

# Students' Attitudes and Perceptions Toward the Web Credibility of "Youth 2004" in Greek Australian Schools: The Development of a Psychometric Questionnaire

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## Abstract

The purpose of this study was to develop a psychometric questionnaire in order to evaluate the educational web site "Youth 2004" considering the attitudes and the perceptions of Greek Australian students. In addition, the differences among the age and sex were also investigated. Participants were 317 Greek Australian students, between the ages from 12-17 years old. Data was collected using an on-line survey. Results from the factor analysis yielded five factors accounting for 69.5% of the variance. Independent-samples *t* test analysis revealed significant differences between the two age groups, in the case of four factors: "suitable for audience", "appropriateness of information's web format", "easy to direct and be oriented" and "interaction and feedback". In the four factors above the younger children reported better results. In conclusion the student feedback from the questionnaires indicated a general level of satisfaction and contentment with this particular web site. The scale developed in the present study can be a useful tool for the evaluation of other relative web sites by web developers.

KEY WORDS: WORLD WIDE WEB; CREDIBILITY; ATTITUDE; PERCEPTION; AGE DIFFERENCES; GENDER; TECHNOLOGY.

## Introduction

The Internet has, in recent years, experienced a tremendous explosion in mainstream acceptance and popularity, due, in large part, to the increased use of the electronic mail (e-mail) and the World Wide Web (WWW), two communication methods mainly supported by this medium (Caskey and Delpy, 1999).

NUA (2002), the authoritative online source for information on Internet demographics and trends, estimated that on September 2002, the total number of the online population worldwide was 605.60 million. Another survey from Pastore (2003) reported that the main reasons that teenagers go online are: to send/receive an e-mail (83%), to get information/research (68%), to play games (51%), to use chat rooms (40%), to download music/videos (38%), to send an electronic greeting card (31%), to shop (26%), to read news/sport (23%) and other (19%).

The same survey revealed what younger kids, aged from 8 to 12, prefer to do online: play games (80%), send e-mails (72%), use chat/message boards (58%), make their schoolwork (54%), download music (42%), shop (22%) and enter contests (18%).

One can understand from the above that the Internet is a powerful tool that can be used for training, research, business or amusement. The colorful and visually engaging appearance, rich resources, online audio and other interactive features, combine to make the Web an enormously valuable learning tool, enriched with numerous pedagogic possibilities (Oliva and Pollastrini, 1995; Owston, 1997; Peterson, 1997).

Unfortunately, not all demographic groups have participated in this information revolution. Worldwide, Internet users are more likely to be male, wealthier, better educated, and younger than the general population (Graphics, Visualization, and Usability Center, 1997; National Telecommunications and Information Administration, 2000; Tapscott, 1998).

According to Kraut, Scherlis, Mukhopadhyay, Manning, & Kiesler, (1996) gender and generation were strong predictors of Internet use; males and teenagers were more likely to use the Internet than females and adults. Male teenagers were by far the heaviest users, spending more than ten times the amount of time than the least frequent users.

Research in the United States has found that boys and girls do not differ in having any computer experience or using the computer at home or school, but by the age of seven, boys outscore girls in computer aptitude (National Telecommunications and Information Administration, 2000; U.S. Census Bureau, 1997). Very little differences existed between boys and girls in the level of use of school computers. Boys were more likely to play computer games than girls. However, girls used more frequently the household computer for word processing than boys did (U.S. Census Bureau, 1997).

Among adults in the United States, the pattern was similar. Males used the computer more than females when work-related word processing and bookkeeping were excluded. Males were more likely than females to own and used a computer at home, to use more computer programs, and to use computers as entertainment (U.S. Census Bureau, 1997). Compared to females, males of all ages were more adept at activities such as programming and more technologically sophisticated with computers (Tapscott, 1998; U.S. Census Bureau, 1997).

