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## EVALUATION FACTORS AND STUDENTS' PERCEPTION TOWARD THE EDUCATIONAL WEB SITE OF ATHOC "YOUTH 2004"

Vernadakis, N.<sup>1</sup>, Iraklis, K.<sup>1</sup>, Giannousi, M.<sup>2</sup>, Politis, K.<sup>1</sup>, & Kioumourtzoglou, E.<sup>2</sup>

<sup>1</sup>Organising Committee for the Olympic Games ATHENS 2004 S.A.

<sup>2</sup>Democritus University of Thrace, Department of Physical Education and Sport Science

### ABSTRACT

The purpose of this study was to evaluate the enjoyment and the perceptions of Greek American students toward the educational web site "Youth 2004" of ATHOC. In addition to develop a questionnaire that can be a useful tool for the evaluation of other relative web sites. Participants were 295 Greek American students, between the ages from 12-17 years old. Data was collected using an on-line survey. The statistical treatment of data included factor and reliability analyses. Results from the factor analysis yielded five factors accounting for 71.2% of the variance. They were defined as follows: a) suitable for audience (5 items), b) appropriateness of information's web format (6 items), c) easy to direct and to be oriented (6 items), d) interaction and feedback (4 items) and e) instructional design (3 items). The reliabilities of the questionnaire were satisfied (Cronbach alpha=.80). The student feedback from the survey indicated a general level of satisfaction and contentment with this particular web site. In conclusion "Youth 2004" achieves the educational and pedagogic objectives without it needs particular improvements.

**Key words:** World Wide Web, questionnaire, on line research, satisfaction, Olympic Games.

### INTRODUCTION

The World Wide Web is a very complex information technology network currently consisting of several hundred million web pages and over a hundred million users. Each day, users search web sites, in order to find the most convenient, relevant and up-to-date information they need. On the web, users typically search for information by navigating from page to page. The content of pages, associated with these links, is usually presented to the user by some snippets of text graphic (Dragulanescu, 2002).

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 teens go online are: a) to send/receive an e-mail (83%), b) to get information/research (68%), c) to play games (51%), d) to use chat rooms (40%), e) to download music/videos (38%), f) to send an electronic greeting card (31%), g) to shop (26%), h) to read news/sport/other (23%), i) other (19%).

One can understand from the above that the Web not only provides but it can also be used as a new learning environment, enriched with numerous pedagogic possibilities. The colorful and visually engaging appearance, rich resources, online audio and other interactive features, combine to make the Web an enormously valuable learning tool (Oliva & Pollastrini, 1995; Owston, 1997; Peterson, 1997).

The educational technology literature abounds with arguments supporting and opposing the value afforded by technology. Research into the impact of computers and technology on learning tends to show mixed results. Early meta analyses (Kulik and Kulik, 1986; 1991) reported significant achievement benefits among learners using computers compared to others in conventional settings. However, more recent writing has questioned the findings of much of this early research in terms of its generalisation to mainstream practice (Stoll, 1996). Research has also demonstrated that the size and nature of the achievement gains derived from technology-supported teaching are no

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more, and perhaps even less, than those achieved in classrooms where such alternative strategies as teamwork, collaboration, esteem-building and self-directed learning are prominent (Hattie, 1992).

It is now a well-established and widely accepted concept that assessment plays a central role in the educational process. The search for assessment methods able to reach an objective judgment of something is a crucial goal (Valenti, Cucchiarelli & Panti, 2001).

Worldwide, there is a shift away from traditional learning towards open learning. The aim of open learning is to provide unhindered access to learning resources, so that technologically supported freedom of information may be turned into freedom of education for people pursuing their own learning needs (Virtual Campus, 1998).

Results of a meta-analytical study (Ayersman, 1996) show that perceptions and attitudes toward technology are functionally important in promoting effective learning. 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 following research questions for this study were addressed:

1. Factor analysis: Is there a single dimension or are multiple dimensions underlying the 40 attitude items toward the educational web site?
2. Reliability analysis: How reliable is our 40-item measure of perceptual control?

The purpose of this study was to evaluate the enjoyment and the perceptions of Greek American students toward the educational web site "Youth 2004" of the Organizing Committee for the Olympic Games ATHENS 2004. In addition to develop a questionnaire that can be a useful tool for the evaluation of other relative web sites.

## METHODS

### Participants

Two hundred ninety five ( $n=295$ ) Greek American students, 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 fifteen (39%) middle school students and one hundred eighty (61%) high school students. One hundred forty one (48%) of the participants were boys and one hundred fifty four were girls (52%). Students were asked to participate in this study as part of their overall computer class instruction, but were given the option not to participate. Students who chose to participate were given a CD-ROM of "Youth 2004" and other recollectives of ATHENS 2004.

