. Instead, the display order of results - especially in the first few pages – is subject to changes based on commercial and financial criteria, and reflects the prevailing discourses and forces within a given economic-political system (Fabos, 2004).

On the other hand, the prevailing sense that through a single environment, I can search everything, obscures the various resources of information (books, articles, studies, theses, teaching materials) and thus leads to a leveling homogenization. However, the diversity of resources is closely connected with both the process and the content of the information, and especially with the purposes it serves. The observation made clear that the students don’t know about the ways information is being
generated, organized and disseminated nowadays. Any attempt to make them more critical towards the information resources they find in the Web, should first clarify to them the information flow itself with regards to current information technology developments. The UNISIST model of a World Science Information System and its proposed revision offers a good starting point towards the study of different forces and agents that are involving in the information production, organization and dissemination (UNISIST, 1971; Søndergaard, Andersen & Hjørland, 2003).

The students’ Web searching presents the characteristics of behaviour through which resources that contain enough information, but not necessarily the best available ones are instantly selected (just enough information is good enough). No group exhausted all available time (60 minutes), although the researchers informed the students from the beginning that they even could overcome this time, if they considered it necessary. Previous studies (Johnson, Griffiths, & Hartley, 2001) also show that the levels of satisfaction with the search engine use are associated more with efficiency, and that users often prefer practices that demand the minimum of effort and time. This perhaps indicates that the time and effort required on the user part, are valued as more important than the relevance of the resources which are found. Although the challenge is to search the Web rationally, which means that we should be able to judge clearly why we make certain choices, this do not appear to be involved in students’ searching.

As documented in other studies too, the students are generally satisfied with the results of their searches in the Web, and evaluate their web searching abilities high. In the meantime, however, a significant mismatch between their ratings and the actual quality of their work is recorded (Buschman & Warner, 2005). Both the observation and the recording when the students presented websites, showed that the percentage of those who read and understand information such as subject, title, index of a site, that is information about the structure of a website that reveals its content and purpose, is actually much smaller than it is stated by the students themselves. Instead, scanning to locate preselected words or phrases appears to be the main reading practice, both when reading the results of a search, and when reading in a website. Still, we pay a price for the sacrifice of depth, when we scan extensively, instead of reading intensively (Birkerts, 1994).
The students evaluate the Web information resources mainly by comparing them with other resources in the Web. Still, this comparison is based almost entirely on morphological and design elements. The students do not crosscheck and validate the information presented with the intention to question its reliability and even more, the emergence of different ideologies that this information possesses. Students, for example, choose multisemiotic/multimodal information resources –especially video, on the basis of the age of their audience (the young children) and of their teaching objectives.

✓ They do not compare how the same topic is presented in various websites based on the identity and purpose of website creators. (No group searched deliberately the identity of website creators/providers/sponsors etc.)

✓ They do not question the extent of information processing (primary/secondary/tertiary resources of information).

On the other hand, discussions with experts, concern only a small percentage of information evaluation. These findings support the need to increase cooperation with teachers and information professionals in assessing the Web information resources, so that the students by being aware of the range of different views and the variety of different perspectives to be able to construct their own meaning during the learning process (Head & Eisenberg, 2009).

In almost no case, the students concern about who creates the information and which are his/her purposes. Instead, the students assume as given the information accuracy and validity, when this information is posted:

✓ In educators’ blogs. Still, they do not investigate further details about author’s identity, they assume he/she is a teacher from the context. Also, they do not seek information about the setting in which the proposed activity takes place, its outcomes to pupils’ learning process, etc.

✓ In the official website of the Greek Ministry of Education. All groups trust this website and choose to navigate the Web via its links. Yet, they do not realize that the way the information is presented there and whether or not there are links in specific points and to specific resources, reflect the official educational policy.
In websites of organizations such as Unicef, National Geographic, etc. Here, the students assume that “information is reliable, because the agencies are reliable” and they do not investigate the operational context of these organizations and their history, purposes and policies.

Absence to investigate the website creator/sponsor and its aims, means that the students choose information for their work based not on name, status and purpose (commercial, public, educational, etc.) of website creators, but on morphological elements (mostly images and videos) that can serve their goal as educators to engage children's interest. Characteristically in the case of www.youtube.com, even when they were asked about its goals, no one sought, nor read the section “About YouTube” in the official website. The students seem unable to realize the extent to which the author shapes the meaning and the messages mainly in the visual communication modes (e.g., by silencing alternatives, by posing filtered or implied views, by focusing on specific ideas, etc.).