Given the impact of the World Wide Web and the possibilities that it opens as information and learning tool, there is an increasing need for quality management. However, the quality of Internet resources varies tremendously, thus criteria are needed for their evaluation (Valenti, Cucchiarelli, & Panti, 2001). Seven of the most important criteria are: graphic and multimedia design, browsability and organization, currency, content (in general), authority, workability (in general) and audience (Alastair, 1997). Web page evaluation procedure includes three (3) steps: a) identify type of page, b) use appropriate checklist and c) based on checklist criteria, determine relative quality of page. Web evaluation techniques are just beginning to get developed. Technology is outpacing the ability to create standards and guidelines. Establishing evaluation procedures will be an ongoing evolutionary process (Alexander, & Tate, 1998).

Whereas, the issue of the credibility of Web based information is extremely important when it is considered as a source of information for students in educational contexts, it is remarkable how few quantitative studies exist. Although some private companies have created proprietary knowledge about designing for maximum Web credibility, only a handful of studies in this area are public. In other words, little research has been published on why

people believe information on some Web sites but not others. The term, credibility can be defined as believability. A resource that is credible is one which shows evidence of authenticity, reliability and believability (Harris, 1997). Basically, the key to credibility is trust; how well can one trust the information found on the Internet, as well as other resources?

Some recent researches have examined factors that affect trust in certain types of Web sites, such as e-commerce sites (Olson and Olson, 2000) or personal sites (Flanagin and Metzger, 2003). Other studies have looked into credibility but in ways too limited to draw robust conclusions (Kim and Moon, 1998). Drawing from small studies, researchers have suggested means of evaluating the quality of Web information (Wilkinson, Bennett, & Oliver, 1997), while Web site consultants have proposed ways to make Web sites more credible (Nielsen, 1999). However, no large study that investigates and outlines the factors which influence the perceived credibility of Web sites has been published yet.

Therefore, more research needs to be conducted into learners' perceptions toward this new technology, so that specific guidelines for its successful implementation can be provided (Yang, 2001).

The purpose of this study was to develop a psychometric questionnaire in order to evaluate the educational web site "Youth 2004" considering the attitudes and the perceptions of Greek Australian students. In addition, the differences among the age and sex of the participants were also investigated. More specifically, the study was conducted to explore the following three research questions:

1. Is there a single dimension or are multiple dimensions underlying the 24 attitude items toward the educational web site?
2. Does the average amount of students' attitude and perception differ between boys and girls?
3. Does the average amount of students' attitude and perception differ between kids aged from 15-17 years old and children aged from 12-14 years old?

## **Methods**

### ***Participants***

Three hundred and seventeen ( $n=317$ ) Greek Australian students of Sydney, between the ages from 12-17 years old ( $M=14.73$ ,  $S.D. =2.91$ ) participated in this study. The participants consisted of one hundred twenty (38%) middle school students and one hundred ninety seven (62%) high school students. One hundred sixty nine (53%) of the participants were boys and one hundred forty eight were girls (47%). Students were asked to participate in this study as part of their overall computer class instruction, but participation was optional. Students who chose to participate were given a CD-ROM of "Youth 2004" and other memorabilia of ATHENS 2004.

### ***Instrumentation***

#### *Software Instrument*

The educational web site "Youth 2004" was developed by the researchers to support the Olympic education program of the Organizing Committee for the Olympic Games ATHENS

2004. The material was programmed using a hypertext mark-up language (HTML) editor, Macromedia Dreamweaver. The site was run under Web browsers such as Microsoft Internet Explorer or Netscape Navigator and was divided into seven theme groupings:

1. the Games: their staging in 2004 and the contributing factors
2. the World: the city of Athens and the countries participating in the games
3. the Heritage: a historic review of the games, past an present
4. Willpower: the Paralympic games and their history
5. Playground: “Olympic” games for young and older friends of the Olympic games
6. Library: the Olympic education program of ATHENS 2004 and the activities of schools
7. Club 2k4: a channel of communication for the friends of “Youth 2004”.

In order to cover a wide range of information on the past, present and future of the Olympic and Paralympic games, “Youth 2004” included the use of a simple language, a host of interactive applications such as audio flash movies and video, a wealth of photographic and other illustrative material and numerous high quality games.

