GRAPHICAL USER INTERFACE IN E-LEARNING SYSTEMS DEDICATED FOR SENIORS

Łukasz Tomczyk
University of Silesia
Bankowa 12, Street, 40-007 Katowice, Poland
tomczyk_lukasz@tlen.pl

Abstract: An important component of every e-learning course is a correctly constructed graphical user interface, constituting the pier between the remote educational system and trainee persons. In the text individual components taken into account were left responsible for correct creating of display and navigational layer of e-courses. The supplementations of the article are author’s own findings taken amongst students of the III Century University in Cieszyn about the process of the remote education.

Keywords: graphics interface user, seniors, e-learning

INTRODUCTION

Nowadays the information has become one of the basic economic resources, in addition to labour, land and capital. The rapid development of the organization, market globalization and technological changes led to strong demand for information. In addition, phenomena such as the dissemination of information technology, falling prices of hardware and software, and a freeware application development resulted in that, the world became a global village a long time ago. The resulting transformations impinge on all areas of computerized human existence, and therefore also in the sphere of education. Currently popular trend of learning provided for life coupled with the increase in educational institutions and the permanent rise in the level of competence in the field of information technology (IT) among the public results in the introduction of new solutions in the field of education.

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Stabilized so far education space evolves through the implementation of the theory and practice of educational tools using Internet technologies. Currently, less surprising is that the classes under the e-learning (DL) are already in primary school, as a complement to material transmitted to a stationery, while the proportion of classes at many universities is carried out as a sterling equivalent of the classical form of education. There are, however, dilemmas associated with this process. It is important to develop properly, in terms of educational and technical accuracy, the methodology for creating online courses, as well as animate and promote these activities among groups that may directly increase their capacity to develop knowledge and interest. The popularity of learning via the Internet due to the following factors listed in the following groups:

1. **Social**: increase user awareness about IT applications in different areas of life, the need for constant improvement, enlarging the number of people benefiting from TI, the implementation of the DL training projects financed from external sources (eg the European Social Fund).

2. **Economic**: to reduce training costs (rental of meeting rooms, pay enough for teachers, the implementation of platforms based on the licenses free of charge), development of professional skills prerequisites quality and quantity produced goods.

3. **Technical**: the development of infrastructure (speed, quality, accessibility or connectivity) and application (selection training platforms).

4. **Personal**: self-development, the desire to permanently enhance the potential of new technologies, gaining new training and competence.

Today, the idea of e-learning has been implemented in educational practice setting up new fields of research related to the effectiveness of that method of educational practices. In this area also includes the issue of information transmission efficiency by designing appropriately tailored graphical user interfaces (GUIs). This process is essentially a complex activity because it requires the inclusion of the individual components, which are contained in different, often independent disciplines. When creating a GUI is desirable to use achievements in areas such as theoretical and practical disciplines: design of information systems, psychology, pedagogy.

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2 Ł. Tomczyk, Senior e-learning as part of the Information Society, „E-Mentor”, nº 3/30, [ISSN 1731-6758], p.68.
(teaching distance education, media pedagogy, andragogy), computer graphics.

1. DISTRIBUTION AND SELECTION OF GRAPHICS ELEMENTS

Graphic design layout of individual items on the page (called layout) and navigation (relevant, functional planning elements for movements of the service) is one of the most important factors on which Internet users pay attention to website visitors. On the Internet it is important first impression that the person using the reference web page. It is assumed that have strategic importance of the first four clicks - if at that time you will enjoy service is considerable likelihood that inasmuch it for longer. Effect of institutions on the design and layout modification is dependent on the type of software solutions which have been applied: Page created from a template (a relatively small possibility of modifying the display structure) or solution created to measure. Therefore refined graphic layout should characterize the determinants listed below:

- lightweight applied graphics - the smaller the volume of image files that will load faster the next time the service and the server and internet connection will be less busy,
- consistency - to maintain a uniform standard in the graphic aspect of your service,
- transparency - a clear appearance of individual pages and graphics service,
- a clear and intuitive navigation throughout the site,
- visibility of the "strategic" elements.  

Significant role in the educational process plays an image. B. Siemieniecki notes that a rich representation of the Iconic association, reaches into the deeper structure of knowledge, polished sphere, therefore, is the effectiveness of visual memorization. Visual perception is conditional because it depends on such factors as the characteristics of the display material, the pace of presentation, type of task. Achieving the desired effect of receipt of a message requires a properly designed GUI. Colour table incorrectly can make the screen for the recipient become unreadable, and therefore

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incomprehensible. Difficult to clarify or supplement the content can become invisible or vice versa, less important information can interfere with reception of the more significant message. Therefore using the correct colour should be linked logically to the objectives of the functional on-line course so as not to cause a change in the interpretation of shown communication. The following Table 1 presents the psychological impact of colour choices in the context of their use in DL processes.

