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EVALUATION OF CHOICE AT DISTANCE LEARNING ON THE EXAMPLE OF THE "INFORMATION SECURITY" COURSE

The importance of distance education and its networked software platforms in the modern world is steadily increasing. In such a study, the student acts not only as an active perceiver of the course, but also as an operator interacting with the software product. Based on this, it becomes necessary to take into account not only the traditional aspects of teaching, but also the ergonomic indicators of interactive teaching materials and their corresponding software interfaces. Optimization of this component increases the digestibility of educational material and reduces the probability of operator's errors.

Reducing the possibility of operator error as well as reducing the likelihood of extreme situations and reducing the risk factor are among the leading design features. If such a situation occurs, the object must correctly supply data about its state with feedback signals that will correct operational images and ensure the adequacy of subsequent actions [1].

Along the scheme of interaction between the operator and the system according to D. Norman [2], the processes of thinking take up most of the time of human-computer interaction. Consequently, higher speed of mental processes makes significant increase of the operator's speed. It is impossible to change the user's own speed of mental processes, but the speed of information processing can be increased by analyzing the factors that slow them down.

The speed and reliability of working with educational material can be determined by counting errors and measuring the time spent; however, this provides only an indirect objective assessment without understanding the origins of the problems and difficulties. Taking into account the subjective indicators of users, the developer of the distance course may receive additional information on these issues. These indicators include the level of expectation and the level of user satisfaction.

Satisfaction with a product is a subjective assessment of its quality; Let us consider in more detail the concept of quality of software products. J. McCall was the first to introduce the concept of "usability" as one of the quality factors of software products, as a combination of operability, training and communicativeness [3]. Usability has traditionally been measured based on metrics such as performance, productivity, and user satisfaction. However, only the first two criteria are sufficiently clearly operationalized and described in the specialized literature, but there is still no consensus regarding the understanding of the nature of satisfaction with a software product, its determinants and adequate research methods [4].

Satisfaction with the product, i. e. a high "subjective assessment of its quality" [5] reflects the personal attitude of the user to it. This attitude is formed on the basis of the previous experience of a person's interaction with a certain object, during which this person has repeatedly experienced states of comfort and satisfaction. Thus, in terms of content, satisfaction is manifested in a complex of positively colored emotionally-needful experiences [6].

Since satisfaction is the subject's feeling in relation to an object, it is not available for direct measurement by technical means, but it can be quantified. The following methods can be used to assess the satisfaction of interaction with the software platform:

- indirect methods for assessing satisfaction: statistical analysis of changes in the correlates of satisfaction, structured observation of the user's emotional manifestations, registration of psychophysiological indicators and oculomotor activity;
- methods of direct assessment of satisfaction: interviews, content analysis, subjective scaling and test questionnaires [3].

Additionally, it is necessary to note a problem that is relevant in modern conditions — the choice of a software platform in a set of competing platforms that are similar in functionality, but different in their interface design.

The problems of the relationship between human characteristics and the choice of software products were studied in the works of the following modern psychologists: S. Weinshenk, Alan Baddeley, John Barg, Susan E. Carey, Paul Ekman, Hyunjin Song, Tanya Chartlang, Serge Tisseron, Cloud Kado — they studied the relationship of memory phenomena, personality traits of a person and their relationship with a person's work with a computer and the level of stress experienced. However, in the works of psychologists in Russia and Belarus, this problem was not considered.

The purpose of this work is to identify and describe the types of choice "Information Security" course in the international project of EU Program ERASMUS+CBHE, Enhancement of Lifelong Learning in Belarus/BELL (586278-EPP-1-2017-1-LV-EPPKA2-CBHE-JP).

To achieve this goal, the following techniques were chosen:

1) **Microsoft Desirability Toolkit**. The Microsoft Desirability Toolkit [7] consists of 118 cards with words describing the user's reaction to the program. After testing, participants are presented with a deck of cards and asked to select five words that best describe the software product they are using.

The advantage of this methodology is that it introduces a controlled vocabulary for the participants, avoiding the natural variability of word choice in an arbitrary form of qualitative assessment, which is problematic from a data analysis point of view. Collectively, the words encompass a wide range of possible responses to functions, ranging from the visual appeal of design and functionality to the user in general.

2) **System Usability Scale (SUS)**. This scale was released by J. Brook in 1986. It was originally created for administration after usability testing on systems such as VT100 Terminal applications. SUS is technology agnostic and has since been tested on hardware, consumer software, websites, mobile phones, pre-recorded voice messaging systems [8], and more.

3) **Post-Study System Usability Questionnaire (PSSUQ)**. This questionnaire is a research tool developed at IBM for scenario-based usability assessments. It includes 19 items designed to assess such characteristics of system usability as quick completion of work, ease of training, quality of documentation. This technique allows you to assess the level of satisfaction of end users after working with the system [3].

The results of the survey are summarized in Table 1.

Table 1 — *Summarized questionnaires data*

Test	Mark	%
SUS	A — excellent	11.11
	B — high-end	11.11
	C — good	0
	D — OK	0
	F — poor	77.78
PSSUQ	A — excellent	0
	B — high-end	0
	C — good	33.33
	D — OK	66.67
	F — poor	0

It can be seen that more than 77 % of the participants had a rather negative subjective level of expectations from the "Information Security" course in terms of complexity, accessibility, etc. However, the objective (resulting) level of satisfaction with the course is characterized by a positive attitude towards it, and more than 66 % participants successfully achieve the goals set for themselves when studying the course.

When comparing the data, we got a diagram that shows the distribution of types of choice among students (Figure 1) [9].
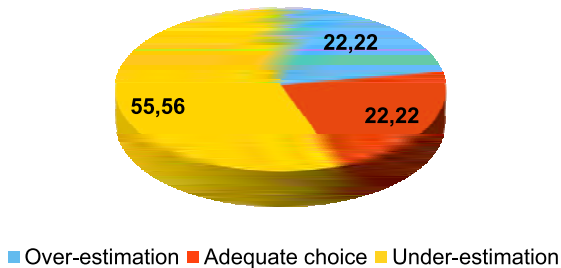
Choice types distribution, %

■ Over-estimation ■ Adequate choice ■ Under-estimation

Figure 1 — *Choice types distribution*

As can be seen from the diagram, we have an underestimated type of choice (more than half). Both an adequate choice and overestimation are demonstrated by a quarter of the respondents. Analysis of the activity log in the Moodle system shows that when choosing "overestimate" the listeners performed work in the last deadlines, after a short rise (they started doing everything quickly, and then slipped behind the schedule). Those who demonstrated the "underestimated" choice did everything early and stayed ahead of schedule until the end of the work, or met it. The listeners who demonstrated adequate selection adhered to the schedule completely without sudden jumps.

MDT showed that those who underestimated initially thought the course interface was error prone and confusing. If overestimated, the resulting testing described the interface as "error prone", "uncontrollable"

and "time consuming". With the "underestimation" type of choice, the situation goes the other way (negative preliminary assessments were replaced by positive final ones). With an adequate choice, the estimates changed little.

It can be noted that those who underestimate the complexity and specificity of the course at the initial stage are weak in studying the course. And as a result of more independent activity than in traditional education, this category of participants loses interest and motivation. Therefore, for this category, it is necessary to provide additional motivating factors in the learning process. In particular, chats with a teacher and correspondence on forums can be considered as such.

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