The educational site was addressed mainly to teenagers aged 12-17 years old, consisted of 2500 pages; 12 pages were introductory, 10 were main menus, 1500 were information, 179 were practice, 764 were feedback and 35 were help. At the end of each topic and sometimes in certain sub-topics, a quiz was provided which contained 10 multiple-choice questions on the material. “Youth 2004” provided users with three types of navigation paths in addition to Internet Explorer’s back and forward navigation tools. The users had the ability to navigate through the path structured by the programmer via the site map or from the menu appearing on each page.

[The WAI Guidelines for Level A Conformance \(priorities 1\)](#) have been used as standard for the configuration of the key activities which were performed as part of the evaluation and the construction of the content areas of “Youth 2004” considering simultaneously users with disability and generally users of internet that do not have access in specialised technologies and plug-ins. More specifically, the evaluation key activities was:

1. Visual inspection using full-featured graphic user interface (GUI) on Windows and Mac-OS (e.g. Internet Explorer version 5 and above, Netscape 6 and above, Opera).
2. Visual inspection using GUI with Java-script turned off.
3. Visual inspection using GUI with different fonts.
4. Inspection using screen readers ([JAWS](#), [HAL](#)) in cooperation with disabled user focus groups.
5. Source code inspection of sample pages.
6. Validation of the pages using the web based accessibility validation tool [Bobby](#).
7. Validation of the HTML code by using [w3c automatic validations](#).
8. Validation of the CSS code by using [w3c automatic validations](#).

#### *Attitudes Instrument*

A questionnaire was created in order to elicit relevant information on the participants' perception, and attitudes towards using the educational web site “Youth 2004”. Initial drafting of questions for the instrument relied upon survey research handbooks such as those by Alreck and Settle (1995), DeVellis (1991), and Oppenheim (1992). Due to the study's

unusual context, no questions were taken directly from other studies. The dynamics of the Olympic Games milieu proved too complex to adopt items directly from other work. Nevertheless, items for the instrument were built from well-established constructs such as those in Davis's (1993) Technology Acceptance Model. Throughout development, our imperative was to build an instrument that would not be biased inadvertently or uncontrollably by a multitude of demographical and web credibility factors.

After an initial attempt to operationalize technology acceptance constructs as questionnaire items, specialised consultants were asked to evaluate the instrument. Three groups of experts were approached: English language experts, software industry professionals, and scholars in human-computer interaction.

The language experts helped eliminate unintended complexity and imprecision in wording. English experts' remarks also helped ensure cultural neutrality and detect wording that might bias responses. These experts reviewed questions in such detail that in some cases they identified individual words that 'didn't feel right'. Software industry professionals and scholars in human-computer interaction suggested ancillary constructs and operationalization techniques suitable to the goals of the study, in addition to critiquing the instrument for clarity.

All told, the several rounds of draft critiques resulted in inclusion of many items related to demographics and web credibility background, and a host of changes in wording and concept representation. Every time a set of changes was made, the questionnaire was reviewed again by the consultants, until the instrument was deemed adequate.

Throughout this process of question development, we also explored different formats for gathering information online. After various prototypes, we settled on a format that used a 5-point Likert-type scale (1=strongly disagree, 2=disagree, 3=neither disagree nor agree, 4=agree, 5=strongly agree) for each of the 24 questions on Web credibility (see Table 4). This format allowed people to select a response from "1," to "5," representing their disagreement or agreement on the particular item respectively. For the demographic questions, that gathered information on participants' age, nationality, grade and gender, we used drop-down menus.

### **Procedure**

The researchers attended each computer class offered in fall 2002 looking for volunteers for the study. Students were asked to sign a form indicating their wish to participate or not to participate. The study took place during December 2002.

The participants were requested to access "Youth 2004" from each designated computer lab facility on their schools. The internet address, "<http://www.olympiceducation.gr>", of the educational web site was installed into the browser of each computer workstation. Each lab was equipped with at least ten Windows-based multimedia computer workstations. All schools used the same network system to access the internet. Whereas "Youth 2004" contained audio, a small headset was connected to the soundcard. This ensured that other participants in the room would not hear the audio from the computers.

All the participants were requested to access the web from computers with the same configuration ensuring that "Youth 2004" was viewed equally among all participants. More

specifically, this ensured smooth video-audio playback and flash movies during the browsing. If participants had been allowed to access “Youth 2004” from other locations, smooth internet movies playback could not be guaranteed. However, this request was very difficult to be verified from the researchers since the students could have browsed the Web site at their homes.