**Table 1. Psychological influence of chosen colours**

<table>
<thead>
<tr>
<th>Colour</th>
<th>Symbolism</th>
<th>Compared with other colours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>Forms a relationship with something heavy, incalculable, dramatic, elegant, express the concentration on itself, mystery, pay attention.</td>
<td>It is well harmonizing with bright shades of red, blue, green. Black and grey are creating conservative climates.</td>
</tr>
<tr>
<td>White</td>
<td>Cleaness, hygiene, capitulation, humility</td>
<td>In comparison with light pastel colours it is soft, spring. Red is brightening blue and green.</td>
</tr>
<tr>
<td>Grey</td>
<td>Colour of the tolerance, neutral, modest colour, it is arousing the confidence, expressing the need of the balance and is symbolizing the formality.</td>
<td>In comparison with blue is summoning corporate, uniformed world.</td>
</tr>
<tr>
<td>Red</td>
<td>Colour hot, dangerous, embodies the strength, power, love, and signals the need for activity, raises the level of emotion, a sign of confidence, inner strength, and inspiration.</td>
<td>Compared to the green is associated with the Christmas period. Puts the colour blue. Overview of violet may cause an exaggerated impression of power.</td>
</tr>
<tr>
<td>Orange</td>
<td>Heat, energy, fun, joy of life, variation, colour, creative imagination and inspiration, to the eye.</td>
<td>Well with the blue. Red, yellow and orange to a fiery combination. Compared with green creates an exotic atmosphere.</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Colour</th>
<th>Description</th>
<th>Combinations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow</td>
<td>Colour of the sun, a symbol of envy, cowardice, cunnings. Is disorganized. Extraversion, creativity, the excess of colour can be tiring.</td>
<td>Perfect colour to make it appear excitement or to boost grey or blue.</td>
</tr>
<tr>
<td>Green</td>
<td>Freshness, calm, but also to plait, the symbol of the need of the internal balance, agreements and pliancy, is identifying also protectiveness and the nature.</td>
<td>In combination with blue is forming a relationship with the nature, with height. Green with yellow or white is creating „sports” colours.</td>
</tr>
<tr>
<td>Blue</td>
<td>Has a soothing effect, carries joy and the peace, an impression creates cleanness and freshness; it is associated carefully, with faithfulness, arousing the confidence; powders blue with symbol of dreams, the Romanticism and the safety.</td>
<td>With yellow and pink is summoning the spring atmosphere. With ordinary looks smart. Well matching with green.</td>
</tr>
<tr>
<td>Navy blue</td>
<td>It is expressing the respect, the dignity and the organization, the conservatism and the logicalness.</td>
<td>In combination with metallic silver is associated with elegance.</td>
</tr>
<tr>
<td>Violet</td>
<td>Colour of the mysticism, of space, freedoms, for remarkable character; means the friendship and the spontaneity; he/she is removing the tiredness, he is relieving stresses and tensions.</td>
<td>The green creates a joyful atmosphere, with a pink creates a feminine colours.</td>
</tr>
<tr>
<td>Brown</td>
<td>Is associated with sadness and longing, expresses the naturalness, simplicity and reliability, and inspires confidence.</td>
<td>The green colour makes the earth; you can lighten it up by the yellow or orange. The purple and green make up the conservative elegance.</td>
</tr>
</tbody>
</table>

In the presentation of images to choose and combine colours in a manner that enables the user to clear and easily receive information. The colour should serve to contrast the information from less important material. However, it should be noted that a plurality of applied colour makes it difficult to assimilate information, so that their educational value is reduced. Perceived colour depends on the colour surrounding the image, in particular, where the colour information are encoded, so the most important principle for the use of colour is their skilful selection takes into account the specific characteristics of colour and their interaction with other elements of the palette. In addition to colour an important determinant of the efficiency of teaching is the use of animation, which during the presentation should have the possibility of accelerating, slowing, stopping, and change the course of the observed phenomena and processes. Special attention during the design of the GUI deserves selection of numbers, letters and special characters, because a comment is written in many cases a necessary complement to the display of images of static and dynamic. Therefore, there is the problem of selecting the font, so that the educational content depicted in the reception was friendly, because it happens that the author of the course with a wealth of types and colours of the distorting effect of falls in the going over the top. Proper use of fonts is particularly important when the courses are dedicated to those requiring special attention such as seniors or children. To facilitate the identification marks text font should be presented booster printed or handwritten letter in particular the grammar principles. The studies show that the most legible fonts are: Arial, Arial Bold, Times New Roman Bold Italic, Symbol, and MS Sans Serif. Used the letters should be large enough so that the difficulty in reading did not obscure the content. Wherever possible and reasonable to use more optimally selected graphic elements (arrows, sliders, pictograms) than verbal information.5

