

SUBSTANTIATION OF THE CHOICE OF SOLVING PROBLEM OF IDENTIFICATION OF THE TESTED PERSON IN THE SDE BY MEANS OF TAKING BIORHYTHMIC INDICATION OF HIS FACE

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Summary. Problems of falsification of knowledge by students in the system of distance learning are considered in this article, offered possible ways of solving the given problem. Justification of the choice of identification of the user of the given system for biometric face reading has been made.

Key words: identification, a system of distance learning, distance learning, falsification of knowledge.

INTRODUCTION

Living in the 21st century – in the time of information technologies we have got a faithful assistant – computer that helps us solve many problems. Its use in our life opened new horizons for humanity, new concepts that can change our life and usual course of things.

The level of informatization is becoming one of the significant reasons of economic development and competitiveness of the region both on the domestic and foreign markets. Information is becoming the most important strategic resource. Modern information technologies allow to create, store, process and provide effective ways of presenting information to the consumer. Recent development of information and computer technologies is very briskly. In this process the important role is played by academic staff and students.

The era of informatics came. The phase of its development can be characterized as telecommunicational. This is a phase of communication, transformation of information and knowledge. Education and work are synonyms today: professional knowledge gets old very quickly, so that is why there is need in its constant improving.

The use of new educational technologies offers real opportunities to build the educational system based on the principles of the open information space. The most promising technology in an open system of education is distance learning technology.

System of Distance Education (SDE) gives equal opportunities to pupils, students, civil and military experts, unemployed in all regions of the country and abroad realize their human right for education and getting information. Just this system can adequately and flexibly respond to the needs of society and ensure the implementation of the constitutional right for education of every citizen. SDE corresponds to the logic of development of the educational system and society as a whole that gives priority to the needs of each individual.

The term "distance education" has not entered till the end both into Russian and into English pedagogical literature. Such variants as "distant education", "Distance Learning" (distant learning) can be occurred [4,6].

Distance learning (DL) – is a set of technologies that provide delivery of the basic volume of the studied material to trainees, interactive cooperation of students and teachers in the learning process, give trainees possibility of individual work on the development of studied material as well as in the learning process [4,6].

OBJECTS AND PROBLEMS

The problem of personal identification [1,2,5] and falsification of knowledge control of the tested person [1,5] cause problem of the financial cost on travelling, living in another city or country etc. Furthermore distance learning seems to be more like correspondence than distant.

To solve the latter problem - the problem of identification let's consider possible solutions and study the following flowchart.

Ways of solving problem of identification of the tested person		
Student (trainee of SDE) passing exam at high school in oral communications	Departure of teachers to the city (country) of the trainee	High school must have branch or office in cities (countries), where students live
Use of optional fitment, equipment and software for removed identification of the tested preventing possibility of falsification of knowledge control		

Fig.1 Solutions of the problem of identification of the tested person

Let's consider each solution separately. The first is when student goes to pass exam to the teacher personally. On the basis of the definition "distance learning" [4,5,6], knowledge control notably examination can be attributed to that part of the training procedures that are carried out without the use of modern information and telecommunication technologies having territorial dissociation of teacher (tutor) and students. Suppose that student lives in Ukraine and studies remotely at one of the universities of the USA, Australia, Japan or the other country and if we consider the fact that the student can learn from 3 to 5 years (depending on if he gets a second, or a first degree), and thus has from 6 to 10 exam periods, so the costs for relocation and living expenses can be very high. For example, a flight in one direction only from Ukraine to the United States will cost from \$ 600 to \$ 1200, respectively for five years of study student will spend from \$ 12000 to \$ 24000 only on flights.

The foreign high school can represent training in pupil native language but even thus it is necessary for trainee to know not only language of the country to which he is going but also disposition and customs of this country. And at last it is necessary to consider physiological features of the trainee: as DL is possibility and for some people it is unique possibility to graduate being physically challenged and for any reasons being limited in movement or have contra-indications of doctors on training in classical high schools. Besides physically challenged people there is a category of people that have previous conviction, that are sentenced in prisons and colonies; they also can get education that increases chances for employment after discharge, thereby it reduces probability of committing new crimes and return to institutions of confinement.

The second solution is departure of teachers to the city (country) of the trainee. For this purpose the high school should rent the equipped with necessary office equipment premises for the period of examinations and also cover teachers' expenses on travelling, residing and meal. Besides, there can be such a situation that high school expenses will exceed the income of given educational services.