During testing days, in each school, scheduled groups of 10 participants went to the computer lab between 8am and 2pm at one-hour intervals. They were randomly assigned a computer workstation and were told the instruction would last approximately one hour. Once all participants had been seated, the instructor read a pre-written set of instructions to the group. This ensured instruction consistency throughout the testing. Once the oral instructions had been given, participants were instructed to double click on “Youth 2004” favorite icon to begin their browsing. Instruction, practice, and evaluation for this study were held on four separate and successive weeks. The groups met for 45 minutes, 2 times each week.

All participants were asked to enter their full name in the beginning of the final lesson. This information was not tracked for the experiment; it was the hope of the researcher that the participants would take the instruction more seriously if they were asked to enter their names. Each questionnaire was coded in order to track responses by participant and age group, yet maintain confidentiality of responses.

During data collection procedures, all participants were assured that the questions asked in this study were not evaluative and that their responses to the survey were only for academic purposes and would be kept confidential.

Participants answered an on-line attitude questionnaire by drawing on their cumulative experience using “Youth 2004”. Upon completion of the questionnaire, the participants were prompted to submit their answers. These answers were coded and automatically e-mailed to the researcher each time the submit button was used. The code advised the researcher of the age group from which the subject participated. The data collection went faster than expected, requiring less than one week, due to the power and reach of the World Wide Web.

### ***Design***

Due to practical limitation, a field experiment, instead of a laboratory experiment was conducted to test the hypotheses. The experiment is a factorial design with sex groups (boys and girls) and age groups (15-17 years old and 12-14 years old) as independent variables, and attitude - perception performance as dependent variable.

Factor analysis was conducted to identify underlying clusters or relationships concerning the learners' perception towards the educational web site “Youth 2004”. Independent-samples *t* test analyses were conducted to investigate the differences of this perception among the age and sex of the participants.

The hypotheses of this study were:

H<sub>1</sub>: There are multiple dimensions underlying the 24 attitude items toward the educational web site

H<sub>2</sub>: The boys will have more positive attitudes than girls toward the educational web site

H<sub>3</sub>: The children aged from 12-14 years old will have more positive attitudes than kids aged from 15-17 years old toward the educational web site

## Results

Means and standard deviations for each factor in this study are presented on Table 1, while the means and standard deviations for the sex and for the age groups are presented on Table 3 and 4 respectively. The results of each analysis are given separately below.

Table 1. Means and standard deviations for each factor.

Factors	N	Mean	S.D.
Suitable for audience	317	4.60	.39
Appropriateness of information's web format	317	3.95	.44
Easy to direct and to be oriented	317	4.50	.36
Interaction and feedback	317	4.24	.40
Graphic and multimedia design	317	4.89	.25

<sup>1</sup> Scale: 1=strongly disagree, 2=disagree, 3=neither disagree nor agree, 4=agree, 5=strongly agree

### Factor Analysis

A principal component analysis of the 24-item scale was performed in order to investigate the underlying dimensions of the educational web site's evaluation, using the SPSS Factor Analysis program. Prior to performing principal component analysis the suitability of data for factor analysis was assessed. Inspection of the correlation matrix revealed the presence of many coefficients of .3 and above. The Kaiser-Meyer-Olkin values was .787, exceeding the recommended value of .6 and the Bartlett's Test of Sphericity =5406.535, reached statistical significance ( $p<.001$ ), supporting the factorability of the correlation matrix (Tabachnick, & Fidell, 2001).