Selection of graphic elements of the e-learning system is a folded activity alone in itself, because apart from very specification tied with combining colours, with applying the relevant font, must take features into account for the recipient. Seniors by virtue of their specific properties are standing out in the plain of the education assisted by a computer from other groups e.g. of children, young people or persons in an economically productive age, so working out the perceptual, motor, memory, intellectual, biological structure of e-routes taking changes in the sphere into account is becoming necessary.

2. PROCESS DESIGN - THE PRACTICAL REMARKS

As pointed out by G. Billewicz if we want the end user (client learning resources) effectively use the benefits of e-learning one must have the necessary proficiency in IT and the learning environment should be characterized by friendliness. Two fundamental aspects of any computer application is the functionality (ability) to problem solving and presentation located in the service interface (windows, menus, on-line help, documentation, explanations, tips, etc.). The appearance of the GUI the user should decide the type and purpose of the use of the system. It is currently evolved into a new interdisciplinary specialization sector dealing with communication between a user and a computer system called the Human Computer Interaction (HCI).

Among the many important indications for the construction of the GUI is to correctly take into account the following recommendations:

- collecting comments from members must be present at all stages of the design and operation of the system,
- programmers responsible for project implementation should be aware that quality time not only provides a properly executed technical part of the software,
- it is necessary to fit a specific training platform for the audience,
- it is necessary to ensure that the operation "shortcuts", i.e. bypass the dialogues and communications information for advanced users,
- a system should have a simple error handling - the possibility of withdrawal or cancellation of shares,
- displays an error message should have created a careful, readable analysis of how information should be avoided,
- dialogue with the user should be simple and natural, i.e., preserving the order of the task performed,
- dialogues should be designed taking into account unusual situations,
- language appearing in the system should be similar or identical to the language which is spoken by users,
- the entire system should be characterized by cohesion, dialogue,
• to exercise restraint in graphics and colours and displays the self-help,

• inform you about the time of its tasks, and progress (e.g. by a percentage bar) prevents boredom and gives it a sense of control,

• placement confirmation is acknowledging the effects of work by the user,

• the number of objects should be <= 9, since the average user is able to work efficiently when the number of functions in no more than 9 options in the menu, so the design must take into account the nesting of functions in these tasks,

• the whole time that the system must be available to help

• aid should be transparent, i.e., the use of it can not interfere with the system,

• aid the user must be a generic (to recall, identify, indicate the performance of individual tasks) and to highlight the details of the tasks,

• due to the form of assistance should be considered in its different variants: on-line help, documentation, utility, hot line,

• must be consistent with the commonly used software (typical), excessive creativity in the area of creating applications is not desirable,

• successive versions of the system must take into account the results of observation of users, definitely the best in their natural environment.  

These selected instructions make clear that the process of GUI design is an issue involving the various aspects of theoretical knowledge and practical activities, creating a new interdisciplinary field. However, the realm of words and e-learning is not fixed, because in order to effectively impact teaching requires the inclusion of the complex characteristics of remote users of educational services.

3. SENIORS VS. E-LEARNING

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Knowing the properties and improvement of the learning process by using information technology at a distance require an analysis of needs, opinions and suggestions of the interested parties. During the course of education in the field of new media in Cieszyn University of the Third Century research was conducted using a diagnostic survey among fifty seniors on interest under discussion form of teaching, the desired characteristics of the course should have a good, positive and negative sides and additional preferences. The results show that:

- 18 people (36 per cent.) expressed their willingness to participate in courses conducted by the Internet, while 32 respondents (64 percent) showed no interest in such form of teaching.

- None of the seniors surveyed had ever taken part in e-learning course.

- Among the features that should characterize a good course with the internet, players have exchanged the following elements: simplicity of use (one of the most frequently recurring indications), accessible terminology (one of the most frequently mentioned indications), the corresponding image, the formula step by step „possibility of presenting different versions of applications (e.g. Microsoft Office 2003, Microsoft Office 2007, Open Office). At the same time it should be stressed that 26 people (52 percent) did not respond or indicated that they knew nothing about it.