### Apparatus

*Software Instrument.* The educational web site "Youth 2004" was developed by the education and training department to support the Olympic education program of 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 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.



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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.

*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". The first part of the survey pertained to background information. The second part consisted of 40 attitude and perception statements about educational web site experiences indicating levels of agreement or disagreement on a 5-point Likert-type scale with 5 standing for strong agreement (1=strongly disagree, 2=disagree, 3=neither disagree nor agree, 4=agree, 5=strongly agree). This format allowed participants to select a response from "1," to "5," representing their disagreement or agreement on the particular item respectively. The Cronbach alpha coefficient of the survey was  $\alpha = .78$ , suggesting the internal reliability to be quite acceptable (Green & Salkind, 2003). Responses to the questions were summed to provide an overall perception score for each participant.

## Procedure

The researchers attended each computer class offered in winter 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 April 2002.

The participants were requested to access "Youth 2004" from each designated computer lab facility on their schools. The internet address, "[www.olympiceducation.gr](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 workstations had the same infrastructure (hardware, software), and 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 other computers.

All the participants were requested to access the web from computers with the same configuration ensured 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.

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.

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

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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 Greek American students as independent variable, and attitude - perception performance as dependent variable.

## Data collection and analysis

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. After data collection, factor and reliability analyses were performed. Factor analysis was conducted to identify underlying clusters or relationships concerning the learners' perception towards the educational web site "Youth 2004". Reliability analysis was conducted to investigate the reliability of the questionnaire. Results from the factor analysis (principal axis factoring with varimax rotation) yielded five factors accounting for 71.2% of the variance. The loading of items ranged from 0.88-0.49, which is considered well to excellent (Tabachnick & Fidell, 2001). Following are the interpretations of each factor: suitable for audience; appropriateness of information's web format; easy to direct and to be oriented; interaction and feedback; instructional design.

## RESULTS

Table 1: Factor analysis of students' perception toward the educational web site.

Factor	Items included	Eigen -value	% Va- riance	Alpha	Scale mean	Scale S.D.
Suitable for audience	Q3, Q6, Q7, Q17, Q18	4.39	18.28	.89	4.59	.40
Appropriateness of information' s web format	Q5, Q8, Q15, Q20, Q36, Q39	4.35	18.14	.84	3.97	.44
Easy to direct and to be oriented	Q10, Q12, Q13, Q25, Q32, Q35	3.23	13.48	.80	4.51	.36
Interaction and feedback	Q11, Q29, Q31, Q34	2.85	11.90	.77	4.26	.40
Instructional design	Q2, Q23, Q28	2.26	9.42	.71	4.90	.24

## Factor Analysis

A principal component analysis of the 40-item scale was performed in order to investigate the underlying dimensions of the educational web site's evaluation, using the SPSS Factor Analysis program. Only those components with an eigenvalue greater than 1.0 were retained and rotated (Stevens, 1992) with Varimax rotation. The results of the factor analysis are presented in table 1.

The questionnaire abided the criterions of the factorization with the KMO=0,810 and the Bartlett's Test of Sphericity =5345.483 and  $p<.001$ . The factor analysis indicated that our initial hypothesis of unidimensionality was incorrect. Based on the eigenvalues, five factors were rotated using a Varimax rotation. The rotation solution, as shown in table 4 yielded five (5) factors which accounted for 71.2% of the total variance. They were defined as follows: a) suitable for audience (5 items), b) appropriateness of information's web format (6 items), c) easy to direct and to be oriented (6 items), d) interaction and feedback (4 items), e) instructional design (3 items).

## 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



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“suitable for the audience” factor had an  $\alpha = .89$ , the “appropriateness of information’s web format” had an  $\alpha = .84$ , the “easy to direct and to be oriented” factor had an  $\alpha = .80$ , the “interaction and feedback” factor had an  $\alpha = .77$  and the “instructional design” factor had an  $\alpha = .71$ . 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.

## DISCUSSION

The results indicated that the evaluation on a pedagogic website is a multidimensional concept. This is a fact that 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 mixed. Overall results indicated that most students were positive about learning through interactive web based projects. 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.

Analysis of the survey revealed a generally positive attitude and perception towards this particular web site. Most specific 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 “instructional 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). Therefore, these results are addressed to students that are familiar to the web, aged 12 – 17 years old.

## CONCLUSIONS

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 “instructional design” seem to be crucial considerations. The scale developed in the present study can be a useful tool for the evaluation of other relative web sites by web developers or even managers.

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

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attitudes toward the World Wide Web, especially when its effect is linked to age. Also, one can reasonably hypothesize 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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