Results indicated that our initial hypothesis of multidimensionality was correct. The principal components analysis revealed the presence of five components with eigenvalue exceeding 1, explaining 30.2 per cent, 16.7 per cent, 9.7 per cent, 8 per cent and 4.9 per cent of the variance respectively. An inspection of the screeplot revealed a clear break after the fifth component. Based on screeplot and the eigenvalues, it was decided to retain five components for further investigation. To aid in the interpretation of these five components, Varimax rotation was performed (Stevens, 1996). The rotated solution (presented in Table 4) revealed the presence of simple structure, with five components showing a number of strong loadings, and all variables loading substantially on only one component. The five factors solution explained a total of 69.5 per cent of the variance, with component 1 contributing 17.6 per cent, component 2 contributing 16.1 per cent, component 3 contributing 14.5 per cent, component 4 contributing 11.4 per cent and component 5 contributing 9.8 per cent. The interpretation of the five components was defined as follows:

- (1) Suitable for audience, (5 items)
- (2) Appropriateness of information's web format (6 items)
- (3) Easy to direct and to be oriented (6 items)
- (4) Interaction and feedback (4 items) and
- (5) Graphic and multimedia design (3 items).

Table 2. The rotated loading matrix from the factor analysis <sup>1</sup>.

Items	1	2	3	4	5	H <sup>2</sup>
There is a paragraph on the page explaining what it is about	.855					.874
It is clear how to navigate through the resource's pages	.847					.769
The site is well-organized along logical lines	.711					.751
The site presents some information I disagree with	.871					.852
The site presents some information I think is wrong	.649					.855
The up-to-date information makes a difference for my level		.832				.822
The site is very quickly loaded		.571				.577
The site would be difficult for users with disabilities or special needs to use.		.550				.602
The authors often use some absolute words (like "always" or "never")		.680				.572
The website games were very easy for me		.649				.775
The games were rather boring		.646				.779
The frames, which are used in the site, are applied in a meaningful manner that aids navigating			.622			.598
The information is presented clearly and logically in a format useful to me			.633			.793
The graphics are used wisely to enhance and supplement the text			.704			.605
The page leads me to some other good information (links)			.645			.570
When I first entered the tour, I could choose from different options or paths to take			.553			.487
The tour allowed me to visit a place that I would never be able to visit in real life			.479			.544
There is a high percentage of dead or inactive links either internally or externally				.701		.602
I have gotten more information from an encyclopaedia				.622		.743
Throughout the tour, I could always get back to the beginning				.648		.795
The tour did not encourage me to learn more about the topic				.790		.750
The site's design is appropriate to its subject matter.					.819	.674
The site looks professionally designed					.749	.605
The resource is a collection of data in special formats such as images, audio or video data					.638	.500
% of variance	17.63	16.13	14.54	11.40	9.82	
Total variance						69.53
Eigenvalue	4.232	3.872	3.490	2.737	2.356	

<sup>1</sup> H<sup>2</sup> = communalities

### **Reliability Analysis**

Coefficient alpha is the statistic mostly used to assess the internal consistency. The Cronbach-alpha coefficient was calculated for each of the sub-scales. The "suitable for the audience" factor had an  $\alpha = .87$ , the "appropriateness of information's web format" had an  $\alpha = .83$ , the "easy to direct and to be oriented" factor had an  $\alpha = .79$ , the "interaction and feedback" factor had an  $\alpha = .76$  and the "graphic and multimedia design" factor had an  $\alpha = .68$ . Although statistical texts (DeVellis, 1991) suggest that scale with reliabilities more than 0.70 should normally be considered as acceptable, in practice lower limits have been set up as acceptable by researchers.



### Independent-Samples *t* Test Analysis

An independent-samples *t* test was conducted to evaluate the hypothesis that boys have more positive attitudes than girls toward the educational web site. The test revealed no significant difference among the two sex groups, in any case of the factor analysis, counter to the research hypothesis. As shown in Table 2, the boys reported similar scores with the girls.

Table 3. Means<sup>1</sup> and standard deviations for the sex groups in each factor.