- Among the positive aspects of e-learning surveyed exchanged: to acquire knowledge without leaving the apartment (mostly emerging indication), the chance for people dependent on the acquisition of knowledge and contact with the world, the choice of time and place of learning, general accessibility, to facilitate learning, to avoid the problem associated with commuting, "rejection" of competence in the field of information technology through participation in such courses, allowing it to work after their completion. 20 people (40 percent) did not respond or said they knew nothing about it.

- The negative qualities of courses via the Internet, students' pass the Third Age: lack of direct contact with the operating activities (the most common indication), no contact with other people (social isolation), lack of a "lively exchange on issues of incomprehensible words between leading and students, lack of compelling the systematic, lack of mobilization, the possibility of mismatches to the level of difficulty of the course participants, the introduction of fees for students, a diverse public perception of the course, no immediate
relief in case of misunderstanding the issues, lack of direct cooperation in the group. 22 people (44 percent). Not reply to a question or stated that they do not know anything about it.

- The vast majority of students surveyed Third Age of 40 people (80 percent) is not willing to pay for their participation in courses conducted by the Internet, while 10 people (20 percent) would pay the fee, provided that the amount would be adjusted to the financial capacity of Polish seniors.

- Having a free choice of learning mode, players pointed out:
  - Traditional classes (group and teacher) - 44 people (88 per cent.)
  - Classes conducted only through the Internet - 2 persons (4 per cent.)
  - Mixed way (some of the material carried out through a course run by the traditional, while some classes conducted over the Internet) - 4 persons (8 percent).  

Conducted survey shows that the idea of learning remote to generate interest among the listeners of the University of the Third Age. Seniors see the "weak" and "strong" the e-learning, while pointing out areas that should be included in the lifetime of the development of this type of courses (an important criterion in that aspect of the current issue GUI). Most problems encountered when designing a dedicated GUI for seniors include two groups of factors:


2. Course: lack of proper preparation of teaching staff for proper preparation of courses for this product group, inadequate deployment of content on the site.

DL properly designed course should include typical mistakes by seniors, which include: Incorrect handling the display, menu navigation and web browser, lack of habit of verifying and monitoring whether the operation or the passage ended in a visible sign of confirmation of its accuracy, the

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7 Ł. Tomczyk, Senior e-learning as part of the Information Society, „E-Mentor”, nº 3/30, [ISSN 1731-6758], p.70-71.
omission of selected significant component operations (shift the cursor, improper handling mouse).

CONCLUSION

The concept of remote education using information technology is recognized and is increasingly widely used as a basis or to supplement educational processes. That trend, despite its attractiveness resulting from the specific IT has not been implemented uniformly to all social groups. Aetiology of this condition results from many complex social circumstances, mental, economic and technical. E-learning which is currently at the stage of development and implementation requires the person responsible (methodologists, programmers, graphic designers, engaged in activities, researchers) to take the analysis in order to raise the level of effectiveness. Significant in this context is to separate components affecting the properly designed online courses, which materially include, among others: the GUI, the selection of content and methods of presenting them, so control and evaluation of progress in science.

The above considerations concerning the generation, respectively, shaped the user interface and other important elements of creating a virtual learning environment should continue to be subjected to the tests, whose results will show the main factors that condition the effective processes to acquire knowledge and skills at a distance. Among the important topics of research in that area should try to take further integration of experience teaching the theory of on-line training describing how effective the selected interface (platform) for various age groups and unions, the type of content presented, and presentation techniques. These studies must take into account the psychological, social, technical, due to the nature of selected groups of participants (seniors, the unemployed, the disabled, and people with low competence in the field of IT).

Can not help but agree with M. Grundtvig - one of the forerunners in the field of adult education, the knowledge that only functional, serving the satisfaction of human needs, cognitive and practical, and to facilitate everyday problem solving is able to raise man to ever higher levels of social and material culture. Wisely built a remote concept of adult education with

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the principles of the theory is still emerging online learning offers opportunities to better prepare them for life, fulfilment of obligations and social roles, to understand reality and to keep up with social change widely understood by computer science.\(^9\) Computerized distance education is already an important pillar of permitting the development of individuals in the information society. Therefore it is necessary to continuously develop solutions on improving the transmission of content to this type of training not only effectively generate new skills and expanded knowledge of the actors involved, but also approached IT humanization and its capabilities especially among groups involved in the phenomenon of digital exclusion.

**LITERATURE**


\(^9\) L. Turos, Andragogy General, Academic Publisher,„Żak”, Warsaw 1999, [ISBN 83-86770-94-5], s.80-81