The third solution assumes presence of a branch or office of high school in the city (country) where the trainee lives. Such branches should have audiences equipped with computer technics, web cameras, ear-phones and microphones. Before testing trainee should give his identity card and only after that take his place at the computer. While passing the examination (test) there should be an authorized person in an audience whose task is to supervise over tested did not use additional sources and did not confer while answering. However, financial expenses for rent of a premises and energy can exceed profit of educational services.

In the fourth solution it is offered to use such equipment which will allow to identify the remote user for the purpose of getting real knowledge while passing examinations or tests. Identification of a person can be made according to the biometric indicators (data) of a person: fingerprint, geometry of a hand, iris, retina, geometry of the face, voice etc.

Having such equipment it is possible not only to be trained distantly but also to pass examinations on distance that reduces for teachers or students expenses for rent of premises, travelling, residing and meal.

In the table 1 positive and negative features of taking biometric parameters and also their costs and percent of accuracy of these devices are considered.

Table 1. The comparative table of taking biometric parameters of a person

Biometric parameter	Price of the device in \$	% of the error at verification	Features	Features
			positive	negative
Fingerprint	About 100\$	0,00%	<ul style="list-style-type: none"> • Firm parameter • Compact reader • Short identification code 	<ul style="list-style-type: none"> • Complexity of algorithms of identification • Direct contact with equipment • Association with criminal sphere
Geometry of the hand	From 600\$	0,20%	<ul style="list-style-type: none"> • Firm parameter • Simple algorithm of identification • Short identification code 	<ul style="list-style-type: none"> • Bulky reader • Put on the right hand • Used only with Pin-code • Direct contact with equipment
Iris	From 500\$	0,00%	<ul style="list-style-type: none"> • Baffling complexity of counterfeit • Lack of direct contact with equipment 	<ul style="list-style-type: none"> • Complexity of algorithms of identification • Discomfort of the thought about detrimental effect on the eyesight
Retina	About 4000\$	0,00%	<ul style="list-style-type: none"> • Baffling complexity of counterfeit • Lack of direct contact with equipment 	<ul style="list-style-type: none"> • Complexity in reading • Unsteadiness of identification parameter • Complexity of algorithm of identification • Discomfort of the thought about detrimental effect on the eyesight
Geometry of the face	From 100 \$	5,00%	<ul style="list-style-type: none"> • Possibility of persistent verification • Lack of direct contact with equipment • Habitualness in use 	<ul style="list-style-type: none"> • Illumination dependence • Dependence on the variation of the head position • Does not distinguish twins

CONCLUSION

Apparently from the table 1 the equipment that can take biometric parameters of a person can be of high price. High school can give expensive equipment for the period of training in SDE but even for high school it can be impossible because of high cost of devices.

From the data cited in the table it is possible to allocate two most spread technologies that can be found nowadays: biometric identification with use of papillary pattern of a finger (print) and iris. However, some factors of biological features

according to which identification of a person is made can change. For example, deformation of papillary pattern of a finger (print) is possible if there are some cuts and burns, therefore, frequency of refusal to a person in access which has right for it while using one-factorial identification in biometric systems is great enough. This problem can be solved if to use multifactorial identification when identification of a person is made according to several identifiers simultaneously, for example, according to the fingerprint and iris simultaneously. In this case reliability of the system improves and probability of an error of identification decreases. But use of multifactorial identification increases cost of equipment and as consequence training in SDE increases too.

Considering features of receiving biometric parameters percent of errors in verification and complexity of used algorithms it is more reasonable to use those devices and means of identification in SDE that require minimum financial expenses at high accuracy identification and which do not constrain use of a concrete operating system.

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ОБОСНОВАНИЕ ВЫБОРА РЕШЕНИЯ ПРОБЛЕМЫ ИДЕНТИФИКАЦИИ ТЕСТИРУЕМОГО В СДО С ПОМОЩЬЮ СНЯТИЯ БИОМЕТРИЧЕСКОГО ПОКАЗАНИЯ ЕГО ЛИЦА

Дядичв В.В., Капуста Л.В., Вашенко В.Ю., Литвиненко А.М.

Аннотация. В данной статье рассмотрены проблемы фальсификации знаний слушателями системы дистанционного обучения, а также предложены возможные пути решения данной проблемы и сделано обоснование выбора идентификации пользователя данной системы по биометрическим показаниям лица.

Ключевые слова: идентификация, система дистанционного обучения, дистанционное обучение, фальсификация знаний.