Factors	Sex	N	Mean	S.D.
Suitable for audience	boys	148	4.58	.40
	girls	169	4.61	.38
Appropriateness of information's web format	boys	148	3.99	.42
	girls	169	3.93	.46
Easy to direct and to be oriented	boys	148	4.51	.36
	girls	169	4.48	.36
Interaction and feedback	boys	148	4.23	.43
	girls	169	4.25	.38
Graphic and multimedia design	boys	148	4.87	.28
	girls	169	4.90	.22

1 Scale: 1=strongly disagree, 2=disagree, 3=neither disagree nor agree, 4=agree, 5=strongly agree

Another independent-samples *t* test was conducted to evaluate the hypothesis that children aged from 12-14 years old have more positive attitudes than kids aged from 15-17 years old toward “Youth 2004”. There was significant difference in scores for children ( $M=4.66$ ,  $SD=.32$ ) and kids ( $M=4.49$ ,  $SD=.47$ ) in the factor “*suitable for audience*”  $t(315)=3.816$ ,  $p<.01$ . Similar, there was significant difference in scores for children ( $M=4.33$ ,  $SD=.32$ ) and kids ( $M=3.72$ ,  $SD=.33$ ) in the factor “*appropriateness of information's web format*”  $t(315)=16.072$ ,  $p<.01$ . Also, significant difference was revealed in the factor “*easy to direct and be oriented*”  $t(315)=13.420$ ,  $p<.01$ , between children ( $M=4.78$ ,  $SD=.18$ ) and kids ( $M=4.33$ ,  $SD=.34$ ). Finally, there was significant difference in scores for children ( $M=4.65$ ,  $SD=.23$ ) and kids ( $M=3.99$ ,  $SD=.24$ ) in the factor “*interaction and feedback*”  $t(315)=23.990$ ,  $p<.01$ . As shown in Table 3, the children aged from 12-14 years old scored significantly higher in the above four factors, according to the hypothesis. No significant difference was found between the two groups on the “*graphic and multimedia design*” of the site.

### Discussion

Within the context of arguing that the credibility of Web based information is extremely important when it is considered as a source of information, this study developed a psychometric questionnaire in order to evaluate the educational web site “Youth 2004” considering the attitudes and the perceptions of Greek Australian students. The study also sought to investigate differences among the age and the sex of participants.

Table 4. Means<sup>1</sup> and standard deviations for the age groups in each factor.

Factors	Age	N	Mean	S.D.
Suitable for audience	12-14	120	4.66	.32
	15-17	197	4.49	.47

Appropriateness of information' s web format	12-14	120	4.33	.32
	15-17	197	3.72	.33
Easy to direct and to be oriented	12-14	120	4.78	.18
	15-17	197	4.33	.34
Interaction and feedback	12-14	120	4.65	.23
	15-17	197	3.99	.24
Graphic and multimedia design	12-14	120	4.87	.30
	15-17	197	4.90	.22

<sup>1</sup> Scale: 1=strongly disagree, 2=disagree, 3=neither disagree nor agree, 4=agree, 5=strongly agree

Results indicated that the evaluation on a pedagogic website was a multidimensional concept. This fact has been proved from other studies that have examined the role of the World Wide Web as an educational tool (Alastair, 1997; Yang, 2001). The reaction of students to the educational web site “Youth 2004” was encouraging. Analysis of the survey revealed a generally strong positive attitude and perception towards this particular web site. Participants found the materials and interactive learning experiences worthwhile, valued the “Youth 2004” features and believed web resources, as a meaningful educational tool. They were typically agreeable to various statements about navigation, satisfaction, interface design, useful information, additional use and improved learning.

This finding was quite a surprise, given the amount of students’ positive attitude toward the educational site. The explanation in this phenomenon could be that participants in this study had already increased interest in Olympic issues. Factors that could have contributed in this were the web experience of the participants with Olympic Sites, their Greek origin and their previous experience of hosting successfully the Olympic Games of Sydney 2000. If this were the cases, it was also likely that some other group of students were less favourable toward the educational web site of Athens 2004. Also, the use of volunteers clearly had predisposed the students towards more positive attitudes.

Further analysis of the survey showed that the first factor of the questionnaire “*suitable for audience*” had positive ranging from “agree” to “strongly agree”. This reveals that participants found the site easy to use, all necessary special commands were clear and the user interface issues such as menu design and readability of screens had been addressed. The factor “*appropriateness of information’s web format*” had the smallest positive impact on perception of the web site “Youth 2004”. The explanation to this phenomenon could be that students between the ages from 12-17 years old may need more sophisticated and complicated applications to have their work done. The third factor “*easy to direct and to be oriented*” had positive ranging from “agree” to “strongly agree”. This indicates that the resource is organized in a logical manner to facilitate the location of information without navigation problem. Also, students found the interactive learning experiences worthwhile since the respondents rated the “*interaction and feedback*” questions by answering, from “agree” to “strongly agree”. Finally, the strong positive responses on the last factor “*graphic and multimedia design*” made it the most dominant in increasing “Youth 2004” perception. This shows that the educational web site looked professionally designed and appeared visually appropriate to the subject matter.