The students’ decision-making seems to endorse the theory of bounded rationality and the use of a simplifying mechanism by which we choose results that we consider sufficiently good according to our purposes, but not necessarily the optimal ones (Simon, 1976). The overwhelming majority of the students arrive in sufficiently good results, "sacrificing" the best, however. Almost all groups tend to scan fast and usually, to judge from the information given in the list of the results only those that appeared in the first few positions, before deciding whether or not to perform new searches, or "look further" a resource by clicking on its link. Not a single group has examined in detail all results even from the first page. Such behaviour agrees with similar behaviour of pupils (Bilal, 1998). One can conclude that this is the most applicable practice when searching the Web, where we have to manage prohibitively huge amounts of information. However, if with our actions, we focus only on what the search engine is proposing to us on the top of a list, then it is necessary to realize that the issue of access has a significant impact on our information. Through which channels and how this access takes place and what sort of information resources concerns, these are important questions that deserve to be conceptualized by the prospective teachers, if we really want to exploit the potential of the Web in education (Burbules & Calister, 2000).
The sense that the access to the Web is easy and given, hinders critical reflection and questioning not only the nature of this access itself, but also the way in which the Web itself is constructed and operates. The ease of access and the immediate availability of an abundance of resources, conceals the fact that the really useful information becomes increasingly more difficult identifiable, just because of the way information is organized - or rather disorganized, on the Web. With the hypertext / hypermedia, resources in various formats (text, image, sound, movement) are linked together and allow non-linear reading and the creation of various reading paths on the part of users, surpassing the limitations of print media. Thus, both the creation and dissemination of complex information resources are facilitated, and it becomes possible to access them according to the order, quantity and form that the users choose each time (Landow, 1992). Hypermedia technology is a reality, but it is important to know that it can release its potential under certain conditions. How educational are the hypermedia through which the students and the pupils navigate, who decides what, how and when to read in a rich information environment, such as the Web? (Charney, 2001)

In practice, hypermedia technology has exceeded the scientific and educational communities. Each resource in the Web can be linked and is connected with other resources via hyperlinks in an endless way. Such links associate any item with any other item for any reason that happens to occur to whoever is making the link, without limitations of older systems of classification and authority systems. Thus, the user navigates directly from one resource to another, provided that there is a link between them, and has immediate access to a vast network of information that all is equally accessible and at the same level. As Dreyfus (2009, p.11) states:

The whole of the Web lies only a few links away from any page, … hyperlinks have not been introduced because they are more useful for retrieving relevant information than the old systematic ordering. Rather, they are the natural way to use the speed and processing power of computers to relate a vast amount of information without needing to understand it or impose any authoritarian or even generally accepted structure on it. But, when everything can be linked to everything else without regard for purpose or meaning, the vast size of the Web and the arbitrariness of the links made it extremely difficult for people desiring specific information to find the information they seek. Although information retrieval techniques are constantly being improved through the proliferation of the algorithms of search engines, we have to remember and make
clear to the students that this is done into the context of a commercialized environment and mainly for the benefit of the dominant economic and political forces.

There is no doubt that in the Web we can quickly locate and select **chunks** of information. This is the analog that a consumer experiences in a shopping centre, the sense that we can directly satisfy all our consumption needs, selecting products and services. The fragmentation of information in the Web increases its decontextualization and its use as a consumer product. It is a questionable issue whether the students are able to distinguish which elements are rumours, or even information disseminated deliberately with the aim to hurt. It is vital to search for and question the origin of any web information resource, but not with a purpose to establish the one and single truth, because there is no neutral information. Instead, the information always reflects its economic and social origin, and the prevailing decontextualization in the Web obscures exactly the political economy of information.

As Burbules & Callister (2000, p.4) note,

> information is always cooked (as opposed to raw): it is always selected, filtered, interpreted, and extracted from a background set of assumptions that are implicit (rarely explicit) in the" information "itself. This does not make the information false, or worthless; but it is in no way "given", even for the most widely accepted and obvious of "facts".

Perhaps the most important, especially for educators, is to start realizing the long-term consequences that the Web use bears on how we conceptualize, seek, evaluate and use information. The speed of access, the fragmentation and the decontextualization of Web information, reinforce a strong tendency towards shallow, horizontal, "flicking" behaviour in digital environments. Users of all ages prefer quick information in the form of easily digested chunks, rather than full text, and the findings of the present study confirm it once more. It is questionable whether the use of Web information enhances our exposure to alternative ideas and opinions, thus expanding the awareness of our social world, or conversely, we are limited to silence the prevailing views of the dominant ideology. As it is characteristically noted, "all of us are information consumers now" and "society is dumping down" (Rowlands et al, 2008, Naughton, 2008). But who really benefits from this development and what are its consequences for education, if the main educational objective is to expose learners to a variety of opinions and ideas, not only to record events?
In conclusion, results of this research may concern the general population of senior teacher education students in Greece, who are interested in exploiting the Web information resources in the teaching process. Still, issues related to prospective teachers’ Web searching behaviours and critical understanding of the ideological framework within which the Web is structured, need further research. The fact that the students were particularly interested in learning alternative ways to access and use the Web resources is very optimistic. Perhaps it is time to design and implement instructional interventions aimed at clarifying questions about the nature of the Web access and the channels through which we acquire this access, in order to deconstruct critically the 'open' and 'free' access to the Web, and to understand the function of the Web as a whole, and ultimately, the very nature of the information itself (Fabos, 2004, 2008). Expanding the notion of literacy from Freire's "reading the word, reading the world" to reading the Web, reading the world, or at least part of it, and starting to uncover the various layers of Web information, seems a meaningful challenge of education nowadays.

References


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Notes

1 learn to think “critically” (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, p.62).

2 "... resources ... are [one of ] the basic ingredients of the Web [and] may be anything that can be linked to or spoken of; many resources are purely information, but others not. Furthermore, not all resources are on the Web, in that they may be identifiable from the Web, but may not be retrievable from it. Those resources which are essentially information, and which can therefore be rendered without abstraction and characterised completely in a message are called information resources” (Berners-Lee et al., 2006, p.8).

3 Information and Communication Technologies

4 “Founded in February 2005, YouTube allows billions of people to discover, watch and share originally-created videos. YouTube provides a forum for people to connect, inform, and inspire others across the globe and acts as a distribution platform for original content creators and advertisers large and small” (http://www.youtube.com/yt/about/).