According to James (2001), web experience of the respondents clearly had an influence on the web site evaluation. Inexperienced users found simple web site to be more useful from complex web site. Other researchers report that prior computer experience positively

influences attitudes toward the computer (Shashaani, 1997; Williams, Olgetree, Woodburn, & Raffeld, 1993). Eastmond and Ziegahn's (1995) concluded that adult students must be technologically proficient or have someone in their immediate support system who is competent in using technology, in order to be successful in Web-based courses. The students who were less proficient and did not seek assistance with the learning environment expressed either no opinion or dissatisfaction with the course. The Web-based learning environment did not motivate these students. Participants of this study had regular access to computer technology in their classrooms over several years. Perhaps, this prior computer experience positively influences their attitudes toward the educational web site. Therefore, these results are addressed to students that are familiar to the web, aged 12 – 17 years old.

The research on how sex changes perceptions of the web site "Youth 2004" showed no significant differences. Boys and girls answered the questions of the survey the same way, indicating similar perception. This suggests that using the educational web site has a positive effect for both sexes. Similar results have been reported by Comber, Colley, Hargreaves & Dorn, (1997) and Mumtaz (2001), who found that girls and boys equally enjoy using World Wide Web. Other researchers report that males have more positive attitudes than females (Sensales and Greenfield, 1995; Shashaani, 1997; Williams et al., 1993). However, most of these studies were conducted with small, local populations of college students. Besides, recent research literacy has showed that, overall boys were no more likely than girls to have a computer at home, or to use it. Whereas, little differences existed between boys and girls in the level of use school computers (National Telecommunications and Information Administration, 2000; U.S. Census Bureau, 1997).

The research on how age changed perceptions of the web site "Youth 2004" showed significant differences. The older respondents (15-17 years old) tended to be more critical of amateurism on a site, compared to the younger children (12-14 years old). This means the older kids were harsher on sites that had glitches like a single typo or a broken link. The younger children showed a higher level of contentment with the web site, especially in the four following factors: "*Suitable for audience*", "*Appropriateness of information's web format*", "*Easy to direct and be oriented*" and "*Interaction and feedback*". However, using the educational web site has a positive effect for both age groups and these differences were typically small. On the one hand, this is in agreement with McKenna, (1997) and Tapscott, (1998), who reports that, teens and young adults generally have more favorable attitudes towards technology than older adults. On the other hand it is in disagreement with Fredericksen, Pelz, Shea, & Swan, (2000) and Swan, Shea, Fredericksen, Pickett, Pelz, & Maher, (2000), who report that, younger students were the least satisfied with Web-based learning than older students.

In conclusion the student's feedback from the questionnaires indicated a general level of satisfaction and contentment with this particular web site. Yet, in order to have the learners make constructive and flexible use of the educational network technologies, the "suitability for the audience", the "appropriateness of information's web format", the "easiness to direct and to be oriented", the "interaction and feedback" and the "graphic and multimedia design" seem to be crucial considerations. Perhaps, adherence to these basic principles will not only improve overall site impressions, but also will increase visit frequency to the Web site concerned. The scale developed in the present study can be a useful tool for the evaluation of other relative web sites by web developers.

Research and development in this area will be continued with the view to refining any kind of web-based educational environment so that it meets and fulfills all expectations for supporting and enhancing pupils and students learning process. More studies should be conducted to investigate the effect of web experience on student's attitudes toward the World Wide Web, especially when its effect is linked to age. Also, one can reasonably assume that most people – regardless of gender, age, or other demographic factors – access web site credibility in similar ways. Although real differences do exist, it's more striking to see how many things were not different, suggesting that the various demographic groups shared similar approaches to evaluating web sites.

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